

Sweeteners . . . 22

National Honey
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SEP 2003

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Honey wannabe's abound. There are more sugars and sugar substitutes in heaven and earth, Horatio, than are dreamt of in your philosophy. And they all want to be honey. Find out all about other sweeteners in this Bee Culture Exclusive on page 22. (With apologies to Shakespeare, Hamlet [I,V].) (photo by Kim Flottum)

**MAILBOX - 5; AUGUST HONEY PRICES - 12;
GLEANINGS - 49; CLASSIFIED ADS - 53**

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Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

SEPTEMBER 2003 VOLUME 131 NUMBER 9

FEATURES

SWEETENERS **22**

A Bee Culture Exclusive

There's all manner of things that are sweet, including honey. Find out about those you know, and those you didn't know existed. This year start a counter-revolution.

James Fischer

THE NATIONAL HONEY SHOW **33**

The 'Super Bowl' of Honey Shows takes place in London, in November

Gladstone Solomon

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Scott Holisky

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A Bee Culture Exclusive

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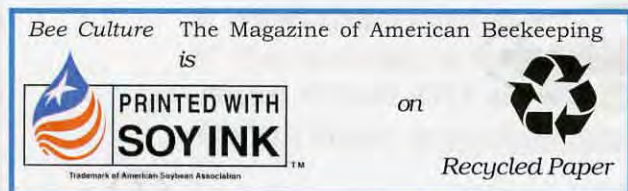
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Ann Harman



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From Our Authors . . .

Past & Present

Mark Winston

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MAILBOX

Decoy Hives

I would like to respond to a letter in the July issue of *Bee Culture*.

It was written by Dr. Richard Taylor concerning feral bee colonies and mite resistance. In the last 30 or 35 years I have also put out bait hives (I always called them decoys), but no matter what they're called they're put out to capture swarms and they work quite well. I've tried pheromone lures once without old drawn comb. They didn't work as well as old comb, but it was only a couple of hives, so it probably wasn't a good test, but I'll stick with old comb. It's cheaper. I'm kind of a purest like I imagine Dr. Taylor is.

In the last 35 or so years I've caught hundreds of swarms using decoys. Back in the pre-mite days, if I put out 10 decoys in April I would be guaranteed 10 swarms by the 4th of July. It was just that simple.

Since the mite it's been harder, but the last couple of years have been better.

It got so bad in the early 90s that I about gave up. But then I started putting decoys at the cranberry bogs, where the pollinators brought in about 1100 hives. I did pretty good, but the bees weren't real good honey producers even though they built up tremendous colonies, and were quite gentle. They didn't seem to produce, so I went back to the old way and started picking up swarms again. It seems as if the swarms were smaller in size than I remembered and if I did get a big prime swarm in May they would cast a swarm in late June or July. I never had this happen before.

I have more fun with decoys than I do collecting honey.

James Cowan
Aberdeen, WA

Importing Bees

I would like to comment on Dr. Mark Winston's article "Leaving on a Jet Plane" in the July issue of *Bee Culture*.

In his usually informative and entertaining style, Mark's thesis on the reasons to limit future importations of honey bees into the U.S. seemed quite reasonable. However, I found his explanation of the importation of Buckfast bees into the U.S. and Canada to be at variance with my own experience and knowledge of the matter.

During the 80s and early 90s, I was in contact with Brother Adam as well as Dr. Shimanuki at the Beltsville Lab regarding importation of Buckfast queens into the U.S. which finally occurred in 1990 and 1992. All live bees had to be sent through quarantine, in this case at Baton Rouge, before being distributed to beekeepers. USDA used some of those queens as breeders for developing tracheal mite (HBTM) resistance in U.S. stock, but since the Buckfast line is proprietary, the Buckfast name was dropped. Remaining queens were given to Weaver Apiaries as they were the sole authorized Buckfast outlet in the U.S. Prior to 1990 when breeders were sent to the USDA to produce second-generation queens, as mentioned previously, and 1992 no live Buckfast queens were sent to the U.S. with the exception of 1968 when Brother Adam sent Roy Weaver a few then to start the Buckfast line in the U.S. All Buckfast stock in the intervening years and since 1992, has been maintained through importation of drone semen for artificial insemination.

Although I have not seen statistical data confirming the fact, I have observed that the significant development of HBTM resistance in U.S. bee stocks has followed the 1990 and 1992

Buckfast Importations, particularly through the "generic" distributions by the USDA.

My knowledge of Canadian importations is less specific, but I remember that prior to 1992 beekeepers in Ontario and at the University of Guelph were also very interested to import live Buckfast queens to help bolster their HBTM resistance in Canadian stock. Prior to that time, they had been able to import ripe queen cells, which were much less predictable and reliable in terms of "breeding true." Today Canada has several authorized breeders of Buckfast stock.

I would suggest that the parallels between various types of resistance to various problems such as HBTM, *Varroa*, etc., are not quite as clear-cut as Mark's article suggests. The current situation with *Varroa* resistance is a good example of finding the most promising results through closed population breeding particularly with Dr. John Harbo's work with SMR stock. I think it's still too early to say that the main mechanism for *Varroa* resistance is through selection for hygienic behavior.

However, I can say from experience that the development of tracheal mite resistance in North America seems to owe a lot to the introduction and importation of Buckfast bees into our countries. I would suggest that we need to maintain strict import and quarantine controls on live honey bees, but that we also should allow enough flexibility in regulations to get new stock here when necessary.

Allen Summers
Longmont, CO

Healthy Nuts 'N Honey?

The Food & Drug Administration has their hands full cracking down on false and misleading



INNER COVER

There's something, I'll bet. Something that gives you that "Doggone, lookit that, I did a pretty good job, if I do say so," feeling. Right?

Maybe it's a just-painted garage, all the trim and all the rest. "Makes everything look better, don't it?"

A lot of people, me included, like that just-mowed lawn look. "Gives the place a little class when it's just done and it smells good too."

Fixing the carburetor on a '54 Chevy so it just absolutely purrs is one, and so is buffing the third coat of finish on your mom's old dresser, so your children can keep a bit of Grandma, and a bit of you around when you're gone.

Even something as simple as the perfect bacon, lettuce and tomato sandwich – hot, not-too-crispy bacon; a just-picked-still-sun-warm-perfectly-ripe sliced tomato (almost too juicy for this, but it'll be worth the mess); cold, crisp lettuce; fresh-with-no-preserved bread toasted just barely tan, but a little crunchy; and half a pint of Miracle Whip®. All timed to the second. If you can make one of those, maybe only you will benefit, but it's worth a (short, before it gets cold or soggy) moment of perfection reflection. Go ahead. (Please disregard any poor-health claims made by the fanatics in the room and don't dare share a bite if they kick up a fuss.)

For some, it's a perfectly made frame. Or maybe the invention of an assembly line technique that speeds the process but doesn't take away the perfect-finish feeling at the end. Wood smell and tools and isolation – all in one task. "It doesn't get much better," I've heard a hundred times.

Eight foot tall stacks of brand new, clean-cornered, just painted supers is a satisfying day for a lot of us, but so is a healthy, 20 colony beeyard that's just been mowed and weed-whacked.

"Good enough for the cover of that magazine" is exactly right. It is good enough, and it doesn't matter a whit whether you have your camera or not. You know.

Whatever it is, it's what keeps us getting up in the morning. It's selfish, but that's O.K., because you're not 'taking' anything from anybody. And a lot of times it's something you can share (except maybe that BLT).

But I gotta tell you. Going through all the fal-der-al of making the aforementioned frames and stacks of supers is *not* on my list of things I do to feel good. It was one time. The first time, which was also the last time. Been there, done that. Doing the dishes offers more satisfaction than pounding together supers, and root canal and frames *can* be used in the same sentence.

So it is with unbridled enthusiasm that I embrace, at long last, the reality of "preassembled."

Actually, the "What goes around, comes around" concept applies here, because way back when, frames and supers were sold assembled. Ready to go. Even painted. What a concept.

But then ole' A.I. Root put his thinking cap on, and figured out that you could get a whole lot more in a box car to California knocked down and "unassembled," than "preassembled." That immediately

became the standard. And for 130+ years, that stayed the standard. Everybody did it. Most everybody still does.

Assembling equipment correctly became a passage for beginning beekeepers. Books were written about the subtlety of advanced construction and assembly, and absolutely every beginner's book has a chapter on how to put all the blame things together. It's mandatory.

If you advocate this notion of 'preassembled' you will be attacked from all sides by those who still believe that the old way is the best way. Traditionalists will have you believe that if you don't comprehend, and assemble, the basics of beekeeping, you simply aren't a beekeeper.

Balderdash!

A wired deep frame with a split bottom has six pieces (top bar, two end bars, split bottom and wedge), plus wire, 10 nails, six eyelets and glue. That's 23 'things' plus glue. Even frames with plastic foundation have four pieces plus the sheet of plastic, plus 10 nails or six staples.

And that's only one.

Good grief!

I didn't put my car together. Or my couch, washing machine or computer. In fact, what other 'thing' do you have to put together that has 23 pieces? Or 238 (not counting I don't even know how many nails), if you want to consider a *single* do-it-yourself super? Name one thing. Bet you can't. And you still have to paint it. Twice.

"Well, I gotta be doing something in the slow season" is the argument. Makework is all it is, is what I say.

Nope. I just don't get it. Wood smell, tools and isolation aren't on my list.

I'll tell ya, though. I do know that perfection reflection moment. And I suppose if it's frames and stacks of supers, more power to you.

But give me preassembled. Everyday.

Continued on Page 59

Perfection Reflection

MAILBOX

health statements on food products and dietary supplements.

When a product can provide good evidence to back a health statement, however, the FDA is more amenable. A case in point: the FDA recently allowed the statement "Scientific evidence suggests but does not prove that eating 1.5 ounces per day of most nuts as part of a diet low in saturated fat and cholesterol may reduce the risk of heart disease" on packages of certain nuts, including almonds. (See the Almond Board of California website www.almondsarein.com for further information.)

Allowing this statement was "the result of rigorous review of a large body of scientific research citing the health benefits of nuts" and "though there is enough evidence to support this claim, the evidence is not conclusive."

The Almond Board provided the FDA with these studies.

(Incidentally, the Almond Board, composed of almond producers, survived a "free speech" attack by some dissident members a few years back; the Board has apparently made itself "bulletproof" from future attacks. Had the Almond Board been disbanded, it is unlikely that the health studies provided to the FDA would have been carried out.)

There are probably 10 times as many studies on the health benefits of honey as there are on the health benefits of almonds. The International Bee Research Association (IBRA) has cataloged most of these studies (at no cost to beekeepers) as has the National Honey Board (including recent studies initiated by the NHB).

Surely the time has come for a health blurb on honey containers. The blurb could be as innocuous as "honey has been proven to have anti-bacterial properties" or could be more detailed.

Joe Traynor
Bakersfield, CA



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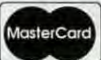
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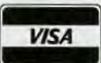
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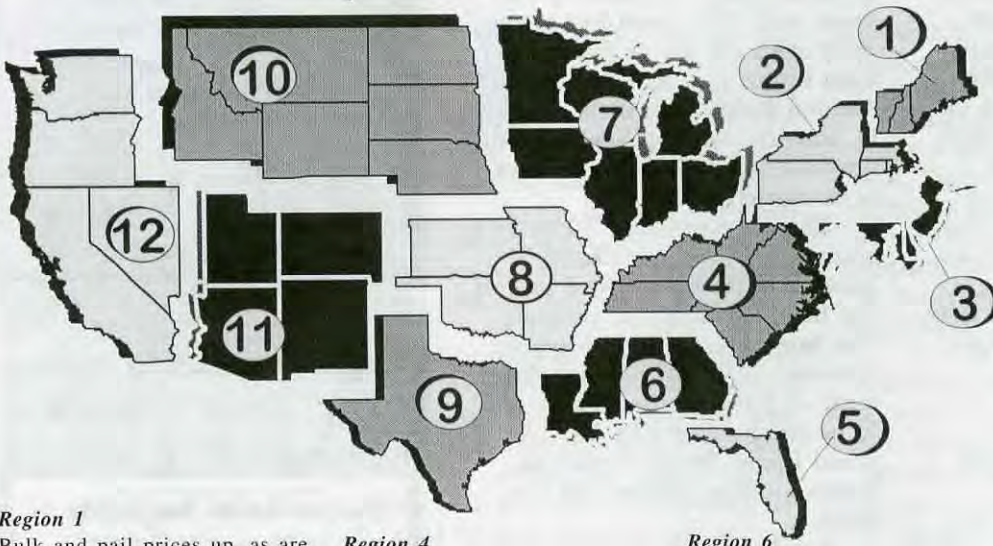
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SEPTEMBER - REGIONAL HONEY PRICE REPORT



Region 8
Pails and bulk prices up, wholesale steady, but retail prices down since last month. About average crop across the region, but spotty, to be sure. And most of it's light.

Region 9
Bulk prices up this month, but everything else is down. Crop not too bad, but slow spots exist. Light amber is the key word.

Region 10
Bulk prices up, pails steady, but wholesale and retail prices down. So is the crop. Light and light amber is what there is.

Region 11
Bulk steady, pails up, wholesale and retail down. Crop spotty, but most places, and reporters, have reduced crop this year. Light amber abounds.

Region 12
Prices up across the board this month. A welcome change. Crop average across the region, but north and south on different planets as far as production goes. Very, very spotty.

Region 1
Bulk and pail prices up, as are wholesale prices. Retail, though, down since last month. Mixed crop so far, mostly light amber.

Region 2
Bulk and pail prices steady, retail and wholesale down since last month. Crop average to down to way below average, and mostly light amber.

Region 3
Bulk and pail prices up from last month, while wholesale and retail holding steady. Mixed crop production so far, and mostly darker honey produced.

Region 4
Bulk prices steady, pails up, but wholesale and retail prices rock steady since last month. Production steady to down on average, with more lighter honey than darker produced.

Region 5
Pails and bulk prices up this month, wholesale steady and retail prices down. Production down this year, and color, interestingly dark, or light but little in between.

Region 6
Bulk down, pails up, wholesale steady but retail up since last month. Light and dark honey being produced, but not very much anywhere, it seems.

Region 7
Bulk prices down, but everything else steady. Production mostly down, but some hot spots exist - though not many, and it's all, or mostly light.

	Reporting Regions												Summary		History		
	1	2	3	4	5	6	7	8	9	10	11	12	Range	Avg.	Last Month	Last Yr.	
Extracted honey sold bulk to Packers or Processors																	
Wholesale Bulk																	
55 gal. Light	1.25	1.59	1.45	1.25	1.43	1.37	1.53	1.45	1.45	1.54	1.30	1.25	1.25-1.59	1.40	1.34	0.91	
55 gal. Amber	1.27	1.10	1.27	1.14	1.20	1.21	1.49	1.27	1.15	1.30	1.38	1.10	1.10-1.49	1.24	1.19	0.83	
60# Light (retail)	85.50	90.44	105.31	92.83	105.31	95.50	102.00	105.00	100.00	87.50	149.00	105.31	85.50-149.00	101.97	97.62	76.51	
60# Amber (retail)	101.33	89.25	94.26	88.55	94.26	92.50	96.75	92.50	94.26	80.00	119.00	94.26	80.00-119.00	94.74	90.93	71.56	
Wholesale - Case Lots																	
1/2# 24's	40.23	32.58	39.85	35.08	39.85	32.50	33.51	39.85	39.85	35.76	38.15	39.85	32.50-40.23	37.26	40.76	34.58	
1# 24's	59.45	44.66	56.00	50.76	55.60	51.00	53.76	53.47	50.40	66.48	72.00	72.00	44.66-72.00	57.13	56.73	49.33	
2# 12's	52.51	41.39	54.00	47.20	60.48	43.00	55.99	60.00	46.50	57.84	28.00	60.00	28.00-60.48	50.57	51.15	43.94	
12 oz. Plas. 24's	48.22	39.90	27.00	39.44	41.91	45.00	43.99	44.07	43.20	49.02	48.00	54.00	27.00-54.00	43.65	49.27	44.69	
5# 6's	55.28	45.29	54.74	50.85	54.74	60.00	50.39	50.00	54.74	61.26	27.00	66.00	27.00-66.00	52.52	60.39	48.86	
Quarts 12's (NEW)	32.00	72.00	78.00	62.86	72.01	81.33	75.82	69.60	72.01	91.44	77.40	84.00	51.80-91.44	72.37	72.46		
Pints 12's (NEW)	32.00	37.35	44.27	36.06	44.27	49.33	46.74	42.00	40.00	60.06	40.25	48.00	32.00-60.06	43.36	44.34		
Retail Honey Prices																	
1/2#	2.19	1.90	2.92	2.04	2.29	2.65	2.81	2.22	2.92	2.72	2.49	2.92	1.90-2.92	2.51	2.45	2.02	
12 oz. Plastic	2.80	2.53	2.95	2.71	2.90	2.63	2.84	3.29	3.25	3.08	2.86	3.19	2.53-3.29	2.92	3.06	2.43	
1 lb. Glass	3.35	2.94	3.50	3.51	3.16	3.89	3.54	4.11	4.00	3.90	4.08	4.19	2.94-4.19	3.68	3.74	2.96	
2 lb. Glass	5.82	4.89	5.50	6.45	6.25	5.92	5.74	6.27	5.63	6.49	6.09	6.39	4.89-6.49	5.95	6.15	4.85	
Pint (NEW)	5.50	4.50	4.99	4.30	3.19	4.17	5.53	5.47	4.95	7.17	5.20	6.00	3.19-7.17	5.08	5.35		
Quart (NEW)	7.38	7.75	9.50	6.71	5.99	9.33	9.97	8.54	8.50	11.59	8.47	10.00	5.99-11.59	8.64	8.78		
5 lb. Glass	13.25	10.22	15.03	12.61	10.00	13.25	13.30	15.19	15.03	13.59	10.96	14.00	10.00-15.19	13.03	14.19	9.50	
1# Cream	4.20	4.33	4.77	4.12	4.77	3.75	4.09	4.60	5.00	4.55	4.57	4.77	3.75-5.00	4.46	4.41	3.71	
1# Comb	4.95	4.04	3.95	4.50	5.20	4.40	4.88	4.24	5.20	6.00	27.00	5.20	3.95-27.00	6.63	5.00	5.84	
Ross Round	3.50	3.55	3.60	4.82	3.87	3.75	4.50	4.35	3.87	6.00	5.67	3.87	3.50-6.00	4.28	4.13	4.06	
Wax (Light)	3.35	3.05	3.00	1.48	1.20	2.40	1.56	1.50	3.11	2.25	1.85	3.11	1.20-3.35	2.32	2.98	2.72	
Wax (Dark)	3.25	2.73	2.75	1.38	1.10	2.02	1.20	1.00	2.30	2.30	1.15	2.30	1.00-3.25	1.96	2.51	2.57	
Poll. Fee/Col.	47.00	41.00	34.00	36.75	30.00	42.50	40.14	40.00	39.91	39.91	27.00	35.00	27.00-47.00	37.77	37.58	40.83	



Mark Winston

Apples & Honey

“There is another September happening that is even more important to me, and ties together all of my September moods into a coherent whole.”

September has always been one of my favorite months, a time of harvest and change. Fruit from heavily laden trees are ripe for eating, bottling, and canning, the last of the garden produce is enjoyed, and we begin preparing orchard and farm for the upcoming Winter and subsequent rebirth in the Spring.

I have spent virtually my entire life in school, as student and professor, and so September also brings for me the inevitable end to Summer break and the beginning of the school year. I turn from our Summer research agenda to welcoming eager incoming students beginning the process of challenging, inspiring, and learning from a new batch of pupils.

September also is an important beekeeping month, the final opportunity for colonies to bring in the last dribs and drabs of Fall honey. For we beekeepers September means Fall management time, and we initiate the feeding, medicating, and manipulating that will prepare our bees for the long Winter ahead.

There is another September happening that is even more important to me, and ties together all of my September moods into a coherent whole. The Jewish holidays of Rosh Hashanah and Yom Kippur happen in September or early October, festivals of renewal and reflection. They also are holidays where bees and honey play a prominent role.

Like most religions, Judaism has practices and beliefs that seem internally coherent but appear odd to outsiders. Rosh Hashanah, for example, is the Jewish New Year, but it occurs at the beginning of the seventh month rather than the first. Our first-month-of-the-year new year happens in Spring, which makes sense, but the official religious new year is in the Fall, reflecting the importance of that season for rededication to our personal and religious ideals.

Our holidays also begin at sundown, creating annual confusion on the part of the uninitiated who look at sectarian calendars that list the first day of our holidays rather than the night before as the start. Why start a holiday at sundown? Many reasons, but it usually means beginning festivities with a large meal, and what could be wrong with that?

Rosh Hashanah is a joyous day, but it precedes a more somber and reflective 10-day period that leads to Yom Kippur, our Day of Atonement. We consider the past year behind us and the year to come during these 10 days, atoning for any misbehavior and asking forgiveness from those we have wronged. Jewish tradition tells us that our fate for the coming year is written into the proverbial Book of Life during this time, for better or worse, but sincere repentance between Rosh Hashanah and Yom Kippur will soften any harsh judgements against us.

Yom Kippur is followed by the week-long holiday of Sukkot, a time

when we sleep outdoors in tent-like dwellings with thatched roofs. This was primarily a harvest festival in ancient times, and still evokes the rhythms and feeling of harvest time for celebrants today.

These holidays have common themes and practices, particularly a ritual where slices of apple are dipped in honey and eaten. After dipping but before eating we say a prayer: *May it be your will, Lord our God and God of our ancestors, to renew this year for us with sweetness and happiness.*

This ritual is repeated before numerous celebratory meals throughout the holiday period, and has deeper meaning for me than for most Jews because I recognize the connection between bees, honey, and apples. Indeed, the simple rhythm of blessing, dipping, and merging apple and honey holistically unites my own disparate identities of beekeeper, scientist, teacher, and Jew. It is at these moments that I feel most whole, and at these times of celebration that I most deeply understand the role of bees in nature and in my own life.

Beekeepers and apple growers can most fully appreciate the profound symbolism of dipping a slice of apple into a bowl of honey. Apples would not exist were it not for the pollinating influence of the bees, which transfer pollen between flowers every Spring, setting the seed for the apple fruit.

The apples, for their part, produce sweet nectar in their flowers which attract the bees to dip their

Continued on Next Page

“Yes, there is much that can be revealed when the taste of crunchy apple is mixed with the sweetness of honey.”

tongues deep into the flower, knocking pollen off the flower onto their hairy bodies in the process of imbibing.

The pollen rubs off on subsequent floral visits, fertilizing the flowers, and the life and growth of the new apple fruit begins. The nectar from the apple flowers is carried back to the bees' nest, turned into honey, and stored for the Winter, providing the honey bee colony with the energy it needs to survive until the next Spring, when the cycle is renewed as the bees pollinate again.

Thus, we recognize this annual cycle, one depending on the other, by joining the apple and honey together to renew the sweetness of the seasons.

This closely intertwined relationship has even deeper meaning, however, because the quality of the apple depends on the number of bee visits. The more bees that visit each flower, the larger and rounder the fruit. Of course, the donor and recipient trees are not the same, and must be different varieties to mesh well.

In a similar way, it is the cross-fertilization of ideas and communal worship that draw us together to celebrate in our homes and synagogues. We derive strength and wisdom from our mutual visions, just as the apples are improved by the visits of the bees and the transfer of diverse pollen.

The circular nature of bees pollinating, fruit setting and ripening, and seeds from the fruit leading to future plants and flowers is echoed in other rituals. We normally eat a braided bread, called challah, weekly on the Jewish Sabbath, but during the new year holidays the challah is round, and baked with honey and raisins. The round challahs emphasize the roundness of our earth and the cycle of the seasons, intertwined with our hopes for sweetness in the upcoming year.

These circular symbols from the

bees and the apples transform a simple holiday ritual into a profound expression of our desire to atone within a community, merging our individual concerns and aspirations with those of our friends and neighbors. It is an intensely social experience, reflecting the way a bee colony melds individual actions into those conducted for the good of the colony.

These and other rituals can be taken superficially as a pleasant holiday tradition “for the kids,” or considered more acutely as a tool to delve deeper into reflections about our own behavior and our place in the world. Those of you who are not of a religious bent might scoff, but there is an important role of ritual in all of our lives, whether secular or faith-based.

I, for example, change in subtle ways when I put on my beekeeping vestments. Slipping my pants into my boot tops, putting on a bee suit, tying up my veil, lifting my hive tool, these are all routine activities imbued with deeper meaning because they herald a transition from what-

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ever I had been doing into bee-visiting mode.

I also use icons during my bee-attending, symbols that connect my beekeeping past and present. My most treasured symbol is an old blue backpack that I used while studying Africanized bees in South America nearly 30 years ago, and which still contains all of my personal gear.

It's an old pack, ripped in places, with an embroidered fabric panel from Panama sewn into the pack's fabric. This panel or mola was a present given to me by well, let's just leave that one as a memory. Inside my pack are rolled-up pieces of cardboard for smoker fuel, a few queen cages, gloves if I need them, a handy jar of pheromone-impregnated vaseline, twist ties, and innumerable other gizmos and gadgets accumulated during decades of visits to the beeyard.

Hefting my pack and walking into the yard is a moment totally in the present, but also one connected to innumerable visits to beeyards around the world, with memories of so many friends and fellow beekeepers who shared long days with our bees.

My pack evokes travel and adventure, long periods of tedium, and a few glimpses of wisdom. It opens those too-few and brief moments of understanding when the marvelous complexity of our usually unfathomable natural world was revealed, moments whose memory can still take my breath away.

I think of my pack, my friends, and my bees when I dip my New Year's apple into honey, and much more. The feel and smell of the beeyard is right there with me, connected with the cycles of the seasons and the profound beliefs and history from which my own rituals descended, and hopefully which my descendants will learn from and enjoy.

Yes, there is much that can be revealed when the taste of crunchy apple is mixed with the sweetness of honey. But isn't it always like that, with wonder all around us when we open our eyes to the profound insights imbedded in the simplest of pleasures? **BC**

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

National Honey Month

21 Ways To Sell More Honey



Malcolm T. Sanford

**"Recommendations that will sell more of your honey this season.
Read and absorb."**

Veteran marketers know that as Fall ushers in cooler weather, honey sales usually pick up. This is one reason that September is National Honey Month. That's not to say there isn't competition. It also happens to be National Chicken Month, National Rice Month, National Mushroom Month, National Piano Month, and improbably, National Pediculosis Prevention Month. As syndicated humorist Dave Barry would say, "I am not making this up."¹

The World Wide Web has an actual site called "National Honey Month."² Here's what the author Louise says, "Tasmania. I bought Real Leatherwood Honey from the Australian Catalog a few months back. The labels says R. Stephens, Mole Creek Tasmania, Australia. I'm saving it for a special occasion. If I were better with words, I would describe the golden color that is reflecting toward me right now as I have to resist just twisting the lid off the jar and getting my sticky little fingers in it. On my last visit to Virginia, I picked up Unfiltered Summer Thistle Honey from Golden Angels Apiary, Singers Glen, Virginia. I am so glad the address is on the label. I need more more....The Lavender Mint Herbal Honey from Mountain Meadows tickles my senses and my throat. Now when would anything bee related tickle? It really does. When I'm feeling especially sluggish or under the weather, I seek the Blue Ridge Mountain honey of Virginia. Their Lavender Mint honey is 'seasoned with a sprig of lavender mint and a zest of orange.' Now tell me that doesn't touch the heart of you? Knowing my desire to sip every flower of honey I can get my little taste buds on, John and Luna, you remember them they are my son and my daughter-in-law, gleefully surprised me with a jar of Amaretto Whipped Honey Spread. Have I tried it? No. Why? Well, your not going to believe this, but I just can't figure out on/with what. Anyone have any suggestions?"

Recent conclusions by studies commissioned by the National Honey Board reinforce Louise's comments.

Her remarks especially confirm that consumer awareness of honey is limited, but sampling sparks strong interest and creativity for expanding honey use and purchase. In addition, users need awareness, recipe/use suggestions, and product availability to encourage purchase of varieties. There is no better time to put into place these recommendations than National Honey Month.

The first study by Jeffery B. Ross of Marketing Research³ is entitled: "Honey Attitude & Usage Study - 2002" was published October 5, 2002. The second, by Snell Associates, "Qualitative Exploration of Honey Among Consumer Segments," was released the following month. The market place segments identified are African American, Hispanic and Caucasian.

Conclusions from both studies are summarized in the National Honey Board's publication, "Making Honey Stick With Consumers," March 2003.⁴ Billed as the first in a series of marketing tools prepared for honey industry professionals, the publication urges marketers to consider the basics: "To market honey, you need to make a connection to consumers who want to buy it. The connection in most cases is through retail stores. Therefore, it's important to stay fresh on consumer and retail trends." The results and conclusions are appropriate to review, especially for National Honey Month.

Major implications from a survey of more than 800 people, the publication says, reveal that four out of five households currently have honey in their cupboards, and they use it a little more often than once a week, primarily on toast, biscuits, muffins, cornbread. It is also used as an ingredient in recipes and for sweetening tea. Nielsen data suggest that only 27 percent of households have purchased honey during 2001, meaning that perhaps as many as one-half of "current users" have honey in their homes purchased over a year ago. The publication concludes: "This information shifts our marketing focus from introducing honey to

1. Oklahoma Ag in the Classroom, Oklahoma State University World Wide Web site, accessed July 16, 2003 <<http://www.clover.okstate.edu/four/aitc/calendar/sept.html>>

2. Louise's World Wide Web site, accessed July 15, 2003 <<http://members.aol.com/acalendar/September/honey.html>>

3. Jeffery B. Gross World Wide Web Marketing Research World Wide Web site, accessed July 17, 2003 <<http://www.grossresearch.com/food.htm>>

4. National Honey Board. 2003. Making Honey Stick with Consumers: Marketing Information for Honey Industry Professionals.

new consumers to extending usage by existing consumers."

Recommendation #1: IN-STORE SAMPLING OPPORTUNITIES CAN BRING HONEY BACK TO TOP-OF-MIND WITH ALL CONSUMERS AND BREATHE SOME ACTIVITY/EXCITEMENT INTO THE CATEGORY.

Specific audience segments included in these studies are current users, past purchasers and non-purchasers. These are broken down into ethnicity, activities, sweeteners in the home, education and household income. Current users were a little bit older (48-years-old), compared to past purchasers (45-years-old) and non-purchasers (42-years-old). Current users include all ethnic groups, whereas predominantly Caucasians constituted past and non-purchasers. All groups were found to be active in BBQ and grilling, physical exercise, fitness/exercise and travel, but watching sports on TV was more predominant in non-

"#4 New Packaging With NO MESS Spout."

purchasers. Current users had honey and maple syrup in the home along with granulated (white and brown) sugars possessed by all groups. But neither maple syrup nor honey were found in appreciable amount in the homes of past- and non-purchasers. Current users had higher incomes and more education than the other two groups.

General observations of the above groups produced the following:

Recommendation #2: PROMOTE HONEY IN BBQ/GRILLING SAUCES WITH APPROPRIATE PARTNERS THROUGH IN-STORE DEMONSTRATIONS AND DISPLAYS.

Recommendation #3: GENERATE MORE PRESENCE ON THE WEB THAT WILL MOTIVATE RETAIL PURCHASE.

Recommendation #4: CONSIDER NEW PACKAGING WITH NO-MESS SPOUT OR OTHER INNOVATION.

Recommendation #5: CONSIDER INTRODUCING NEW HONEY VARIETIES THAT ARE LESS SWEET OR HAVE DIFFERENT FLAVOR PROFILES.

Based on key issues found from the attitude and usage study, focus groups were established for Caucasians, English-speaking Hispanics, Spanish-speaking Hispanics, and African American males. In general these groups viewed honey as a commodity that was 100% natural. They had few concerns about purity. Honey use stems largely from family tradition. The sweet's only drawbacks are its inherent messiness or stickiness and the tendency to crystallize for which many don't have a remedy. Finally, consumers are interested in learning more about honey use via recipes, especially its health, cosmetic and therapeutic benefits. Thus,

Recommendation #6: IT IS VALUABLE TO EXPLAIN THE POSITIVE QUALITIES OF HONEY TO GENERATE LOYALTY.

Recommendation #7: THE QUALITY OF THE HONEY SUPPLY MUST BE SAFEGUARDED.

Recommendation #8: BESIDES PACKAGING INNOVATIONS, HAVE ON-PACK INSTRUCTIONS ON LIQUEFYING CRYSTALLIZED HONEY.

Recommendation #9: PROMOTE THROUGH RECIPES AS WELL AS NON-TRADITIONAL USES. CONSIDER PLACING HONEY DISPLAYS DURING THE COLD AND FLU SEASON WITH RELEVANT PARTNERS AS SOOTHERS FOR SORE THROATS, OR PLACE HONEY IN THE COSMETIC/MOISTURIZER AISLE WITH OTHER KEY INGREDIENT PARTNERS.

For African American men, honey use is traditionally based, generally arising from Southern or ethnic cooking. Its use for sore throats is common and adults use it in hot toddies.

Recommendation #10: FOR STORES WITH AFRICAN AMERICAN CLIENTELE, CONSIDER PROMOTING WITH RECIPES THAT FEATURE SOUTHERN COOKING TRADITIONS SUCH AS CORN BREAD AND BBQ SAUCES. ALSO CONSIDER DISPLAYING HONEY WITH RELEVANT PARTNERS SUCH AS TEA DURING COLD AND FLU SEASON.

Perhaps the most loyal honey market consists of Hispanics, especially those who retain their Spanish language and culture. Price is not a barrier. More significant to this market is honey in the comb, which is considered a treat. English-speaking Hispanic women share the same basic beliefs, but they are tempered by U.S. tradition, which minimizes use of comb honey and maximizes using the sweet as topping and ingredient.

Recommendation #11: FOR STORES THAT CATER TO A HIGHER PERCENTAGE OF SPANISH-SPEAKING HISPANIC CONSUMERS, CONSIDER PROMOTING HONEYCOMB IN CONJUNCTION WITH MEXICAN FOOD RECIPES AND HOLIDAY TRADITIONS. PROVIDE SPECIFIC IDEAS USING SIMPLE MEXICAN-STYLE STAPLES SUCH AS TORTILLAS.

Caucasian women are more concerned with using honey as a food than medicine and are looking for packaging options to make their life easier:

Recommendation #12: GREATER OUTREACH TO CHEFS AND SERIOUS COOKS COULD GO A LONG WAY IN EXTENDING THE PREFERENCE FOR HONEY.

Recommendation #13: PACKAGING INNOVATIONS, IN-STORE PRODUCT DEMONSTRATIONS, AND ESPECIALLY EASY RECIPES WILL INCREASE PURCHASE INTENT.

Interviews with retailers showed that those selling more honey said it was because of increased demand, new customers and more time dedicated to in-store activities.

Recommendation #14: EVEN A COLOR CHANGE ON THE LABEL CAN CREATE NEW APPEAL ON THE SHELF.

Recommendation #15: INVESTIGATE NEW NO-MESS ENCLOSURES AND OTHER PACKAGING DESIGN INNOVATIONS.

Recommendation #16: THINK ABOUT HONEY ON DISPLAY IN THE BEAUTY AND OTHER SECTIONS OF A GROCERY STORE OR IN THE PRODUCE SECTION WHERE HERBS ARE SOLD WITH RECIPES FOR INFUSED HONEY.

Finally the publication concludes that there are five consumer trends that must be considered to drive honey sale growth: convenience, health and wellness, Hispanic focus, food is everywhere, and online spending.

Recommendation #17: DEVELOP EASY NEW USES FOR HONEY THAT WILL ENHANCE RECIPES AND MEAL PREPARATIONS WITHOUT EXPENDING MORE TIME OR ENERGY. FOCUS ON THE CONVENIENCE ASPECT OF HONEY IN EVERY DAY LIFE.

Recommendation #18: MAKE SURE TO CONTINUE TO SHOWCASE HONEY'S GREAT ATTRIBUTES. RECIPES AND EVEN ENERGY-BOOST DRINK RECIPES WOULD BE PERFECT TO BRING HOME THE POINT.

Recommendation #19: THE HISPANIC BASE IS ONE OF THE MOST LOYAL CUSTOMER BASES. CONSIDER IMPLEMENTING DISPLAYS FOR THAT SEGMENT.

Recommendation #20: THINK ABOUT DISTRIBUTION OF HONEY IN NON-TRADITIONAL CHANNELS LIKE SPORTING GOODS STORES, CONVENIENCE OUTLETS AND EVEN COSMETICS COUNTERS.

Recommendation #21: ON-LINE VISIBILITY IS CRITICAL FOR CAPTURING THE YOUNGER AUDIENCES AND KEEPING THE PRODUCT CURRENT AND RELEVANT. WORK TO GET ON WEB SITES AND CREATE LINKS TO OTHER HONEY PAGES.

The National Honey Board has taken the last piece of advice to heart. It will no doubt have a blizzard of publicity ready for this year's celebration of National Honey Month on one of its two celebrated World Wide Web sites.⁵

Beekeepers can also use their own creativity. Like beekeeping practices, there are many ways to celebrate National Honey Month as there are advocates. School visits come to mind as do honey moon promotions. A recent innovation is to send an electronic greeting card. Right now you can mail a National Honey Month electronic card for free to aficionados and others.⁶ I recently sent one to this magazine's editor; it became the inspiration for the title of this column. **BC**

5. See World Wide Web sites <<http://www.nhb.org>> and <<http://www.honey.com>>.

6. Electronic greeting card World Wide Web site, accessed, July 16, 2003 <<http://www.egreetings.com>>.

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

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Bee Culture's Beeyard

A Queen Cage Introduction Frame

Beekeeper gadgets

If you have been in beekeeping longer than fifteen minutes, you already know that beekeepers love gadgets. Hundreds of times, upon looking at a particular piece of equipment, I have heard beekeepers say, "I can build that!" With this particular piece of equipment, you could build one for those special queen introduction events or you could build enough to leave one in your colony permanently. By leaving it in the colony, the comb would be drawn out and ideally even have brood in it, thereby positioning the new queen near brood and nurse bees.

This frame, having a thick modified top bar, has a slot in which you can put a queen cage without having to remove a frame or bother trying to tie or stick the cage on the comb. The modified top bar has a second shallow slot that allows you to put the cage in the frame with the screened side down, should you desire. Finally, the modified top bar would commonly go in the center frame slot of the bottom deep of a two-deep colony. True, the modified frame has 1" less comb space, but that would not be a problem.

A modified top bar for holding a queen cage.



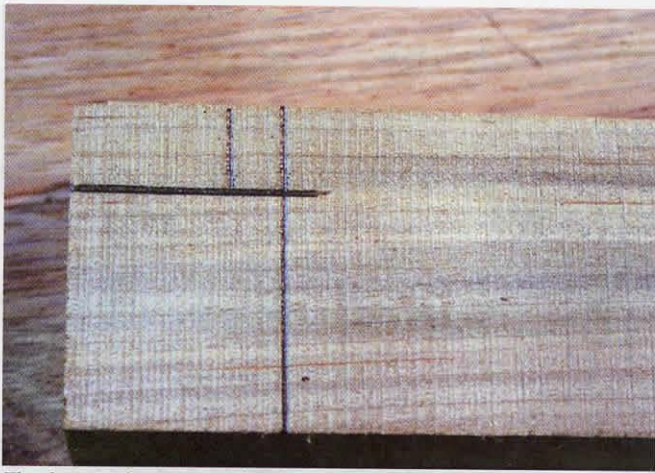
For your building enjoyment, I offer the following modified queen introduction top bar. It is not my idea and I apologize for not remembering whose it is. I built the top bar from someone's design many years ago. We have used it frequently and have found it be useful – but not indispensable. As I said in my title, it is for the beekeeper who has everything. Also, it could be one of those things that one beekeeper builds and gives to others within his/her beekeeping group. The only thing modified about the frame is the top bar so I have inverted the frame in the following photo to give a general view of the top bar.

Confidentially.....

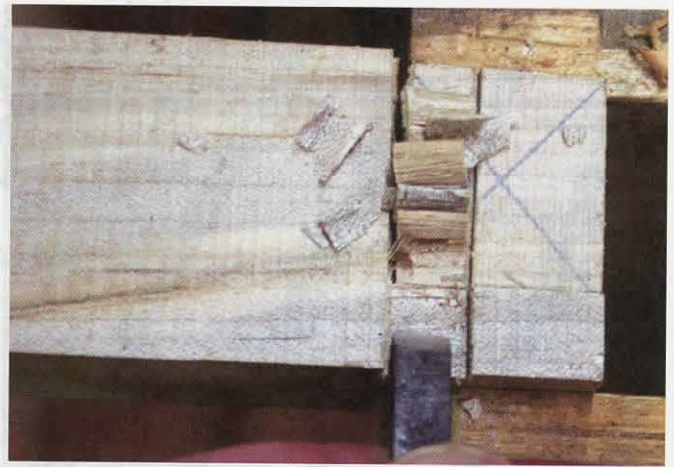
Honestly, I tried to build the top bar using common, but appropriate, woodworking procedures, but you could modify a common top bar to accomplish the same thing. You could cut out a 4" section of a common top bar and add a shallow board beneath the cut top bar to improvise a slot. In this case, neatness would not count, but had I done that, the woodworkers amongst you out there would have criticized my procedure.

Dimensions of the slots.

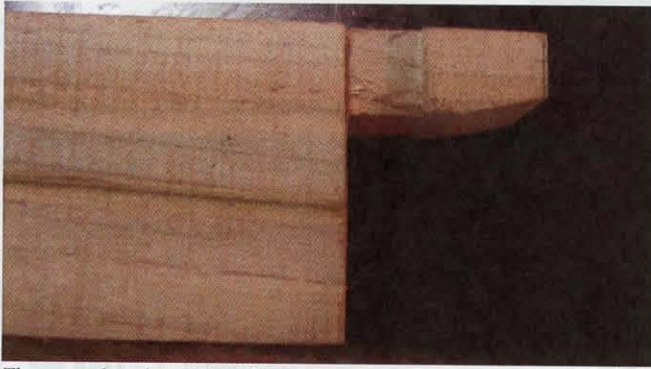




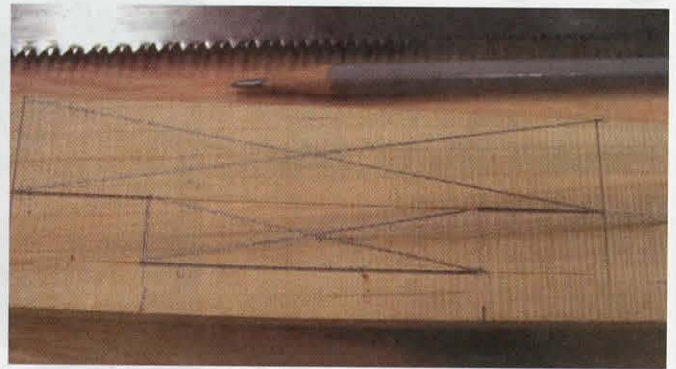
The layout for cutting the end lugs.



Using a narrow chisel to cut end bar grooves.



The completed end bar lugs.



The layout lines for cutting the slots.

Dimensions

The overall dimensions of the modified top bar are:

- 19" long
- 1" wide
- 1 1/2" deep

The width (1") can be troublesome for some of you. Most common lumber will come in 3/4" thicknesses. A 2x4" board could be used to get the proper width but that will require some cutting.

Slot dimensions

The building procedure

There are innumerable ways to build this simple modified top bar. It could be built with common hand tools or, if you have them, with power tools. I used a mixture of hand and power tools.

1. First, I cut a wood blank measuring 19" L x 1-1/2" D x 1" W. I disassembled a shipping pallet to get my construction lumber.
2. Then, I lay out for the lugs on the ends of the top bars. I cut out a 1" x 1" plug. The upper parallel lines will be a shallow groove in which the end bars will fit. The one inch square corner can be cut with a hand saw or with power tools.



The slots after having been cut.

3. After cutting out the 1" square, I use a sharp chisel to nibble a 3/8" groove that is hardly 1/16" deep on each side of the lug. As I said in #2, these grooves are for the end bars to fit. I temporarily use the 1" plug to keep my chisel from striking my vise.
4. After cutting the grooves, I sand a shallow taper on the ends of the lugs, but this step is not necessary. At this point, the end lugs are completed.
5. Next, I lay out the lines for cutting the slots using dimensions given above in figure 2.
6. I have multiple choices for cutting the slots. Though I could have used hand tools, I used



The introduction frame surrounded by frames.



A queen cage in position.

my band saw for accuracy and quickness.

- 7 I cut a groove on the bottom of the top bar to receive a sheet of foundation. The groove is 1/8" by 1/4". This is normally just the width the saw blade. If you wish to use wired foundation, you might want to make to a side cut to form the traditional top bar wedge, but I prefer to use a sheet of plastic foundation and suspend it in grooves.
8. The top bar is attached to end bars in the normal way. From the top view, the opening for the queen cage will be obvious. Practically any style of queen cage will fit into the slot.

Finally

This contraption isn't necessary, but it is convenient to use and fun to build. It's quick to make and you can justify a variety of tools to build it. Also, it will be a conversation piece at your next bee meeting. Again, thanks to the unknown beekeeper who gave me the idea many years ago. **BC**

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The Honey Counter-Revolution

A counter-revolution? Don't worry; no one needs to worry about buying camouflage fatigues or target practice at the rifle range. It's a kitchen-counter revolution. The goal is to liberate the slaves to sugar and artificial sweeteners, by replacing sugar bowls with honey jars. Ambitious? Yes. Difficult? Yes. But without a strategy that promotes your honey as a healthy and natural alternative to the sugar bowl itself, national trends appear to indicate that honey sales will shrink.

Let me explain

My father was a salesman until he retired and started keeping bees. He sold lighting fixtures, and developed an encyclopedic knowledge of not just the products he sold, but more importantly, the competition's products. He was able to discuss the advantages of one light versus another in great detail, so his way of "selling" was more "applications consulting" to builders and architects than a "sales pitch." It worked.

What does this have to do with honey? Well, if you want to sell honey, it helps to know "the competition." Consumption data indicate that honey is one of the more rarely-used sweeteners available, so even a small change in consumer habits for a tiny percentage of consumers would have a significant impact on the demand for honey.

The good news for us is that the competition makes claims that are most charitably described as "blatantly misleading." Consumers do

not like to be misled, especially about food. You need not make extravagant claims about honey, you only need to debunk the misleading propaganda about the alternatives.

Honey was the original sweetener. Every other sweetener was created in an attempt to replace honey with something cheaper. Most people will agree that life is too short to tolerate cheap peanut butter, so honey should be an "easy sell" to anyone who cares at all about what they eat. (To quote my father, "Sure, you could use the cheaper stuff, but people will notice and remember.")

The Decline Of Cooking

The NPD Group, a market research firm, found that in 1993, 99% of U.S. households had a skillet. In 2002, the number dropped to 93%. That's a net decrease of over one million skillets per year. (If one does not even own a skillet, one can be assumed to have abandoned cooking for mere "reheating" of packaged food.) In 1993, 21% of U.S. dinners eaten at home had ready-to-eat main entrees, in 2002, it was up to 36%. Over the same time period, meals served with homemade desserts decreased from 7% to 3.5%.

Your grocery store may have already expanded their "deli" and "bakery" into a "ready-to-eat meals" department, complete with a salad bar. These "meal solution centers" are cropping up everywhere. Convenience stores, gas stations, airports, and shopping malls all offer "take out." Now the reason for all

those cup holders in newer vehicles should be clear - will the minivan replace the dining room? No one is saying, but the 2000 Ford Excursion SUV came with seating for nine and 10 cup holders. The current Volvo V70 seats five, but has nine cup holders. You do the math.

While we can all understand that life can get hectic for people who have not discovered "life in the slow lane" as a beekeeper, it seems clear that cooking (with or without honey) is slowly becoming as obscure and arcane a skill as beekeeping.

To make matters seem even worse, the same surveys found that 77 cents of every dollar spent on "dining out" in 2002 was spent at a fast-food chain restaurant.

What Happens After What Comes Next

The combined impact of these trends means that we can't expect to increase our honey sales to consumers or expect demand to keep the prices up unless we can get them to think about replacing the sugar bowls on their kitchen tables with honey pots, and consider abandoning artificial sweeteners for honey. Taking on the competition head-on means that you need to know more about the competition than the customer does.

Price alone can't be the problem, given what people will pay for Ghirardelli chocolates. The Starbucks and Dunkin' Donuts coffee shop chains have clearly shown that marketing alone will convince people to pay them more than triple

the going price for a cup of coffee. Honey has a fine "premium product" reputation, proven by the large number of packaged food products that feature the word "Honey" in large letters on the label. Honey even has a very valuable cachet of "natural" that sugar and artificial sweeteners can never gain. "Natural" sells, if for no other reason than it makes Mom feel less guilty about owning a stainless-steel Sub-Zero fridge filled with heat-and-serve packaged foods and using the microwave more often than her \$4,500 Aga range.

The only hurdle appears to be that beekeepers are unwilling to ask people what else they currently keep on the kitchen table, and discuss the merits of that sweetener as compared to honey. So read on, and think about how easy it would be to convince people to try using honey instead of sugar or chemical sweeteners.

A Brief History Of Sweeteners

It is likely that humans sought out honey even before they were recognizable as human. Food was likely in sporadic supply for early man, energy requirements were high, and honey would have been a rare treat. Man was predisposed by instinct to favor sweet things, since most everything that tasted sweet was not poisonous.

Most present-day humans have easy access to abundant food, and are not required to physically exert themselves very much, but we are still influenced by the same drives as our primitive ancestors. We still crave sweet stuff.

Despite the near total lack of situations where modern humans might need a high blood sugar level to help them escape from large toothy predators, sugar or sweeteners are added to nearly every packaged food product sold. These hidden added sweeteners are the dreaded "empty calories" that your mother warned you about, devoid of any food value other than the sugars themselves. Sweeteners are added for two reasons. First, they are cheap.

Second, there is a direct connection between sweetness and sales. Food conglomerates are well aware that all they need do to increase flagging sales of a packaged



food product is to increase the amount of sweeteners they add.

Fat-Free and Fact-Free

For at least a decade, "reduced fat" and "fat-free" food has been promoted as "more healthy." Makers of packaged foods have responded to demand, and in some cases, helped to create concern about fat. This meant more demand for "fat-free" food. The problem was that in removing fat, the packaged food products were left bland and tasteless. The "answer" was to add sweeteners, most often corn syrup. But when you add sweeteners, the calories go up. As a result, many people buying "low-fat" foods are actually consuming more calories than before due to added sweeteners. "Low-fat food" did not result in people becoming less fat. It made many of them even fatter.

Added Sweeteners And Health

The expanding waistlines of the population of the industrialized world has resulted in a new and unique health problem. The rich and middle classes are thin and healthy, while the poorer among us suffer from obesity. Traditionally in human history, the poor have been thin, while the rich have been fat. Ongoing obesity in most cases leads directly to diabetes, and not surprisingly, medications to help diabetes patients are suddenly one of the largest growth markets for drug makers.

The USDA says that Americans' consumption of sweeteners has risen significantly over the last 40 years. Somehow, we went from 113 pounds per person in 1966 to 147 pounds in 2001. Added sugars, as

opposed to naturally occurring sugars in fruit and other foods, are a little more than 15 percent of Americans' daily caloric intake.

While doctors, health experts and regulatory officials now realize that their emphasis on "fat free" has resulted in a problem worse than the one they hoped to solve, their attempts to educate consumers about "added sugars" have been frustrated by sophisticated marketing of high-profit products like soft drinks and packaged foods.

Big Profits Versus World Health

This Spring, the World Health Organization published a report suggesting that all forms of "added sugars" (over and above the natural sugars found in foods) should make up no more than 10% of the daily diet. While 10% is a very high number, the sugar lobby in the United States reacted by demanding that Congress cut off the World Health Organization's funding. Since the U.S. funds roughly a quarter of the WHO's operations, this would could put the WHO out of business.

The sugar industry was not at all happy with anyone suggesting that added sugars should be restricted to a mere 10% of our total diet. They want us all to buy more of the packaged food products that contain added sugars. The sugar industry is a significant special-interest group in U.S. lobbying and politics, handing out over \$3 million in donations in last year's federal elections, according to the Center for Responsive Politics. It represents both sugar cane and corn farmers who grow corn for corn syrup.



All Sweeteners Are Not Created Equal®

While artificial sweeteners like Equal® are clearly artificial manufactured products, most all so-called “natural” sweeteners also come from factories. Most natural sweeteners are no sweeter in their natural state than nectar. They must be refined to concentrate them, and make them taste sweet. In the process of refining, any part that is not a sugar is removed, including any nutrients.

Honey also comes from a “factory refinery” of a sort – a beehive. Nectar is evaporated, and in the process, becomes more concentrated. Unlike other sweeteners, all that is removed in the process is water, so honey has a small amount of protein and some nutrients. If not heated or filtered to extreme, honey has the clear advantage of being “exactly as nature intended.”

But what exactly did nature intend? Nature uses multiple forms of sugar in nearly every creature and plant, so we have to get into some basic biochemistry before we talk about specific products.

There are three simple sugars, or “monosaccharides.” These are Glucose, Fructose, and Galactose.

Glucose, also called “dextrose,” is found in vegetables, fruit, and honey. When it is in the human body, it is called “blood sugar.” In plants, glucose is synthesized from water and carbon dioxide by photosynthesis. In animals, glucose can be synthesized from fats, carboxylic acids, and amino acids. Glucose

is made of six carbon atoms (carbo...) and hydrogen and oxygen equal to six water molecules (...hydrate), so glucose is the simplest form of a carbohydrate.

Fructose, also called “levulose” or “fruit sugar,” is found in many fruits. Honey contains about 40% fructose.

Galactose exists almost exclusively in the bodies of mammals. Mammals can change glucose to galactose, and female mammal mammary glands convert galactose to lactose, which is “milk sugar.”

Although these three simple sugars share the same molecular formula ($C_6H_{12}O_6$), the arrangement of their atoms are different. Chemicals with identical molecular formulas but different structural arrangements are called “structural isomers” by chemists.

Glucose can be converted into the other two simple sugars (and other sugar molecules) via minor chemical changes like reorienting the location of hydroxyl groups, such as when it is converted into galactose, or by oxidizing one carbon and reducing another by shifting the locations of the hydrogen atoms, such as when it is converted into fructose.

All more complex sugars are made by bonding these three simple sugars together in various ways.

I’m Dying For Some Disaccharides

Disaccharides are nothing more than pairs of simple sugars. Their names are sucrose, lactose, and maltose. Sucrose is common table sugar. It is made from glucose and fructose, which form a crystal when combined. Lactose is the major sugar in milk. It is made of glucose and galactose. Maltose is a product of starch digestion, such as when beer is brewed. It is made of pairs of glucose molecules.

Is Honey a Disaccharide?

Honey contains glucose and fructose, but it is not a disaccharide. The bulk of the glucose and fructose exist as separate simple sugars. A tiny amount of the glucose and fructose in honey is bound together to form sucrose, but this varies with different nectar sources, explaining why some types of honey, such as orange blossom honey,

crystallize more easily than others. The crystals of sucrose act as “seeds” to encourage crystallization in the honey.

Starches Are Sugar Too!

When you link more than two simple sugars together, the result is called a “polysaccharide,” or, in plain English, a “starch.” There are two major types of starch – Amylose and Amylopectin.

An amylose is a linear, unbranched chain of several hundred glucose molecules. Amylopectin does not have a “linear” structure, but is “branched” like a tree.

Plants convert excess glucose into starch for storage in the form of roots (tubers) and seeds. Potatoes, rice, wheat, and corn are major sources of starch in the modern human diet.

Before starches can be used by animals, they must be digested. This is accomplished by chemicals called “amylases.” With the aid of an amylase (such as pancreatic amylase from your pancreas), water molecules break the bonds between glucose molecules and eventually produce a mixture of glucose and maltose. Your body can’t tell the difference between glucose from starches, from sugar, or from honey. Glucose is glucose, no matter how your body gets it.

Cellulose – How Plants Store Sugars

Cellulose is likely the single most abundant organic molecule on the planet. It is the major structural material in plants. Wood is mostly cellulose, while cotton and paper are almost pure cellulose. Like starch, cellulose is a polysaccharide made from glucose.

However, cellulose is very different from starch. Because of the orientation of the bonds between the glucose molecules, the end result is a long, rigid molecule. These linear molecules can lie close together, and form hydrogen bonds between adjacent molecules. The result is a series of stiff, long fibers that make up the cell walls of plants.

Glycogen – How Animals Store Sugars

Animals store excess glucose by polymerizing it to form glycogen. The

structure of glycogen is similar to that of the starch amylopectin, although the branches in glycogen are shorter and more frequent. (A “bush” as compared to the “tree” of amylopectin.)

Glycogen is broken back down into glucose when energy is needed, in a process called glycogenolysis. In glycogenolysis, phosphate groups – not water – break the linkages so that glucose can leave or enter a cell. Your liver and skeletal muscles are major storage depots of glycogen.

Sugars In Food

Now that you have digested the chemistry refresher course, we can look at specific sweeteners, compare them, and consider how they compete with honey for a place on the kitchen counter.

Raising Cane

Cane sugar comes in many different forms, but it is all nothing but sucrose. It is all processed in factories that produce significant air and water pollution, but are slowly being forced by environmental laws to clean up. The sugar that one can buy is not “natural” in the least, but the sugar makers use the word “natural” so often, one might get the impression that their products were some sort of health food.

All forms of cane sugar start with a sugar cane field in a subtropical location. The canes have leaves, and the universal practice is to burn the field to eliminate the leaves and any undergrowth from the roughly 10-foot tall canes to be harvested. The smoke from the fall burning is enough of a hazard that the state police in both Florida and Hawaii are forced to close roads when the wind shifts in an attempt to reduce traffic accidents caused by the smoke. (That’s right, sugar is “white death” even before it is even white. Ask anyone who lives in Palm Beach County or Hendry County, Florida about the “fall smoke.”)

The harvesting of sugar is slowly being mechanized, but about half of U.S. production is still harvested by hand with machetes. This is a labor-intensive process, so much so that sugar plantations in the Caribbean were among the first customers of the slave trade. The infamous “slave triangle” described in

our history books was based on sugar. American-made rum was sold for African slaves, who then were sold in the Caribbean for molasses and sugar that were, in turn sold to rum distillers in the U.S., with large profits made at every step. (Wow, sugar was responsible for slavery!)

Whatever harvested cane does not fall off the trucks to punch holes through unsuspecting drivers’ oil pans and radiators (yes, this really happens) goes through a mill.

The milling process starts by shredding and crushing the canes between rollers to extract the juice. The juice is clarified with lime, and allowed to settle. Then it is boiled in vacuum chambers, until it thickens into a brownish syrup. As the water evaporates, the sugars become concentrated enough to form crystals. The wet crystals are then spun in perforated drums to spin off the liquid, leaving the semi-refined sugar. This is the actual “raw sugar.”

It contains all sorts of molds, yeasts, dirt, plant fiber, bacteria, and a not insignificant quantity of insect parts and their debris. The FDA won’t allow this sugar to be sold as food – true raw sugar is “unfit for human consumption” under U.S. law.

The liquid that was thrown off by the spinning drums is what becomes molasses. It also needs quite a bit of “cleaning up” before it can be sold for human consumption.

The cleaning up is done at a refinery. The refinery washes, then dissolves the crystals, boils it again, then recrystallizes and spins it at least twice more, removing more molasses and “solids” at each step. Molasses is where the non-sucrose components of sugar cane go, including any vitamins and minerals.

Brown Sugar

Sugar pulled out before one of the final washing and recrystallization cycles is “brown sugar.” It has been refined enough to remove all but a tiny fraction of the molasses, which gives it a brown appearance and stronger flavor.

But most brown sugar is nothing more than fully-refined white sugar that has been sprayed with some molasses after the complete refining process. Domino and C&H are among the few brands that sell



legitimate brown sugar, most all other brands are nothing but fully-refined table sugar “spray-painted” with some molasses.

Raw Sugar – A Raw Deal

The brownish packets of “Sugar In The Raw[®]” one can find in many coffee shops are not “raw sugar.” They are nothing but “Turbinado Sugar,” which will be described later. The folks that make “Sugar In The Raw” claim that their sugar is from the “initial pressing of the cane, allowing the natural molasses to remain in the crystals,” a phrase that is apparently intended to conjure up images of winemaking, where “initial pressing” implies “best quality.” With sugar, the reverse is true. Sugar from the actual “initial pressing” is an inedible substance that could not be sold as food for humans. Even more amazing is the total disdain shown in the assumption that their customers are uneducated enough to think that molasses (a collection of various impurities) can somehow be “in” crystals of sucrose. The impurities are “on” the crystals, not “in” them. This much more expensive sugar needs to be exposed as “100% plain old sugar with lots of added hype.”

Brown Versus White

There are a large number of people who think that brown (or brownish) sugar is more “healthy” than white sugar. This mistaken belief is openly encouraged by the promotional efforts of sugar compa-

Continued on Next Page

A Summary Of "The Competition"

Name	What It Is
White Sugar	Sucrose
Evaporated Cane Juice	Sucrose
Sucanat	Sucrose
Beet Sugar	Sucrose
Brown Sugar	Sucrose & Molasses
Turbinado Sugar	Sucrose & Molasses
(Real) Maple Syrup	Boiled Tree Sap
Date Sugar	Dried Dates
Stevia	Dried Leaves

ARTIFICIAL TABLE SWEETENERS

Sweet 'N Low®	Saccharin
Equal®	Aspartame
NutraSweet®	Aspartame
Sunett®	Acesulfame Potassium
Sweet & Safe®	Acesulfame Potassium
Sweet One®	Acesulfame Potassium
Splenda®	Sucralose

SWEETENERS FOUND MOSTLY IN HEALTH-FOOD STORES

Invert Sugar
Brown Rice Syrup
Barley Malt
Fruit Sugar

INDUSTRIAL SWEETENERS HIDING IN PACKAGED FOODS

High Fructose Corn Syrup
D-tagatose
Sugar Alcohols
Polydextrose
Saccharin/Sweet 'N Low(R)
Aspartame/Equal(R)/NutraSweet(R)
Neotame
Sucralose/Splenda(R)
Acesulfame Potassium

nies about the "vitamins and minerals" in brown sugar that white sugar lacks. While it is true that white sugar contains nothing but sucrose crystals, the amount of "vitamins and minerals" in brown sugar are best described as "trace levels." You'd have to eat a massive and unhealthy amount of brown sugar to get any actual benefit from any of those vitamins and minerals. In comparison, the National Honey Board says that you'd have to eat only about 100 tablespoons of honey to get your Recommended Daily Allowance of a number of important minerals from that source. While some might consider this excessive consumption of honey, it is not only possible, but a certainty when we extract honey here at Farmageddon. (We have strict, ummm, "quality control standards." Yep, that's my story, and I'm stick-

ing to it. "Very extensive quality control testing.")

Size Does Matter

A bewildering array of different types of granulated white cane sugar are available, and all are sold for much higher prices than the usual 5-lb bag of "table sugar." The only difference between them is crystal size.

"**Bakers Special Sugar**," or "**Castor Sugar**" in the UK, is the smallest crystal size. This is the sugar you most often find on doughnuts.

"**Superfine**," "**Ultrafine**," or "**Bar Sugar**" has only slightly larger crystals than Baker's Sugar. It is used in meringues, as well as for sweetening fruits and iced drinks since the smaller crystals dissolve more easily than larger crystals. (There are some bartenders that will call this "Fruit Sugar" but actual "Fruit Sugar" is fructose which comes, not surprisingly, from fruit.) "**Confectioners**," or "Powdered Sugar" is granulated sugar that has been ground to a smooth powder and then sifted. It contains about 3% cornstarch to prevent caking. Confectioner's sugar comes in three grades ground to different degrees of fineness.

"**Table Sugar**" is the common sugar that one most often sees. Note the subtle use of the term "table," implying that it belongs on the dinner table, rather than locked up with the guns, cigarettes, booze, explosives, and other dangerous items. Does anyone label their honey "table honey"? I thought not. No wonder the sugar bowl never leaves the kitchen table, while the honey is hidden in a cabinet, behind several other bottles. You have to admire sophisticated marketing. You can learn something from it.

"**Coarse Sugar**" has larger crystals than "Table Sugar." Coarse sugar is made from the most highly-refined sugar. This makes it more resistant to color changes or breakdown to fructose and glucose at high temperatures. This matters in cooking when making fondants, confections, and liquors.

"**Sanding Sugar**" is another large crystal sugar, used to sprinkle on top of baked goods. The larger crystals reflect light and look pretty.

Brown Stuff

With all the different types of white sugar, you did not think that the sugar-marketing geniuses would pass up the opportunity to sell multiple types of sugar/molasses mixes at ever-higher prices, would you?

"**Turbinado Sugar**" is sugar with a slightly larger crystal size than table sugar, and has not been washed to remove all the molasses, making it appear brownish. As with brown sugar, most all products called "Turbinado Sugar" are produced by simply spraying crystallized fully-refined white sugar with molasses.

"**Muscovado**" or "**Barbados Sugar**" is a British product. It is very dark brown and has a very strong molasses flavor that can only be an "acquired taste." The crystals are coarser and stickier than "normal" brown sugar.

"**Free-Flowing Brown Sugar**" is a technical innovation that avoids the "clumping" of brown sugar into hard lumps. A "cocrystallization" process is used to make brown sugar that is more of a powder than a crystal, and is less moist than brown sugar. Since it is less moist to begin with, it does not clump and is free-flowing like granulated white sugar. (Save your money, and put a small chunk of terra-cotta tile that you have soaked in water into your canister of brown sugar. This will "humidify" the canister, and keep the brown sugar from clumping.)

"**Demerara Sugar**" is another British product, essentially a very sticky large-crystal brown sugar. It is put in tea, coffee and on hot cereals.

"**Evaporated Cane Juice**" and/or "**Sucanat**" is one of the most cynical of the sugar industry's marketing forays, which like Turbinado Sugar, chatters on about being "a 'first crystallization', minimally-processed sweetener made from fresh evaporated cane juice... harvested, extracted, clarified, evaporated and crystallized all within twenty-four hours..." in hopes of making people think that it is something, anything other than pure sucrose with trace amounts of junk of an unspecified nature. Note that the word "sugar" will never appear on a package of "evaporated cane juice," since this form of sugar is sold to people who associate "sugar" with "bad nutri-



tion." You have to admit that the sugar people know how to package and market a product.

A Brief Word From The Salt Mines

Sugar promotional efforts have apparently taught the people who sell salt something about marketing. You may have noticed the sudden appearance of "Sea Salt" on grocery shelves, with crystals larger than usual. This one really makes me laugh, since it is strictly true that the package contains "sea salt." ALL salt came from seas, but all except a tiny fraction of what is sold happen to come from seas that dried up millions of years ago, and have been covered up by layers of rock since then. Real "sea salt" is evaporated from seawater, is very expensive, and is a snobbish affectation for social-climbing cooks who never took any chemistry, and want to impress people with the fact that they use salt from places where most people would like to vacation. As usual, vague hints that anything "more natural" or "less processed" is somehow different, better, and more healthy surround these "sea salt" products. The lesson should be clear to someone with a product that truly is natural.

Light Brown Versus Dark Brown

By now, you likely have figured out that "Light Brown Sugar" contains less molasses than "Dark Brown Sugar," and likewise, "Blackstrap Molasses" is simply darker than regular molasses.

You can dismiss all forms of sugar as "exactly the same" from not only a chemical, but also a

health and nutrition standpoint with no fear of being even slightly wrong, but you should also stop and marvel and the sophisticated marketing used to make even experienced cooks think that they must buy more than sugar and molasses for their pantry. There has to be something that we can all learn from this about application-specific packaging and pricing for honey.



Even skilled bakers, who should know better, buy brown sugar rather than simply add molasses and white sugar to a recipe that calls for "brown sugar."

The Cane Mutiny

There are nearly as many non-cane sugars as there are types of cane sugar. While these products are nothing more than one or more of the same three simple sugars described at the start of this article, these products exist simply because they are not made from sugar cane, a point that is either stressed in an attempt to seem more healthy,

or hidden completely if the product is cheaper than cane sugar.

"Beet Sugar" is what you get if you buy a bag of sugar at the store that does not say "Pure Cane Sugar" on the label. I'll bet your local store brand and generic brand sugar bags don't say "Pure Cane Sugar." In 1744, a German chemist realized that the sucrose he could extract from sugar beets was the same sucrose as sugar from sugar cane. (He broke the starches down into sugars with nothing more than hot water.) Napoleon supported the sugar beet growers when war with England resulted in blockades, halting sugar shipments from the Caribbean.

While crystals of sucrose from sugar beets should be no different than crystals of sugar from cane, experienced cooks avoid beet sugar when making frostings, jellies, and many cakes. I've yet to hear anyone explain the exact difference, but scanning electron micrographs reveal that cane sugar crystals are "cleaner-looking" than beet sugar crystals. Since pure sucrose would form similar "clean" crystal shapes regardless of source, it seems clear that refined beet contains a larger percentage of impurities than refined cane sugar.

"Invert Sugar" starts as refined sugar. Acid and heat break down sucrose molecules to a mixture of glucose and fructose. Candy manufacturers use invert sugar to control "graining." This is not a "consumer sweetener," but is used by advanced home confectioners.

"Brown Rice Syrup" is extracted from rice with enzymes that partly break down the starches into



their component sugars, and is then strained and cooked. The final product is 50% "soluble complex carbohydrates," which means molecules of starch that were not completely broken down into sugars, 45% maltose, and 3% glucose. You won't find this much outside of health-food stores.

"Barley Malt," like brown rice syrup, comes from grain, specifically barley. It consists of about 40% "complex carbohydrates," 42% maltose, 6% glucose, and about 1% fructose. This is another health-food store product.

"Fruit Sugar" is pure fructose. Fruit sugar is claimed to have a more uniform crystal size than Bartender's Sugar from cane, but I keep forgetting to bring a microscope when I go to a bar, so I have not verified this. True fruit sugar will be clearly labeled as being made from fruit. If it does not say so, it should be assumed to have been made from corn syrup.

"Corn Syrup" and "High Fructose Corn Syrup" should be familiar to beekeepers as a food source for colonies in danger of early Spring starvation. This stuff is cheap to make, so it is ubiquitous in processed foods and beverages, even food found in "natural food stores." Despite the name, the fructose is not from fruit but comes from breaking down cornstarch with enzymes, acids, and heat. Corn syrup is the primary source of the "added sugars" in the diets of most of the industrialized world at present, so people who even go so far as to stop using sugar still get more sugars from corn syrup alone in their diet than nutrition guide-

lines suggest. "Dark Corn Syrup" is nothing more than Light Corn Syrup to which coloring and flavoring have been added.

High Fructose Corn Syrup In Both Food And Beekeeping

To make HFCS, processors first extract dextrose from corn. Enzymes are then used to convert the dextrose to fructose. The result is 42% fructose corn syrup, or "42-HFCS," which consists of: 42% fructose, 52% dextrose, 6% disaccharides – often supplied in a "70% solids" mixture, which means 30% water.

By filtering this mixture, most of the molecules larger than fructose can be removed, yielding 90% fructose corn syrup. This can then be mixed with 42-HFCS to make "55-HFCS," which contains: 55% fructose, 41% dextrose, 4% disaccharides – often supplied in a "77% solids" mixture.

These syrups are considered equal to cane sugar as bee feed, and, when purchased in quantity, are considerably cheaper than sugar purchased in bulk.

Bill Bernacchi of B&B Honey Farm, near La Crosse, WI supplies significant quantities of HFCS to commercial beekeepers, and says that while both 42-HFCS and 55-HFCS are adequate bee feeds,

"Type 42 tends to crystallize easily, and when it does it is very hard and difficult to liquefy. It is used by very few commercial beekeepers. Those that use it are feeding when the weather is warm both day and night.

Type 55 is the choice of commercial beekeepers. It crystallizes very slowly, and can be liquefied readily if

it does set up. It is easier to liquefy than honey."

HFCS is most often diluted by beekeepers with an additional 10% water by volume to form a final HFCS concentration of between 60% and 70%.

While adding water slows the crystallization process, untreated water can contain bacteria that can cause the syrup to ferment or become rancid. The good news is that chlorine or chloramine in municipal water will kill the bacteria, but the bad news is that fluoride in municipal water is said to be toxic to bees over time. Water filters can block most of the fluoride and the chlorine or chloramine. (Yes, even water requires considerable thought in beekeeping.)

HFCS is available to the hobbyist beekeeper in five-gallon pails and 55-gallon drums from B&B Honey, Mid-Con, and Betterbee. Some local beekeeping associations also get together and split a large order.

Higher Than "High"

If "High Fructose" is not enough for your sweet tooth, you can buy 100% fructose made from corn syrup. A company named Estee in Garden City, NY sells crystallized fructose that they admit is "made from corn." Their marketing is much more primitive than their chemistry, as their product is named "Fructose Natural Sweetener," and their "pitch" is limited to "sweeter than sugar," "a sodium free food" and "no bitter aftertaste" in big letters on the side of the box. Perhaps they are simply being honest about their product.

Much Less "Manufactured" Sweeteners

There are a small number of sweeteners that cannot be dismissed as products of smoke belching factories owned by massive corporations. In a fair evaluation, these should be given nearly equal respect with honey.

Pure Maple Syrup and Maple Sugar come from the sap of hard maple, rock maple, and black maple trees. Anything that does not say "Pure Maple Syrup" likely has no actual maple syrup in it at all. I'm going to go easy on maple syrup, since there are a number of maple syrup producers who also keep bees, maple syrup is not a general-purpose sweetener that "competes" with honey, and I like maple syrup. (I'm still working on my long-term research project to officially settle the long-standing dispute over whether New Hampshire maple syrup is better than Vermont maple syrup or visa-versa, so producers from each state are encouraged to send samples for, ummm, "extensive testing" to me in care of this magazine. Please use plain, unmarked boxes, or the editor will grab it all.)

In late Winter, trees are tapped by boring a small hole to obtain the dilute juice or sap. This sap is strained and excess water is evaporated off, resulting in syrup. This used to be done in open kettles over a fire. Modern operations use multiple evaporators, and syrup producers love stainless steel as much as beekeepers. It takes approximately 34 gallons of sap to make one gallon of syrup. If this maple syrup is heated to about 230°F and cooled quickly without stirring, it will crystallize and form maple sugar.

"Date Sugar" is another sweetener that deserves respect. It is made from dehydrated dates that are ground into a powder. It has roughly the same nutrient value as dried dates, which makes it the only sweetener that can be truthfully said to contain significant food value beyond the sugars.

An obscure product, "Stevia," is nothing but the leaves of a South American shrub. Though it is sweet, the FDA has not yet approved it as a food additive, so it is sold as an "herb" or "dietary supplement" with a wink and a nod. If studies are

What's Really In Honey

(Lifted from <http://www.nhb.org/download/factsht/techbroch.pdf>)

The National Honey Board says that overall, honey contains the following items, in the following amounts:

	Average		Average
Fructose/Glucose Ratio	1.23	Moisture, %	17.2
Fructose, %	38.38	Reducing Sugars, %	76.75
Glucose, %	30.31	Sucrose, %	1.31
Minerals (Ash), %	00.169	Total Acidity, meq/kg.	29.12
		True Protein, mg/100g.	168.6

The Major Enzymes Present In Honey

Enzyme	Function
Invertase	Converts sucrose to glucose and fructose
Amylase	Hydrolyzes starch to dextrins and/or sugars (diastase)
Glucose Oxidase	Converts glucose to gluconolactone, which in turn yields gluconic acid and hydrogen peroxide
Catalase	Converts peroxide to water and oxygen
Acid Phosphatase	Removes inorganic phosphate from organic phosphates

Nutrient Values

Nutrient Average amount Average per 1 Tbsp. serving amount (21g) per 100g

Water	3.6g
Total Carbohydrates	17.3g
Fructose	8.1g
Glucose	6.5g
Maltose	1.5g
Sucrose	0.3g

VITAMINS

Thiamin	< 0.002 mg
Riboflavin	< 0.06 mg
Niacin	< 0.06 mg
Biotin	Not available
Pantothenic Acid	< 0.05 mg
Vitamin B-6	< 0.005 mg
Folate	< 0.002 mg
Vitamin B-12	Not available
Vitamin C	0.1 mg
Vitamin A	0
Vitamin D	0
Vitamin E	0

*Contains less than 2% of the Daily Value for vitamin A, vitamin C, iron and calcium

Information For Nutritional Labeling*

Total Calories	64 (kilocalories)
Total Calories from Fat	0 (kilocalories)
Total Fat	0
Saturated Fat	0
Cholesterol	0
Sodium	0.6 mg
Total Carbohydrates	17g
Sugars	16 g 76 g
Dietary Fiber	0 0
Protein	0.15 mg 0.7 mg

MINERALS

Calcium	1.0 mg
Iron	0.05 mg
Zinc	0.03 mg
Potassium	11.0 mg
Phosphorous	1.0 mg
Magnesium	0.4 mg
Selenium	0.002 mg
Copper	0.01 mg
Manganese	0.03 mg
Ash	0.04 g

done that prove that it is safe, it could become the first bona-fide natural "diet sweetener." The leaves contain several chemicals called glycosides, which taste sweet, but have no calories. Stevia has taken over 40% of the Japanese sweetener market, so it may become a major sweetener worldwide.

"Sorghum Molasses" is still available, and it was the first form of molasses made in the U.S. Sorghum stalks are ground up or pressed, and the juices drained. The exact final product depends upon the degree of evaporation.

Semi-Artificial Sweeteners

There are three sweeteners that can be made from "natural" sources, but require quite a bit of fancy chemistry to create. None of these are consumer products; all are special-purpose chemicals for highly-processed food.

"D-tagatose" is about 92% as sweet as sucrose, but it is poorly metabolized, has a net impact of only 1.5 calories per gram instead of the four calories per gram one gets from all forms of carbohydrates. Structurally, it is close to fructose. Tagatose can be made from whey, a byproduct of cheese making.

"Sugar Alcohols," such as

Continued on Next Page



Sorbitol, Xylitol, Lactitol, Mannitol, and Maltitol are used mainly to sweeten sugar-free candies, cookies, and chewing gums. These forms of sugar are so poorly metabolized by the human body that the term “sugar free” is fairly accurate for products that include these chemicals.

“**Polydextrose**” is synthesized from glucose, plus roughly 10 percent sorbitol and 1 percent citric acid. It is used as a replacement for sugar, starch, and fat in low-priced, low-quality commercial cakes, candies, dessert mixes, gelatins, frozen desserts, puddings, and salad dressings.

Sweeteners Not Found In Nature

All artificial sweeteners face a serious and basic problem. No one knows one from another, and most of them have caused cancer and other severe health problems in white lab mice. Never mind that mice are a lousy stand-in for humans in many ways, and don't even bother to mention that most “white lab mice” are actually rats of a breed called “Norwegian Gray.” Bottom line, artificial sweeteners scare people. They have every right to be scared.

Cyclamate was marketed in the 60s as a “miracle product,” but FDA banned it in 1970 after evidence emerged linking it to bladder cancer. Subsequent studies have failed to verify that link, so the FDA is considering a petition to re-approve cyclamate. This product will likely undergo a significant name change if the FDA re-approves it, as the story of cyclamate is too well known.

Saccharin (Sweet ‘N Low®) is a synthetic compound derived from coal tar. (Yum! Pass the COAL TAR!) It is claimed to be 300 times sweeter than sugar. Saccharin is forced to carry a warning label, since U.S. studies in 1972 and 1973 of rats fed saccharin resulted in bladder cancer, and a 1977 Canadian study confirmed the U.S. studies. The FDA proposed to ban saccharin for all uses except as an over-the-counter drug, but since it was the only sugar substitute available at the time, it was not banned. More recently, the FDA considered removing it from the list of known carcinogens. Expect another name-change for this chemical, since it has nearly as bad a reputation as Cyclamate.

Aspartame is sold under the brand names Equal® and NutraSweet®. The beverage industry, the biggest user of artificial sweeteners, likes aspartame because it has no aftertaste and requires no warning label. Independent studies have suggested that it contributes to the “formation of formaldehyde adducts,” and the approval of this chemical was the subject of a great deal of controversy even within the FDA. In essence, formaldehyde is a scary thing as it damages to the neurological system even at very low levels. The only warning label on products containing Aspartame says “Phenylketonuric” or “Contains phenylalanine.” Phenylketonuria is a rare genetic disease in which the body cannot use the chemical phenylalanine.

Neotame is a new chemical approved by the FDA in 2002. It is very similar to Aspartame and is claimed to be 30 times more powerful a sweetener than aspartame. There is also a great deal of controversy surrounding this chemical, as it is hard for anyone to ignore reputable scientists doing independent studies and using terms like “neurotoxin” in their reports. Since the same company makes both aspartame and neotame, expect to see neotame in packaged food products, but not as a sweetener packaged for sale to consumers.

Sucralose is sold under the brand name Splenda®. It is a chlorinated form of sucrose, so it is derived from sugar, but is non-caloric, and contains less than one gram of carbohydrates. Pre-approval testing

showed that side effects included shrunken thymus glands, enlarged livers, and enlarged kidneys, but the maker argued that this was only at very high doses, convincing the FDA to approve it.

Splenda has been the subject of a recent and massive advertising blitz claiming that “Splenda is made from sugar, so it is as safe as sugar.” But is it? There have not been any long-term studies on the effect of this chemical on humans, not even a 12-month or 24-month study, and in the tiny number of studies done on this chemical, the lab rats did not fare well at all.

The “chlorinating” process used prompts concern on the part of some health experts. The process chemically changes the structure of the sugar molecules by substituting three chlorine atoms for three hydroxyl groups. But are the resulting chlorine atoms “safe” like in salt, or a potential health problem, like in “Chlorinated Pesticides” such as DDT? Only time will tell, but the actual chemical name for what comes out of the “chlorinating” process is “1,6-dichloro-1,6-dideoxy-BETA-D-fructofuranosyl-4-chloro-4-deoxy-alpha-D-galactopyranoside,” so it should be clear that this stuff bears no resemblance to sugar at all, and is a much more complicated structure than the simple bonding of sodium and chlorine to form salt.

The manufacturer claims that sucralose passes through the body rather than being metabolized, but the FDA disagreed, finding that 11% to 27% of sucralose is absorbed in humans. The bottom line here is that we have a very complex chlorinated molecule, one metabolized by the human body, and one where no one has even bothered to look at health effects on humans for a single year.

Another problem with sucralose is purity. The FDA says that sucralose “is produced at an approximate purity of 98%.” The other 2% varies, but includes contaminants like heavy metals (such as Lead), Arsenic, Triphenylphosphine Oxide, Methanol, Chlorinated Disaccharides, and Chlorinated Monosaccharides.

In contrast, if such contaminants were found in honey at even parts-per-billion levels, entire shipments of honey would be seized,

product recalls would be issued, and a great deal of negative publicity would result. Somehow, chemical sweeteners can be sold even though they are contaminated at rates as high as 2%.

Acesulfame Potassium is sold under the names Sunett®, Sweet & Safe®, and Sweet One®. It is FDA-approved for baked goods, frozen desserts, candies, and beverages. The Center for Science In The Public Interest urged the FDA to ban this chemical based upon both inadequate testing, and cancer in test animals resulting from what little testing was done.

In summary, artificial sweeteners are easy to sell against, by simply learning what they really are, and cutting through the marketing hype to expose the chemistry set of substances found in every package.

But What Goes On The Table?

Don't make the mistake of thinking that plastic squeeze bears are the only packaging required to get honey a place on the dining room table. Take a look at sugar bowls – they match the china. While every beekeeper meeting silent auction includes decorative honey pots and dippers, using dippers can be a messy experience for those unfamiliar with them.

A better alternative is a "syrup dispenser" of the type found at diners. These have a sliding metal tab that opens when a trigger is pulled or a lever is pushed, and closes when released. This metal tab cuts off the flow of honey cleanly without drips, and does a good job of keeping the honey sealed away from air, dust, and moisture.

Restaurant supply houses sell these for as little as \$2 each. Fancy versions exist, but you need to have these available for sale, or at least to show the customer a dispenser that works without looking tacky.

How Do You Use Honey Where A Recipe Calls For Something Else?

This is another common question, and is easy to answer. Honey can easily replace sugar in most any recipe. 3/4 cup of honey replaces one cup of sugar. Reduce liquids by one-half cup for each cup of honey you add to the recipe.

To substitute honey for molas-

ses, use exactly the same amount. The resulting flavor and color will be "lighter."

To substitute honey for corn syrup, use exactly the same amount, but consider reducing other sweet ingredients, as a honey is sweeter than consumer-packaged corn syrup.

Dealing With The "Honey Is Messy" Objection

Clearly, people who cook and care about what they eat are the prime targets for the suggestion that honey can replace other sweeteners, but cooks must measure their ingredients, and honey can be a problem, as more seems to stick to the measuring cup than go into the mixing bowl. The answer is a "Wonder Cup," a measuring cup in the form of a cylinder with a bottom that can be pushed up to the top edge, so that not a drop of honey is wasted. These sell at retail for about \$5.00, and they really do work as claimed. Other techniques work as well including using a measuring cup for the oil component first.

Is Honey Sweeter Than Sugar?

Beekeepers get asked this question all the time, and it makes a great "science experiment" that requires no special equipment. School teacher's lounges are sure to have a microwave and/or a water cooler with a (red) hot water spigot, so you can even add this to a school beekeeper presentation.

Fill two cups with the same amount of boiling or hot water. In one cup, immediately add two tablespoons of sugar, measured with care. Once both cups have cooled, add two tablespoons of sugar to the unsweetened cup.

Once the sugar has dissolved, taste each. The cup you sweetened while it was hot will be noticeably sweeter.

The initial conclusion might be that more sugar dissolves in hot water than in cold water. But you added the same exact amount of sugar to each cup, and you can see that all the sugar is completely dissolved in both cups.

Then why is one sweeter than the other? The hot water inverts the sugar (sucrose) to become glucose and fructose, and fructose is sweeter tasting than the more com-

plex sucrose. Since honey contains more fructose than sucrose, there are very similar odds that your taste buds will encounter the sweeter fructose, and consistently experience a "sweeter" sensation with honey as opposed to sugar.

Sweetener Sweetness Relative To Sucrose

Sucrose	1.0
Glucose	0.6
Fructose	1.73
Lactose	0.16
Mannitol	0.6
Sorbitol	0.5
Xylitol	1.0
Maltose	1.0

Gee, that's neat Mr. Science, but what about people over 10?

Easy – offer a taste test. If you are like most beekeepers who sell to the public, you lay out disposable spoons or straws and a "taster" jar front and center. Keep a handful of packets of each of the competition's products in your pocket, and do the obvious. Even honey of marginal quality will "win," since all the other stuff tastes like "nothing."

Invasion of the Space Sugars!

Scientists found extraterrestrial sugar compounds in the "Murchison" and "Murray" meteorites. This discovery gives solid support to the view that meteorites could have delivered compounds that contributed to the development of life on Earth.

The meteorites have a higher concentration of simple sugars than of the large, complex sugars that are abundant on Earth. Also, the ratio of carbon-13 to carbon-12 in the meteorites' sugar compounds matches that expected from extraterrestrial sources.

Some of these compounds might even predate the solar system, originating in the interstellar cloud of gas and dust that gave birth to the sun. Last year, scientists reported that they had found a simple sugar in a star-forming cloud 26,000 light-years from Earth using spectroscopy. **BC**

James Fischer keeps bees and spends his Winters working on the Unsolved Problems of Science, such as why a pint of "Heavy Cream" actually weighs less than a pint of "Light Cream."

THE NATIONAL

Gladstone Solomon, President, Tobago Apicultural Society

*Eighty years or so ago,
The National Honey Show was born,
It was quite some time you know,
The Show took its place in the sun,
There were challenges along the way,
But its evident the Show is here to stay,
I urge every beekeeper today,
Enter and have some fun.*

Beekeepers of whatever genre know that bees produce their best honey. Not so with some of my customers, particularly those who know that I won several awards at the National Honey Show in London or are otherwise convinced that my honey is better than everybody else's.

As much as I like the adulation, my sense of fair play often caused me to shift their focus to the bees and their natural environment. "No its not me, the bees do all the work, I merely facilitate them." I'm fortunate to have colonies located in an area with multi-floral nectar sources that influence the aroma, viscosity, and taste of the honey the bees produce. Several other beekeepers on the island have also won awards at the National Honey Show or are similarly located, their honey is just as good," I try to explain in the vernacular.

Having repeated the explanation over several years, I'm convinced that some customers are less inclined to believe me, preferring instead to believe that they are buying the best honey in the world. In such cases I no longer force the point.

But really, is it true that bees produce their best honey? I think they do, since bees operate at their optimum capacity under prevailing circumstance, they produce the best honey they can produce at the time. I'm equally convinced however, that one beekeeper's honey may be judged to be better than another beekeeper's. I'm also inclined to believe that the founders of the National Honey Show were also of that opinion when they decided to stage the first National Honey Show at the original Crystal Palace, Sydenham, London in October 1923.

Since then the Show has grown tremendously, crossing over 2100 entries and 250 exhibitors in 1951,

and expanding from 16 classes in 1923 to approximately 170 at present, 33 of which are international classes. The categories of classes include, clear, naturally crystallized, soft set, chunk, and comb honey; beeswax - candles, foundation or molded; photographic - videos, transparencies and prints; confectionary - cake, biscuits, cookies, sweets, and chocolates; labels; mead; and miscellaneous exhibits.

Over the years entries have been received from all over the world. Grenada, Nepal, Nigeria Somalia, Uganda, Ireland, Scotland, USA, St Lucia, Rodrigues, and Trinidad and Tobago are some of the countries that have participated in the Show. Details of the history of the Show and a range of articles intended to support participation in the Show can be down loaded from the Show's website <http://www.honeyshow.co.uk>.

Perhaps you are contemplating participation in your county or state Honey Show or have probably done so before with some degree of success. Congratulations!! But have you exhibited at the Super Bowl of honey shows - the National Honey Show? The logistics of getting your entries to London may be a challenge. It's one that beekeepers from Trinidad and Tobago have had to overcome in its many incarnations since we first

entered the National Honey Show in 1987, winning a Silver Medal. Since then we have won over fifty-five awards at the Show including four silver medals, and the coveted Hender Cup on two consecutive occasions, 1999 and 2000.

No doubt your bees produce their best honey, but is your honey better than your colleagues, Margarete's from Uganda, Paul's from Rodrigues, Howard's from Grenada, or Welette's from Tobago. Let an international panel of judges at the National Honey Show decide.

Enter the National Honey Show today, have some fun. **BC**

The National will run from November 13-15, 2003 in London this year. See the web page for all the information you need to attend and to enter. There is also a concurrent educational meeting during the show, with a host of local, national and international speakers. Kim Flottum, Editor of Bee Culture Magazine is our opening speaker this year.



BEEKEEPER'S NIGHTMARE

Finding The Queen When You Must

Fall requeening can be a task, but if you must, here's how.

Jeff Ott

I think everyone has their own personal nightmares. In George Orwell's classic, *1984*, Winston's greatest fear was rats. He lost it when he was threatened with a cage of rats strapped to his head. Now, I agree that wouldn't be fun. However, I don't believe Winston ever experienced an over-turned eighteen-wheeler carrying honey bees. Now *that* would be a nightmare. Fortunately, most of us don't have to worry about that one, either. As hobbyists, we have more practical concerns, like trying to manage our hives on the weekends and an occasional weekday evening, when family demands are pulling us in directions other than the beeyard. That being the case, one fall chore that I think many beekeepers dread is finding the queen after the honey supers have been all been pulled and the hive population is at or near its greatest. This can seem like a nightmare to some beekeepers.

Why would a beekeeper undertake such a task? Many prefer to requeen in the Fall as they believe a younger queen will over-Winter better and go into the Spring with better results. But then, there are also the traditional reasons for requeening, such as to replace a lost or failing queen, disease, aggressiveness of the colony or perhaps it is just something you want to do. Regardless of the reason, you need not dread it.

Colonies this time of year are close to being at their maximum size. Typically, you've already pulled the honey supers and often there is a dearth of nectar so there may be 50-60,000 bees crammed into the two deeps that typically serve as the brood chambers. Opening the hive can sometimes seem like popping

the top of a carbonated drink with the bees just foaming up between the frames and out the top. It can be a bit intimidating if your goal is to find just one bee out those thousands: the queen.

Before we break open the hive, let's layout our 'tools'

- Hopefully, this is not the first time you've searched for the queen. For many beginning beekeepers, finding the queen in a five frame nuc can be difficult. You should have a good inspection process down and be able to easily identify the different types of bees in the hive. If you are uncomfortable with these tasks, try to find an experienced beekeeper to assist you. Having a second pair of eyes is never a bad thing when your goal is to find the colony's queen.

- Know why you are going to search for the queen. Is she failing? Is the colony aggressive? Is she old? Personally, I like to have a reason for opening and disturbing the colony. The general rule I've always remembered is that every time you open the hive, you take away one day of productivity from the colony because they must repair all the damage you've done opening the cover, pulling frames and "putting everything back as you found it." The bees don't see our efforts as anything but more work for them.

- How critical is it that she be found? This answer will determine to what extent you go to locate her. If this is just a fall inspection, you can look at the brood pattern and for eggs and determine the queen's condition. You do not necessarily need to find her. However, if your bee yard is a distance from home and you have a new queen to introduce, you will want to go to great

lengths to find her to lessen the stress on the new queen.

- Is the queen marked? Is she clipped? A marked queen is generally easier to find. "Generally" is the operative word. I've had queens that lose their marking, through wear and/or an improperly applied mark. You cannot always count on spotting the daub of color, so you better also be looking for the queen, not just the dot.

- Finally, where is the colony located? This can be the most important question to consider. If this is a backyard hive that is 'hidden' from your neighbors and only a stones throw from their backyard, you will have to chose your day, time and actions much more carefully than if it is out in the middle of a 40 acre field surrounded by nothing. Depending on how quickly you find the queen and what you need to do to find her, you may have many, many bees in the air and more than just a little bit upset. Be aware of your surroundings and don't risk a stinging incident with neighbors or even your family for that matter.

Finding the queen is truly a hit-or-miss endeavor. You may go out to the hive, expecting to take an hour of tedious, back tiring work to tear apart the hive only to find her on the first frame you pull! Or, you could pull the hive apart frame-by-frame and never see her. You just never know, but by being prepared, you'll be ready to do what you have to find her.

Before You Start

Before cracking open the hive, make certain your smoker is going well. Even though you do not want to use a lot of smoke, as I'll dis-



Put the excluder between the bottom board and first super.

cuss shortly, you do not want it to die on you either. Also, bring along an extra hive body to place frames in as you remove them. This will accomplish a couple of things for you. First, it keeps you from having 10 frames (and a lot of bees) lying about on the ground or leaning precariously against other hives and it will help to keep the bees from flying as you group the frames in the deep. Finally, it helps you to keep down the number of places a queen might be as you move equipment around. Bring a queen excluder, too.

When opening the hive, use as little smoke as possible. This may sound counter-intuitive when you know the colony is strong and potentially more active than usual, but excessive smoke will drive the queen away. She will naturally try to evade the light already and the smoke will just give her extra drive in her scurrying.

Finally, understand before you start, that this is potentially a time and labor intensive job. Don't start it when you have family or other commitments in an hour or even two hours. Give yourself plenty of time to spare so you will not be stressed, pressed and/or otherwise worried about time. Also, if you prefer not to be stung, be properly suited. If you get buried in the hive, you will have upset a great many bees and if you are doing this when the field force is all home, you will have plenty of bees in the air and in your face. The use of gloves is as always, up to you. However, you will not be able to safely pick up the queen with gloves on.

Open the Hive

I prefer to start two or three

frames in from the side. Carefully pull the frame and look for the queen as you pull it. Perform a 'quick-scan' of the frame in a clockwise pattern, starting at the top. Then carefully flip the frame and quick-scan the other side. The purpose of these



When done, look for the queen beneath the excluder.

quick scans is to try and find the queen before she scurries off and/or drops off the frame. In fact, this is no different from any other inspection during the year. Treat each frame as if the queen is on it. After the quick scan, take notice of the frame. If it is a frame full of capped honey and you do not find the queen on the quick scan, you can move immediately onto another frame. However, if the frame is light and has empty cells and or brood; per-

form a more thorough look at both sides of the frame. The queen can generally be found on a brood frame looking for clean cells to lay eggs. If during the quick scan you can see a lot of eggs, you'll know the queen has been on that frame any time from three days ago to right at that moment. Look closely as you may have missed her if she was in the process of laying an egg while you were quick scanning.

If you are unsuccessful, set this frame aside (in that extra super, which is sitting on the cover) and move to the next frame in the brood chamber. As you visually select the next frame, scan the top bars of the frames – maybe you'll spot her running across the top of the frames (though I must admit, I've never had this happen, but I still look...). Also look down the face of the frame before you dislodge and pull it. You may get lucky and see her. This is easier to do if the queen is marked with a light color.

Once you pull the frame, repeat the same steps as you did with the first frame: Quick scan, evaluate the frame then perform a thorough search if it is warranted.

What do you do if you get through all the frames in that deep and still cannot find her? Look along the walls of the deep, maybe she was never on a frame! Also, just like you should when performing any hive maintenance, always watch where you step and keep an eye for a clump of bees on the side of the hive or on the ground. It is very possible she fell off a frame and is on the ground between the hive and the extra hive body you are using to hold the inspected frames.

If you need to move into the next deep, place the inner cover on top of the deep holding the already-inspected-frames. This helps to keep the number of bees in the air down. The deep that was the second deep, will now become my holding deep as you perform the same procedure on the next hive chamber – frame by frame and even the bottom board!

If you have been unsuccessful in finding the queen up to this point, you have a decision to make as in all likelihood you've really upset the colony by this point and they are probably a bit hot. If I really need to find the queen today, I must

Continued on Next Page

move onto more drastic measures to find her that I will describe shortly. If you can come back in 3 – 4 days, I have another less severe step you can take.

A New Use of the Queen Excluder

Start to piece the colony back together. Place the frames back into their original deeps and positions while inspecting each frame for the queen as you do so. Once you have the original bottom deep back together and in place on the bottom board, place a queen excluder between the two hive bodies. This will confine the queen in one hive body or the other for the next couple of days. Put the second hive body on top of the excluder and place each frame back into this deep – inspecting each frame as you go. If you still do not find the queen, you've set yourself up to come back in 3 – 4 days to look for her again. If all works as planned, you will have confined her to one of the two hive bodies with the excluder. When you return, start just as you did before, although this time in addition to looking for the queen, *look for eggs*. Since eggs take three days to hatch, you know in whichever deep you find eggs you will also find the queen. By using this technique, you have eliminated one deep to inspect.

A More Drastic Approach

OK. Perhaps you've been unsuccessful in locating the queen, but you really need to locate her *today*: the queen excluder and three – four day wait is not an option. So what can you do now? Let's go back and see where everything currently sits. You've gone all the way down to the bottom board and still have not found the queen. You have at this point one empty hive body and two hive bodies with frames that have been inspected once and lots of bees in the air. (This is why it is not a good idea to search for the queen when your neighbors are hosting a backyard party).

Before you start, look again for the queen on the ground. Look for the telltale clump of bees on the ground, on the side of one of the hive boxes – anywhere. You just

might get lucky! If you do find her at this point, put the hive back together and go play the lottery. Today is your lucky day!

Next, lay a white sheet or other smooth piece of cloth leading up to the front of the hive. *Place a queen excluder on top of the bottom board and the empty hive body on top of this.* Shake each frame off in front of the hive and onto the white sheet. Watch for the queen as she follows the rest of the workers into the hive. Place the frame and each succeeding frame into the empty hive body to help draw the bees back into the hive. As you probably have figured out, the workers will go through the queen excluder into the hive body. If after you have shaken most if not all the frames and you still have not found the queen before she enters the hive, you can remove the hive body and search *through* the queen excluder for the queen. She may be there along with all the drones that also cannot pass through the excluder. Don't be tempted to remove the queen excluder to find her on the bottom board. She'll quickly disappear if you don't find her before you remove it.

Keep doing this until you isolate and find her. If you did not have a lot of bees in the air before, you will now. They will be everywhere!

Another Approach

I once had a beekeeper tell me to shake frames of bees off into an empty deep with a queen excluder on the bottom and then drive them through the excluder with smoke. He said that the queen would be trapped by the excluder and he would simply pick her up from there. This, though tiresome technique, works, as you are putting bees back in the hive, rather than out on the ground. Start with an empty super on top of another super, with the excluder between. When done, dump the bees back into your reconstructed hive.

If All of THAT Failed – Now What?!

What do you do if you've gone through all of that and you still cannot find your queen? Rebuild the hive with the queen excluder between the deeps and come back in three – four days. Remember that

you are trying to find one bee out of thousands! The odds really are stacked against you, even though she is larger than the workers and side by side easy to identify. Be prepared to simply come back and look for her again. There are going to be those days that the queen will outwit you. She can really hide when she wants to and will play on your patience. There must be some rule or some derivative of a beekeeper's "Murphy's Law" that states that the quicker you need to find the queen, the longer it will take. The corollary would also be true, because when you are in no particular need to find her, she'll be on the very first frame you pull. This is why it is important to start this undertaking with a clear calendar in front of you for that day.

All in all, you are looking at a project that could take the good part of several back straining hours. Now, imagine if you decided that you had many colonies to requeen in the fall! You can see the potential amount of time it could take and understand why most beekeepers prefer to requeen in the spring when the colony size is down, making it easier to locate the queen.

If you would like to see this technique used, I would highly recommend purchasing the video "Finding the Queen When You Must" produced by *Bee Culture* and featuring Dr. Jim Tew. Seeing it actually done is educational, especially if you do not have an experienced beekeeper around to help you.

There are legitimate reasons to requeen in the Fall and you should have the knowledge to attempt it as needed, but understand the requirements of the job before you undertake it. The worst part of any nightmare is the feeling of being out of control of what's happening. With a solid inspection technique and plan of approach, you can take the fear out of the equation and turn the effort into time well spent. It probably won't be easy and chances are it'll be tedious, but you will be in control of the situation and be able to find the queen when you need to.

Jeff Ott is a sideline beekeeper and photographer living in Berthoud, CO.

Dry Honey

Scott Holisky

USING AN AQUARIUM PUMP!

There is a saying here in Minnesota that "if you don't like the weather, stick around a day." Last year will go down on the record books as one of the wettest since the early 1900's. It seemed that during the nectar gathering season it rained every other day. Plant blooming was shifted from what I normally expected. Nectar flows were either boom or bust. Yet another reported "El-Nino effect."

Last year I had five hives in production for extracted honey. By early Fall they ranged from four to seven supers each of almost completely capped combs. The uncapped extra boxes on each hive contained mostly goldenrod nectar. Since the weather was continuing towards that "record rainfall year" the nectar flow was sporadic. I decided to leave any uncapped supers on the hives knowing that they would move the nectar back down for feed.

Removing the honey supers was

uneventful. My yard location was near a construction area parking lot. Of course, just as soon as I set a date to remove my crop the activity level jumped. Not wanting to create any major disturbance to the bees, I decided to use triangle escape boards. This along with the nectar flow still going helped me keep the hive disturbance to a minimum. None of the "non-beekeeper" types was stung, and except for the few who saw me dragging out supers, no one knew the beeyard was there.

Once at home I place the supers in an enclosed room. This room is heated and there is a dehumidifier always left on. The supers are stacked with air space at the bottom and a small fan at the top to pull the air through the stack. Result is that by extracting time the honey has warmed to around 90° and it flows quite well.

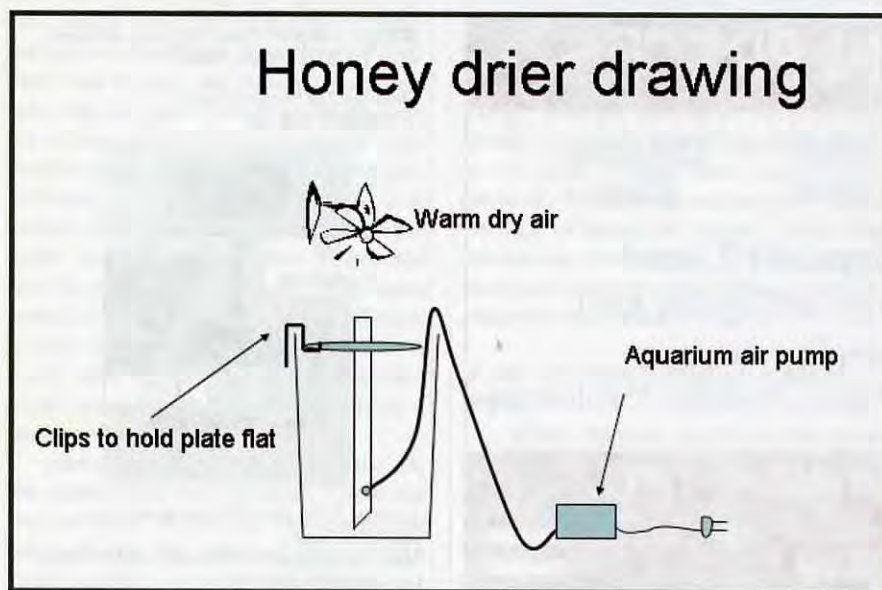
Prior to extracting, I like to monitor the air's humidity in my en-

closed room and the amount of water that the dehumidifier was removing each day. I felt confident that after four days the honey would have an acceptable moisture level. How wrong I was! Two weeks after finishing I had the honey tested. It came in at a range of 19 to 22.2% water. Well above the 18.6% level considered the maximum for honey. So now I had 530 pounds of filtered "near honey" in five gallon pails. For a person that is used to seeing 16 to 18% on an average crop this was shocking!

I spent some time discussing my options with other beekeepers at our Minnesota Hobby Beekeepers monthly meeting. Suggestions abounded. The one thing missing was an easy way to remove the moisture that would not cost an arm and a leg or result in me suddenly having three times as much honey!

The internet provided scarce information. All I found was a com-

Honey drier drawing



mercial dehydrator unit for honey and a reference to a person in Florida that was using an aquarium pump to move honey around for a drier system in barrels. Bingo! The light went on! I now had a simple way to pump the honey, if it worked.

When the bees dry down nectar, they evaporate lots of water in the process. Their method is simple, less humid air into the hive, more humid air out. I wanted to mimic the same mechanism and not create some kind of "Rube Goldberg" contraption. Ideally, it would be nice not to remove the honey from the buckets I extracted into, less mess, less handling.

The honey drier unit consists of a 14" piece of 1 1/4" diameter PVC pipe, a lid off a 2-gallon pail and a 20-gallon aquarium pump. The diagrams show how simple the construction is.

You want the wire support pieces that hold the lid to be as close to identical as possible. This assures that the lid will remain in the center of the pail and "flat" so the honey can spread out evenly. For a uniform fit, they should all be identical. I made these out of coat hanger wire.

To hold the lid in place I cut a straight coupler in half, filed out the center to allow the pipe to force fit through it. The two halves of the coupler sandwich the lid and I found there was no need to cement the lid in place.

Constructing the main "stem" is straightforward. You want to cut the lower end at a 45-degree angle. This cut allows the honey to be easily withdrawn from the bottom of the bucket and the point establishes a resting place for the pipe. Above the top of the cut, I drilled the entrance hole for the tubing from the pump. You should insert the air supply tubing just past the pipe material. An electronic "cable tie" holds the tubing to the pipe.

Operation requires a compressed air flow. It should be sufficient to slowly bubble up the honey through the stem tube. I purchased a 20-gallon tank aquarium pump and found it adequate. The compressed air entering the bottom of the 1 1/4" pipe forces up the trapped honey and it literally just "percolates" In order not to contaminate the honey, the pump needs to be placed in a



clean and odor free area. Inside the heating box worked just fine. I found that in order to get proper "percolator" action I needed to have about 3/4 of a bucket of honey. More is OK, but less will not allow for any flow from the supply pipe.

I have an old "small" refrigerator that I salvaged to become my honey-heating box. I use it to reliquefy pails, jars or dry pollen. The heat source is a thermostatically controlled fan/heater unit. In the back of the box, I have cut in an upper and lower four-inch diameter hole. Both openings have a screening to filter the airflow. During use, the heater's position is next to the lower opening to draw in room air. On the top inside wall, I mounted a small fan that blows down; this moves the air towards the honey bucket during operation. This has been a very versatile and handy item to have and is an important part of this overall system to dry honey.

The advantage of heating the air is twofold. First, warm air holds more moisture which makes for a quicker evaporation of the water from the exposed honey. Second, there is a tendency for pockets of unheated honey, trapped in the bucket not to circulate through the pipe. This means that you will end up with some of the pail being low moisture honey and some still at the original level. A good stirring before taking a refractometer reading will eliminate any question as to the real value.

The honey remained in the same five-gallon buckets I extracted into and allowed me to keep the floral sources intact. One thing you can expect is some foaming and many bubbles incorporated into the drier honey. I considered this a small

trade off. My customers seem to respond well to "having such a thick bodied honey that it won't allow bubbles to rise" It's worthwhile (at least once) to take a sample of the before and after honey. Put them in small jars then do the "bubble race" You'll be shocked at what a few percentage points of moisture results in!

My drawing details the construction of how I put my system together. Your requirements may call for changes in the overall dimensions and I encourage you to try it. Like most everything else in beekeeping there are more ways to do things than beekeepers. This system worked and I did not spend time evaluating improvements.

It took a few weeks to dry out my crop. I am happy to say that the moisture level has been reduced to 18.6% or less (including the refractometer error). Most pails took 24 hours to bring down the moisture to an acceptable level. On the extreme running, the set-up for 56 hours brought a 19.2% pail down to 15.4% moisture.

It would be nice if we all had the assurance that high moisture capped honey is something we will never experience, I always thought so. I am still amazed at how well this device worked, saving my entire crop from what certainly would have been a disaster. **BC**

Scott is a fourth generation beekeeper who returned to it as a hobby 15 years ago. When not keeping bees his days are occupied by his job as Chief Transmission Engineer for Twin Cities Public Television. There is good watching on both sides. Scott is available via e-mail at: sholisky@tpt.org or phone at: 651 402-8849.

ORGANIC HONEY

Know The Details, and Keep Good Records. And It's Still Location, Location, Location.

Kim Flottum

If I were to ask you to define organic agriculture, you'd probably give an acceptable definition, hitting most of the big points, and some of the fuzzier, more esoteric concepts. More than three quarters of us garden to one degree or another, and we all keep bees. Who better to understand the 'all natural' lifestyle, even if we don't practice it religiously?

But now there is an official USDA definition for 'organic' and the difference between what most of us think and what actually is amounts to a stack of paper nearly three feet tall. Though not terribly complex or difficult to understand the detail involved, and the sheer amount of information to absorb can be daunting. This is, we're told, a necessary evil, to maintain the integrity of the term 'Organic.'

Recently, you or someone you know has probably seen a jar of "Organic Honey" on a shelf somewhere.

Can this be? For years when asked if the beekeeping industry could produce organic honey in the U.S., the stock answer has been, "Define Organic." Well, now we can define organic honey, and yes, it can be produced in the U.S. More easily, I suspect, than you first imagined, but more difficult, I again suspect, than any of us could imagine.

There are, to produce organic honey, basically four components to the program: 1) where your bees are and where they forage; 2) how you manage them including housing and pest/disease control; 3) how you handle the crop, including harvesting and storage; and, 4) labeling. A fifth component should be added I suppose, and that's the record keeping system you'll need to employ to document absolutely everything you do.

This record keeping, plus your application, and perhaps surprise visits will be duly noted, and judged, and recorded by a certifying agent who works for an organization that has passed USDA muster as being able to determine if your operation meets the requirements for organic production. Currently there are 80 or so certification organizations operating, and another 200 or so are pending approval. This number will surely increase as organic operations of all types increase. But all certifiers are not cleared for certifying all types of organic operations. For instance, certifiers specializing in grain production may not have expertise in evaluating a poultry, or beekeeping operation. Large certifying businesses tend to have most of the skills necessary to certify most types of operations. Those

that work most with beekeepers are the livestock people, who operate under those regulations. Your bees, with very few exceptions, are considered livestock, and your operation is evaluated accordingly.

Another consideration is the size of your operation. If you produce less than \$5,000.00 per year of organic products (all types, any product), you will come in under the wire for some of the record keeping and certifying requirements and get to use the label. Not many though. And, if you are challenged, you will have to be able to document your operations. Income from non-organic products sold do not contribute to this amount, so you may run a large operation concurrently. But be careful. On average, this total would come from fewer than 20 colonies, producing about 60 pounds of honey apiece. Each pound produced selling for \$4.00

(average wholesale and retail price). Production and prices will vary, but this amounts to, at most, only a couple of yards dedicated to this practice. You may, however, engage in producing organic pollen or beeswax (cosmetics cannot be labeled organic, so don't bother trying that). These additional crops may change the equation on colonies operated and total income.

FIRST To begin, you need a plan. A well thought out document that explains in detail how you will attain, and maintain your organic status. If you are careful, and thorough, this exercise will solve many problems before they arise, which is the purpose. For instance, how will you handle *Varroa*, where will you obtain organically produced wax foundation, and how close is that landfill, somewhere in the next township.

Before you even begin to develop your plan, locate a certifying agent or organization (see the USDA web page at end of this article). They will provide the background and guidance you'll need to produce your plan. The better agents provide a worksheet that takes you through your operation and the season, asking questions along the way. If you can't answer a question, they usually provide help.

You will invest significant dollars in becoming certified – both the fee (which is determined by the size of your operation and the number of crops you are producing), and the investment in changing the way you do things. Don't assume you know it all. You don't.

WHERE THEY FLY Location is going to be the most challenging hurdle for most beekeepers. Your plan re-



quires a map of where your organic honey-producing colonies will reside, and, if you move them mid-season, where then they will sit later. Basically your bees must always have sufficient organic forage. Regulations specify that within the area surrounding your hives – a flexible circle extending about two miles in every direction – your bees must not encounter a whole host of man-made obstacles. These include, but are not limited to urban centers, landfills, cultivated (non-organic) crops routinely fertilized or chemically treated, golf courses and industrial facilities. Genetically modified planting areas must be avoided, and further, they require a significant buffer zone to avoid contamination with wild or organic forage. Roads, large and small municipal boundaries, and water sources are needed too, and don't forget prevailing wind direction and all water sources. These man-made obstacles will need to be identified, but may not, in and of themselves, pose an 'organic' problems. The fundamental guideline is, are your bees foraging on organically grown plants, or wild plants that qualify?

Plants blooming during the season within the area must be indicated on your plan, and government agencies and other owners in charge of the land, plus the acres your bees will cover need to be noted. There's more, so don't skip this very important requirement.

There's no doubt that when you finish this part of your plan you will know more about your honey sources than you probably ever did, and, with a bit of preparation, could begin producing organic varietal honey. Now *that* would be a premium crop.

Your bees are free to roam on any crops or wild flowers that grow on land that has not had prohibited materials (synthetic fertilizers, herbicides, pesticides or sludge) applied in the previous three years. With few exceptions this excludes pretty much all active farm land, and essentially all urban and suburban areas. Not all, but a lot.

There are great areas of conservation reserve land that meet this requirement in many states. Far more in the Midwest, mountains and west than east of the Mississippi, though. But there are large tracts in the eastern mountainous areas and other spots that fill the bill. Providing that is, you can isolate your bees to those acres. USDA maps are on the web, or check your nearest Extension outlet.

You'll need to prove the status of all the land within your flight circle for your plan – owners or managers – and history, too. You can see that the western slope of the Rockies is probably a better bet than pretty much anywhere in New England, and easier to deal with for records. But don't give up before you look.

WHERE THEY LIVE The boxes your bees live in, should you choose this mission, will be just a little different, too. All natural, for all items in contact with the bees all the time. Using any preservative other than an oil based plant on the outside is out, by the way. Stains and other preservatives can't be used, nor can paraffin dipping. But, organic beeswax dipping would be, if you've a mind and lots of wax. Frames are wood only, and wax foundation, organic wax foundation, is

required. Plastic's out.

The organic wax foundation part of this poses the greatest change. Not available at your nearest Wal-Mart, or even any national bee supply company, you'll need to be creative here. Wired frames with starter strips of home-made organically-produced wax is the way many will start. But where do you get those initial blocks of wax to melt down, roll or pour and then emboss? Molds are available, mostly made in Europe, and a couple roller companies exist in the U.S. An entrepreneur with some marketing savvy and initiative has an opening here, for certain.

The caveat, however, is being able to document the source of the wax (invoices) and making certain that the source was, indeed, operating as a certified organic producer. Someone will ask, and you better have the paperwork. And, there is a whole list of requirements you'll need to meet to insure that organic wax and regular wax don't become co-mingled. (The same holds true for honey produced.) Remember, all this is in your plan.

MANAGEMENT Let's begin at the beginning. Organic bees. Who has organic bees? I don't. Nobody I know does. Yet. But you can produce your own, you know. And, for starters you'll probably have to. The queen's gotta be organically raised, too. Not a lot of those for sale, are there? You'll need to think that one through.

So to begin producing organic honey, you'll need to back up and first produce organic bees to produce the honey. I imagine you'll have to start an organic colony with inorganic (unorganic?) bees, but then manage them organically. Produce a queen(s) from that colony and then introduce her to yet another colony you've been raising organically, so the two mesh. This seems to be a chicken/egg thing, and though it sounds confusing, it's just time consuming. And a real pain for the paperwork. Don't forget the paperwork that documents all this. Ever.

These initial colonies will probably be used mostly for wax production for additional colonies *next* season. It seems clear that you'll need to invest a season's preparation to get all this going. Maybe more, maybe less if you don't have long Winters.

So, to move the plot along, let's imagine you have a dozen colonies set up with the right equipment, setting in the right place, living with the right indoor/outdoor furniture, and everybody has been organically produced. And, *and*, you've documented it all – i's dotted and t's crossed.

Record keeping gets kicked up a notch now. Every inspection recorded. Every one. Don't forget. What will you find? The same stuff, mostly. The same old problems will appear. Here's the scoop. To stay organic, no drugs. None. So management, specifically integrated pest management will become your best friend. American foulbrood – burn. Just a frame, maybe a super, maybe a hive. *NO* terra allowed (but see below). European foulbrood and chalk, requeen (yeah, right!), or oth-

Continued on Next Page



erwise reduce stress. Perhaps feed (see below for that item). Grease patties are allowed (the use of these is a bit fuzzy – does the Crisco® need to be organic, since bees don't actually eat the grease?), but sweetener (sugar or honey) needs to be organically produced. Fumigillone isn't allowed either. And certainly not Apistan or Checkmite+. Menthol is, though.

For *Varroa* there's nothing. Yet. There are, however, as of late July three products on, or near the market that are going to make *Varroa* control possible. ApiLifeVar has a Section 18 in several states already, with more on the way. I'm told every ingredient – menthol, thymol, eucalyptol and camphor – are allowed individually. The newest treatment – Sucrose Octanoate – would also be allowed, as would ApiGard – Thymol – when (and if) it is released in the next year or so. The only hurdle to all of these is that to date they have not been approved to use in an organically run operation. To remove this obstacle, the Eastern Apicultural Society is beginning the petition phase to get these approved. Stay tuned.

All three of these will almost certainly be approved to use in a hive to control *Varroa* (but, recall only two things are certain). Once that happens, even though all three treatments are labor heavy, maintaining a (nearly) chemical-free, (almost) *Varroa*-free colony is economically feasible.

But with the chemical mind-set we currently have, alternatives are often given second status. That needs to change. The mechanical methods used need to be explored even further. Screened bottom boards, increased ventilation, and isolation from infected colonies all need to be increased. Certainly, the standards of maintaining healthy colonies need attention – plenty of (organically approved) food and water, protection from the common pests – ants, skunks and other nasties, feeding if necessary (and it will be sometimes) with organic pollen (you collected some *last* season, right?)

and sugar (honey better, and only you have it) to avoid problems all the things you've been doing for years to reduce stress, and thus disease susceptibility.

A big part of this must be the introduction of stock resistant to the three pests – AFB, *Varroa* and Tracheal mites. Hygienic, SMR and Russian-stock will blossom, I suspect. And new introductions will have a market if they indeed do what they're supposed to.

There's an additional point that needs to be made, and it's important. You can't let a colony just die. If you have a sick colony, and need to save it in a hurry, you *must* pull it out of organic production and treat with the traditional chemicals – according to label instructions – and use the honey harvested for other uses. Again, if organically approved methods don't work, you *must* resort to stronger, more effective measures, regardless of the status of the colony.

I'll bet there's a benefit here that you haven't picked

up on. An organically raised queen, and supposedly drones, will not have had the opportunity for *any* exposure to chemicals during their formative weeks. And later, when you introduce that queen (your own or someone else's) to your hive, she'll be walking into a virtually synthetic-chemical-free environment. This double exposure in the past has been blamed for poor queens, poor drones, and significant supercedure problems. We should see fewer problems along those lines. C.C. Miller would approve of these procedures, I think.

So. You've got healthy organic bees, living in organic boxes, traveling to organic-only fields and producing organic honey. Getting it is next. Removing involves brushing, escapes or blowing. Repellents aren't allowed (BeeQuick may be the exception here, pending the outcome of their petition to use a 'certified organic' label). But first, let's take a look at where you're taking these frames of honey, and what you'll do with them.

Your extraction environment (I realize most of us don't have dedicated honey houses) needs to be pest free, primarily due to your diligent efforts to keep pests out with barriers and good maintenance. For those that do get in (I'm thinking mostly mice here), controls need to be, yes, organic. No poisons, or the like, can be used that will affect the honey. Prevent first, control later if necessary is the word.

Uncapping (cold knives if possible, low heat if not) procedures and machines need to be documented. Everything's stainless of course. Transport (pipes need to be food grade) and heating should be monitored, and documented. Anything over 110°F can't be called raw, and intermediate and storage containers need to be up to snuff – but you were already doing that, right?

If you've done all of the above successfully, been certified (or are too small to be certified), you can now, officially, label your product "100% Organic." The USDA has an official logo you can use. You've done the work, paid the price and sweated the details – get your money's worth.

If you are producing honey only, the "100% Organic" label fits. However, if you are doing flavored, or fruit-added creamed honey, those products must be considered. There is a whole section on labeling in the regulations you'll need to be aware of, and comply with. Read carefully because your label, too, needs to pass muster for the organic people, and the usual state and federal requirements haven't gone away. Moreover, some states have their own organic regulations that will need attention. Some states, too, are the only certifiers, so by dealing with them you should have taken care of everything.

The demand for "organic" is increasing at an alarming rate. If you can, it's worth the effort.

I started this by describing a stack of paper three feet tall. That much information isn't in this article. I haven't touched the handling, wholesale and retail



marketing requirements, the 'National List' of approved chemicals, and a hundred other items. The initial plan you put together, and the documentation required afterwards were strongly mentioned. Not, however, strongly enough. The people who certify you have a standard to uphold, and a boss that makes them tow the line. *They will be thorough.* You absolutely need to do your homework before you begin this.

An alternative organization exists, realizing that some operations that honestly try to obtain 'Organic' status cannot do so for a variety of reasons. Meant for small farmers distributing through local channels - farmer's markets, roadside stands and the like - this approach reduces the paperwork required, but maintains all the standards of the USDA's program. It is called 'Certified Naturally Grown,' and so far has a foot in the door for recognition. *Bee Culture* is working with this organization to develop standards that reflect the quality control of USDA, and the reality of a sideline beekeeper's operation and resources. By next season these should be available. In the mean time, check out 'Naturally Grown' at www.naturallygrown.org for additional information.

Another topic that may rise to the surface is "just because we say it's organic, does everybody believe us?" Well, not quite, not yet. Everybody has their own standards, it seems. The EU, Canada, U.S., London, Italy all similar, but all different. Right now, these primarily cultural differences are being ironed out. There may be, one day, a universal standard. Maybe.

What if you flat out lie? You said it was organic, but you mixed in a couple barrels of something else, so you could fill that big order. Well, if you're caught, and you probably will be because of the competitive market this stuff will have, the fine is \$10,000. And a bee sting on your nose. Shame on you, anyway.

And finally, there is a group of people who are making all this work for USDA. The National Organic Standards Board officially develops the standards for substances to be used in organic production and advises the Secretary on the implementation of the program.

Chosen for expertise, skills and because they raised their hand, these people deal with stacks of paper yards high. Beekeeping is fortunate in that one of these people is Nancy Ostiguy, from Penn State, familiar to many for her work with *Varroa* mite control. She was helpful in producing this article by explaining some of the 'whys' and 'hows.'

Producing "Organic," or even "Naturally Produced" honey, pollen or wax isn't going to be for everyone. But it will be a lucrative niche market to exploit for those with the resources and location. But don't discount it before you explore the requirements. You may be surprised.

For all of the information on the USDA National Organic Program, go to www.usda.gov. Click on agencies, find AMS under Marketing and Regulatory Programs on the right hand side of the screen. There, you'll see 'National Organic Program.' Then sit back, relax and enjoy all the thousands of pages of information that will amaze and delight you. **BC**



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AN OUTDOOR EXHIBIT



James E. Tew

Interacting with the Public

Across the U.S., beekeeping has declined during recent years. It's not just beekeeping. Many aspects of our former rural lives have declined as people have become more and more urbanized. Beekeeping will survive, but that is another article for another time. Even though our numbers are not as great as they once were, isn't it strange how enticing a bee exhibit can be at a public gathering? Kids, adults, beekeepers, all stop by for a look. Old people reminisce about the bees their parents had. People who are firmly convinced that they have life-threatening allergies stop by. Bottom line – many, many people are intrigued by bees, but few of them take the step of becoming a beekeeper. Public events, where we as beekeepers talk to people who are not beekeepers, are invaluable recruitment programs. They are also a good deal of work.

The Event

The Event ended yesterday at 6:00 PM. It lasted 2 ½ days. We do it every two to five years – depending on funding. I'm still tired. I have modest lower back pain from so much standing and I really should not have mixed the large root beer float with the pork loin sandwich. But, I will survive. It was a good event for beekeeping and for my program at Ohio State.

Right up front, I want to say thanks to the Ohio State Beekeepers, the Tri-County Beekeepers of Ohio, and to the staff of *Bee Culture* magazine for all their help. My small staff and I could never have pulled off this event (for the fourth time) without so much help.

The Ohio State Beekeepers

My bee laboratory is on the campus of The Ohio Agricultural Research and Development Center at Wooster, Ohio. It is a large agricultural research facility neighbored by the Agricultural Technical Institute (ATI), a two-year school that, for many years, offered a commercial beekeeping training program. There is an 85-acre arboretum and we maintain a respectable honey bee equipment museum at the facility.

The event has been named *BiOhio* and is a general showcase for Ohio State agricultural research programs, for ATI, and for the arboretum. But there is also much for families and kids to do besides review research projects. Insect zoos, fun-science, trailer rides behind farm tractors, bird watching walks, face painting, art exhibits, quilting, and singing and clogging groups are some of the activities for kids and families. The weather was perfect. This was the setting for our beekeeping exhibit.

The Summer meeting of the Ohio State Beekeepers' Association (OSBA) was held in conjunction with the BioHio event. After Friday night

and Saturday morning sessions, OSBA participants attended the various events and helped in the tent with the constant flow of questions. Ms. Kim Lehman, beekeeper and educator, was a visiting speaker for OSBA and helped with the children's sessions. So we had the public and we had experienced beekeepers and teachers participate in the event.

Our setup

Our setup was composed of three tents and our bee garden. The largest tent was for the main exhibit. Across the street, we had a small tent for our honey sale operation; and, thanks to the Medina County Beekeepers of Ohio, we had a screened dining canopy for our open hive demonstration. The bee garden was located a trailer ride away, but was a primary part of our exhibit. This is the truth....I intentionally made the following photos when *few* people were in the area. You would not have been able to see the layout with the full press of people in the photos.



Part of the main tent. The bee cage is in the background.



The observation hive is always a hit.

The main tent

The main tent was 30 x 40 with two sides used. We used it for general exhibitions for the public and experienced beekeepers. The tent was divided into categories with exhibits for pollination, products from the hive, diseases, honey, hive equipment, and bees other than honey bees. This tent was also the exhibit area for the observation hive.

Our observation hive

Nicely stocked observation hives are a guaranteed success at events like this one. In the observation hive shown, I used a chainsaw to level a limb crotch of an ash tree that was destined to become firewood. Using the same saw, I hollowed a larger section of

the tree and used it as the base. It made a novel, but heavy base for our observation hive exhibit.

We have a short length of clear plastic tubing that measures about one inch in diameter. Simply holding the tube in one of the screened vent holes in the observation hive “telephones” the sound of the buzzing bees right to the ear of the listener. The response of the listener is always amusing – kids especially. It sounds as though the bees are right in your ear so there is the predictable flinch upon hearing bees so near. Asking the parents to do it first is usually a good idea.

Candle-rolling

Editor Kim, from *Bee Culture*, suggested that we offer candle-rolling for kids – or adults, too, for that matter. This simple procedure was very successful. Kids were frequently lined up. We charged one dollar for ½ sheet of colored beeswax. Kids could roll two small candles or one larger double candle. While not a major money-maker, it was enjoyable and we did way more than break even on the cost.

The Honey Sale Tent

We have been selling OSU honey on the campus for many years. We have a diversified product line that has been well received by students, staff, and faculty. Though none of us will retire on the income generated from the sale, we do make enough to keep our old truck running and buy needed hive supplies.

Unintentionally, we did a good marketing thing. Just after the open

hive demonstration would end, the presenter would comment that honey produced by OSU bees – like these you just saw – is for sale just across the street. There for the next few minutes would be a small mob at the honey tent – money in hand wanting honey sticks and liquid honey. We now can take charge cards so our little honey tent is somewhat modern.

The Open-Hive Demonstration

As popular as the observation hive, open hive demonstrations always attract a crowd. Starting at 10:00 a.m., we did one every two hours. If a large enough group showed up, we would run a special show. People seemed enthralled.

Honestly, I suppose I should feel a bit guilty. We used a two-deep colony, but the bottom deep was completely empty. The top deep had mostly young bees with a marked queen. I was certain to put in enough drones to entertain people with “stingless” honey bees. These demonstrations were well received.

We taught a lot, but we learned a lot From the public

1. The public knows that bees sting – period. Nothing else to say about that.
2. The public has not forgotten killer bees. They want an update and some explanation of what that whole episode was all about.
3. The public knows about the mite problem. While most people do not want to keep bees and surely do not want to be stung, they never really wanted all bees to die.
4. The public knows that honey is a delectable food, but most people don't eat all that much. Many people do not understand the process of crystallization thinking that honey has gone bad once it “sugars.”
5. The public knows that bees are primary pollinators, but they are not sure what the bees and plants do for each other.
6. Some people:
 - a. Are concerned about genetically modified plants
 - b. Wonder if eating honey helps allergies
 - c. Want bees in and around



The honey sale display.

their garden, but they don't really want to keep bees
d. Are interested in bees other than honey bees

The bee cage used for the open hive demonstration.



From the beekeepers

1. Beekeepers commonly reported winter kills. Too many? I don't know, but it was a common topic.
2. Beekeepers commonly reported queen maladies. Queens didn't perform well, queens died, queens were quickly superseded. In general, there was common - albeit low level - unhappiness with queens.
3. In this area, beekeepers are not predicting an outstanding honey crop. But there has not been an outstanding honey crop in this area in many years.
4. Beekeepers tolerate, but in no way, like *Varroa* mites. Many beekeepers wanted to discuss current control methods while others have novel control suggestions. One beekeeper reported an unintentional way that a modified bottom board would harbor carpenter ants beneath the screened bottom board. He felt that the ants were eating the *Varroa* that dropped. I have not had the time to de-

termine what carpenter ants eat.

5. Beekeepers like to look at different kinds of hive equipment.
6. As much as ever, beekeepers love to talk about bees - especially swarms. Some things never change.

Finally...

Did this public beekeeping event bring any new beekeepers to our fold? I don't know, but we did a good job of supporting the beekeepers who are already in the group. We reassured the public and we looked

pretty good compared to the other exhibits (so I looked good with my bosses.) It was lots of work, not much monetary income and no immediate converts to beekeeping, but I will do these events every chance I get. It's a great way to interact with the public. **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/

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Queen Rearing At Its Best

Past Pieces

The Root-Corey Cold Blast Smoker



Wyatt Mangum

In the previous article, we learned how A. I. Root sought to improve his Simplicity smoker. He wanted one that could be refueled without removing a hot funnel. And to further complicate matters, he had to avoid Bingham's direct draft patent. Bingham had met with Root, informing him that his first Simplicity smoker was an infringement on his patent. Root, clearly upset, decided voluntarily to halt production of his first Simplicity. Part of Root's next design called for extending the blast tube a little ways into the firebox. This arrangement still allowed for a passive airflow, that seemingly unavoidable but critical feature of Bingham's claim. Thus the nagging infringement problem remained.

Then came a remarkable letter from Corey offering a modification of Root's smoker. Most notably, the blast tube extended completely through the fuel, literally building on Root's idea. Because of the timing, I doubt Corey knew of Root's newly modified Simplicity; however, it's an interesting "addition of thoughts," even though Corey had other reasons in mind. He wanted cooler smoke, better conservation of fuel, and to rescue Root from his prickly patent problem. Furthermore, in a profound act of generosity, Corey gave the idea of his smoker, based on the cold blast principle, freely to the beekeepers of the country so anyone could copy it.

Root, clearly pleased and uplifted, wrote in the March 1879 *Gleanings in Bee Culture*, just a month following the publication of

Corey's letter,

"Orders came in for the cold blast smokers, almost before - as it seemed - the Feb. No. could have reached you. A Simplicity smoker, on the cold blast plan, was ready to send out about as soon as the orders came, and it is so much ahead of any of our former Simplifications that I can but regard friend Bingham's visit, as a special providence."

Given Root's anguish over Bingham's patent claims, this is

The Simplicity Cold Blast Smoker. The most prominent external feature is the large side hole and the circular slide with a wooden handle.



indeed a surprising turn of events. Although delighted with Corey's smoker contribution, Root had to mass-produce them at a reasonable cost. Simplifications were needed, keeping in mind Root's original goal of safe refueling. Figure 1 shows his new design.

The original Corey smoker had a narrow rotating iron ring around the base of the smoker with numerous small holes in the ring. Another set of little holes surrounded the base of the smoker. By turning the ring, and aligning the holes, one could adjust the airflow. This part of the smoker worked an adjustable damper. However, Root simplified the ring's construction, and in a clever innovation, made it perform two jobs. Using a strip of tin, he made the ring wider and put in one large hole matching another in the side of the smoker. Now the smoker could be refueled from the side, a most novel feature. A small wooden handle allowed the beekeeper to turn the ring, to open and close the hole, without the risk of burns.

The funnel was still removable, letting the beekeeper start the fire as before. When the funnel became hot, the smoker was safely refueled from the side. To set the draft, which kept the fire alive, a small circular notch in the lower side of the ring was alighted over the large hole. On a windy day, exposing the entire notch to the fire could let in too much air, thereby burning the fuel too quickly. To reduce the draft, the ring was turned a little more, so the notch was only partly exposed. So essentially Root kept the

Continued on Next Page
49

adjustable damper from Corey's original design.

Now let's look inside the smoker. With the funnel removed, Figure 2 shows the prominent cold blast tube projecting up through the firebox, extending well up into the funnel. By today's standards, it's most unusual. A blast of air from the tube creates a vacuum in the upper part of the funnel, drawing up the smoke from the fire below. The two mix, giving a cooler puff of smoke, or to put it more dramatically, particularly for advertising, a cold blast of smoke.

The fire in the base of the smoker formed a ring around the blast tube. Given this arrangement and the smoker's small size, starting the fire and keeping it lit would seem problematic. However in the study of old smokers, one must consider the fuel chosen by the beekeeper. In his smoker, Corey recommended cotton rags, coiled in a roll around the blast tube. Even a small quantity of cotton can smolder for an exceptionally long time, making this fuel compatible with the smoker's design. Also in the old bee literature, mention is made of the cost of old cotton rags, so the fuel economy of the cold blast smoker would be advantageous.

In addition to the cold blast principle, Corey made a crucial contribution to the bellows of Root's newly redesigned smoker. Remember the original Quinby smoker had



The internal construction of the Simplicity Cold Blast Smoker. Look at that slender blast tube! Have you ever seen anything like that inside a smoker?

a complicated tin valve in the bellows to allow the air to refill them. In contrast, with the original hot-blast Simplicity design, the bellows lacked a valve. The air had to enter the bellows from the same hole used to inject it into the firebox. This hole and the one in the firebox were only about a quarter of an inch apart. Upon expanding, ash and hot gases were pulled into the bellows. In his letter to Root, Corey explained the long term consequences of having no valve in the bellows,

“... in supplying itself with air

from a point so near the fuel, it inhaled smoke, which caused an accumulation of soot in the bellows, and during a long honey season of 60 to 90 days, in large apiaries, it became disabled; the leather got black and hard, and it failed.” (We will see problems similar to this one with a few other smokers in future articles.)

To remedy this unforeseen problem, Corey proposed a simple yet highly effective valve, a Simplicity valve, as he called it. He cut two small holes through the backboard of the smoker, on the side opposite the firebox. On the inside of the board, he covered both holes with little pieces of soft leather tacked down at each corner. Leaving enough play in the leather allowed it to pucker slightly to let air in. Upon compressing the bellows, the leather flattened against the hole, sealing it. Corey's valve worked on the same principle as Quinby's, where positive and negative pressure within the bellows closed and opened the valve respectively. However, Corey's valve was much easier to mass-produce, a feature critical for Root.

Merely a month later, Root's April supply catalog included the "Simplicity Cold Blast Smoker." Imagine, as a beekeeper in 1879, having mailed off your hard-earned 75 cents, you waited anxiously for your smoker to arrive.

Then, after what seemed like an eternity, it came, perhaps in a wooden shipping box. Upon remov-

Lighting the Simplicity Cold Blast Smoker. It's a bit tricky to get the fire going and stuff the rag in the firebox without smothering the embers.



The Simplicity Cold Blast Smoker in action. It did not make the volume of smoke we are accustomed to seeing, but enough to control the bees. Also the smoker is a little awkward to handle, a concern voiced in the old bee literature.



ing the smoker, you admire its fine workmanship as the shiny new metal gleamed in the sunlight of that long ago imagined day. After working the ring and seeing how to reload the smoker, you remove the funnel. Wow, look at that blast tube right in the middle of where the fire will be. Of course, you would be eager to try it out, but first you must light it and learn to use it correctly. I wonder what that would be like? Though we cannot experience such imaginings first-hand, we can get a better appreciation what it would be like to fire up a Simplicity Cold-Blast Smoker for the first time.

A good friend of mine, Stephen Bambara at North Carolina State University, painstakingly made an exact replica of the smoker according to Root's instructions, and then donated it to my beekeeping museum. The instructions came from an 1881 edition of *The ABC of Beekeeping*. In Figure 3, I'm lighting the smoker, using a coil of old cotton rags like my beekeeping predecessors once did. In Figure 4, we see the smoker in action.

The Simplicity Cold-Blast

Smoker sold well for several years, though not for long. Soon another cold-blast smoker would appear, dominate the market, and relegate the poor Simplicity to obscurity. Though based on the same principle, this smoker, called Clark's cold-blast smoker, looked much different. In the next article, we will begin to rediscover the story of its rise and subsequent fall as our journey into our beekeeping heritage continues. **BC**

Acknowledgments

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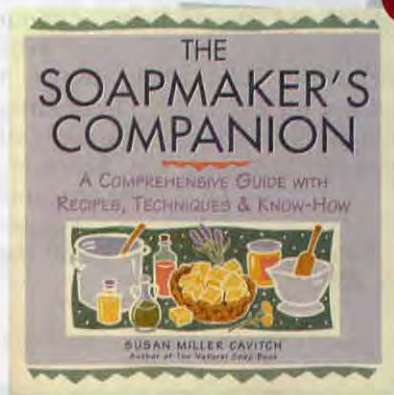
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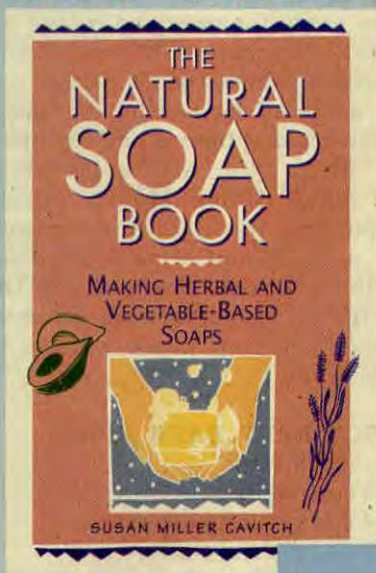


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Sugar & Honey Are Sweet

Ann Harman

*Roses are red,
Violets are blue.
Sugar is sweet,
And so are you.*

Well, this bit of doggerel by the most prolific of all writers, Anon, certainly describes sugar. When used in foods, sugar provides sweet but no flavor. This is actually not always bad. In some cases you may not want to mask or interfere with the taste of a particular recipe.

Sugar actually has some other good points when used in cooking. If a gingersnap is supposed to snap when eaten, it must be made with sugar. Sugar influences the texture of many baked goods. If you want a crisp cookie, sugar will give you that texture. A gingersnap made with honey will be a soft, bendable cookie so perhaps you should call that a ginger cookie so nobody will be disappointed when it does not snap. Some specialty cookies need to be made with sugar to be stiff and hold their shape.

A pie meringue, such as for lemon meringue pie, will last longer if made with sugar than one made with honey. Leftover pie with a sugar-based meringue will keep very well. Certainly you can make a meringue with honey. But during storage of leftover pie the honey meringue will weep and collapse. Yes, it not only sounds sad, it is sad. The best thing to do with a honey-based meringue is to scrape it off the pie and make a fresh meringue when serving the leftovers.

Many cooks wish to substitute honey for sugar in favorite recipes.

You are quite safe making 1:1 substitutions in beverages, sauces, salad dressings, and ordinary yeast breads. Problems arise with cakes. Since sugar is responsible for texture, you may wish to invest in a honey cookbook where someone else has made the experimental messes with cake recipes using honey instead of sugar.

If Anon does not mind, we can easily revise the little poem to read: Roses are red, Violets are blue. Honey is sweet, And so are you.

Now let's see what honey can do in our cooking. Honey gives not only sweet but also *flavor*. The different flavors of honey allow us to choose the one we like best for a particular recipe. Orange blossom honey enhances fruits; dark, rich buckwheat works well in barbecue sauces; wildflower is for everything.

Honey mixes so quickly with other ingredients that creaming shortening and honey takes only a very short time. Salad dressings made with honey are not gritty. Baked goods stay moist and fresh longer.

But caution must be used with baked goods. Recipes containing honey will burn more easily than those using sugar. Nothing is worse than a cookie sheet full of beautiful golden brown cookies that are scorched and black on the bottom. Two things to keep in mind – pay attention to those cookies when they are in the oven and reduce the oven temperature by about 25°. Success with barbecue sauces can be achieved by adding the sauce when cooking time is half complete.

Since we are celebrating National Honey Month during September, we can invite our friends for a picnic and serve some really delicious ribs. Fortunately the recipe gives instructions for oven cooking so your picnic will not be rained out.

SPICY BABY BACK RIBS

Seasoned ribs:

- 1/4 cup paprika
- 1/4 cup ground chili powder
- 1/4 cup ground cumin
- 2 tablespoons salt
- 4-1/2 pounds baby back ribs

Honey glaze:

- 1/4 cup chopped garlic (about 15 cloves)

- 3 large jalapeño peppers, stemmed, seeded if desired
- 1 tablespoon ground cumin
- 3 tablespoons hot red pepper sauce, such as Tabasco®
- 1 cup freshly squeezed lime juice (10-12 limes)
- 1 teaspoon salt
- 1 cup honey

In a small bowl combine the rib seasoning. Pat the mixture evenly over the ribs, coating thoroughly. Place ribs in a large roasting pan and cover with plastic wrap. Refrigerate at least 2 hours, preferably overnight. Heat oven to 350°F. Add about 1/4 inch of water to bottom of pan with ribs. Bake uncovered for 45 minutes. Cover with foil and bake an additional 30 minutes. While ribs are cooking make the glaze. In a food processor or blender combine the garlic, peppers, cumin, pepper sauce, lime juice and salt. Process until pureed. Pour mixture in medium saucepan and stir in the honey. Cook over low heat for about 20 minutes, stirring constantly to avoid burning. The sauce will be a bit thinner than barbecue sauce. Turn up the oven to 450°. Coat the ribs with the glaze and bake 10 minutes per side, basting every 5 minutes. For charcoal grill, light coals, let burn to medium-hot, about 15 minutes. With a gas grill, turn burners to medium and let grill heat for about 5 minutes. Glaze the ribs thoroughly and cook about 5 minutes on each side, frequently brushing with additional glaze. Cut ribs apart and serve hot. Serves 4.

*From Mesa Mexicana
Milliken & Feniger*

Celebrate honey and enjoy the ribs. **BC**

Ann's ribs get cooked in Flint Hill, VA.



? DO YOU KNOW ?

Honey Bee Behavior

Clarence Collison

Mississippi State University



Beekeepers are extremely fortunate to have many excellent meetings and workshops available to them to learn more about their favorite insect, honey bees and the various ways to manage them. This Summer I had the opportunity to attend several of these meetings. Most recently, I returned from the Heartland Apicultural Society meeting in Midway, KY. Several presentations gave me ideas for questions for this month's column. Whether you are a beginner or an experienced

beekeeper, these meetings provide opportunities to increase your beekeeping knowledge in areas that you may be unfamiliar with and to exchange ideas on different ways of accomplishing the various management tasks that will improve your operation. In addition, you may become familiar with various types of equipment and books that are available from the vendor's displays.

Answer the following questions, to see how familiar you are with honey bee behavior and management.

The first nine questions are true or false. Place a T in front of the statement if entirely true and F if any part of the statement is incorrect. Each question is worth one point.

1. ___ It is relatively easy to introduce a new queen to a colony with laying workers.
2. ___ Queen replacement is an excellent method of swarm management.
3. ___ African honey bee swarms will take over European colonies.
4. ___ The greatest proportion of female adult *Varroa* mites within a colony are found in brood cells in mid-Summer.
5. ___ Dust formulations of pesticides are usually less hazardous to bees than sprays.
6. ___ Cold temperatures following late evening or night insecticide applications increase the hazard to bees.
7. ___ Related queens are easier to introduce than unrelated queens during the requeening process.
8. ___ Virgin queens introduced to a colony are more acceptable to workers than queens in the egg-laying condition.
9. ___ Yellow jackets in the Fall are a serious menace to the colony since they rob the hive of honey and brood.

Multiple Choice Questions (1 point each)

10. ___ Y-*Tex GuardStar*[®] contains:
 - A. 40% permethrin
 - B. 25% coumaphos
 - C. 30% fluvalinate
 - D. 40% pyrethrin
 - E. 25% malathion
11. ___ Y-*Tex GuardStar*[®] is labeled by the EPA to control:
 - A. Bee lice within a colony
 - B. Small hive beetle adults and larvae in the honey house
 - C. Control *Varroa* mites within a colony
 - D. Treat the soil around a hive to control small hive beetle pupae
 - E. Control fire ants within a colony

12. ___ Which group of bees within the colony population are most likely to be impacted by toxic pesticides being applied in the vicinity of the hive?
 - A. Nurse Bees
 - B. Guard Bees
 - C. Larvae
 - D. Field Bees
 - E. House Bees Handling Nectar and Pollen
13. ___ Which of the following characteristics would you least likely use to judge the quality of the queen?
 - A. Amount and pattern of brood
 - B. Size
 - C. Color
 - D. Nervousness on the comb when the colony is open
 - E. Temperament of the colony
14. While examining the brood nest you discover a queen cell with a hole in the side of it. How would you explain the presence of a hole and what caused it? (2 points)
15. Why will a laying queen in a colony without laying workers sometimes lay multiple eggs per cell? (1 point)
16. Why would it be wise for you to plan to requeen a new colony just recently established from a swarm that you had captured? (1 point)
17. Robbing is often a problem in the Fall. What are the primary conditions that initiate the robbing instinct? (2 points)
18. Name the two chemical repellents that are legal to use to remove bees from honey supers. (2 points)
19. After you have removed bees from honey supers using the bounce/brush technique, you notice that several of the honey cappings have tiny holes in them. How would you explain this? (1 point)
20. Name two situations that will keep a bee escape from effectively removing the bees from a honey super. (2 points)
21. When using fume boards and chemical repellents, how do you know if you have left your fume board on the hive too long? (1 point)

Answers On Next Page

?Do You Know? Answers

1. **False** It is almost impossible to requeen a laying worker colony. The laying workers develop a queenlike relationship with the rest of the bees and any introduced queen is normally killed.
2. **True** Swarming preparations involves the rearing of queen cells due to an insufficient supply of "queen substance" either due to lower production by the queen or inefficient distribution of "queen substance" because of a large population of bees and congestion within the brood area. Colonies headed by queens of the current year rarely swarm. Either removing the queen and destroying all queen cells but one or introducing a new queen will curtail swarming preparations, and stop them from swarming.
3. **True** As Africanized honey bee swarms migrate, they often enter weak European colonies, kill the European queen, and ultimately become Africanized since the Africanized queen replaces the European queen.
4. **True** *Varroa* mites begin to reproduce with the onset of brood rearing in the Spring and continues until Autumn. Reproduction of mites is limited only by the availability of brood. In the Summer, brood production and mite reproduction will be at a high level which means the highest proportion of adult female *Varroa* mites will be found in brood cells rather than on adult honey bees.
5. **False** Pesticide formulations vary significantly in their toxicity to bees. With few exceptions, pesticides applied as dusts are more hazardous to honey bees than those applied as sprays.
6. **True** The rate in which insecticide residues degrade in the environment is strongly influenced by temperature. Thus, cool temperatures increase the persistence of spray residues and increase the hazard to honey bees.
7. **True** Honey bees recognize their own queen and retain their ability to differentiate between her and another queen for about 24 hours. When given a choice between their own queen and a foreign queen, the bees always prefer their own. Queens who are genetically similar (related) and are in a similar physiological condition to the queen that was removed from the colony have a much higher probability of being accepted than totally unrelated queens.
8. **False** Introduction of virgin queens is very risky unless they are within a few hours of emergence. Bees will accept a queen the same age and in the same physiological condition as their own queen much more rapidly than they will one who is unlike their own.
9. **False** Yellow jackets in the temperate regions cease brood rearing in late Summer/early Fall, therefore they no longer need a source of protein derived from insects/animals to feed their young. Adult foraging behavior switches to a carbohydrate diet, thus yellow jackets often become a menace around honey bee hives, as they attempt to steal honey.
10. A) 40% permethrin
11. D) Treat the soil around a hive to control small hive beetle pupae
12. D) Field Bees
13. C) Color
14. A virgin queen within the colony has emerged from her queen cell and stung her rival sister before she emerged from her cell. When a virgin queen finds a capped queen cell, the virgin chews a hole in the side of the cell and stings the developing queen.
15. Mated queens laying multiple eggs per cell is an indication that the queen does not have adequate space to lay in, such as in a nucleus colony or observation hive.
16. Primary swarms are normally accompanied by the old queen of the parent colony from which the swarm issued. Therefore, it would be wise to replace her soon after the colony is established.
17. Lack of a honey flow (nectar dearth)
Exposed honey supply, combs of unripened honey or some form of sugar
18. Benzaldehyde (oil of almond)
Bee-Go[®] (butyric anhydride)
19. Tiny holes in honey cappings resulted from the use of too much smoke while the bees were being removed from the honey supers. Too much smoke may flavor the honey or cause the bees to begin cutting into the cell cappings to engorge with honey.
20. The bee escape is not recommended when temperatures do not drop at night or if there is any brood within the honey super since both high temperatures and the presence of brood will make the bee escape ineffective.
21. Fume boards have been left on the hive too long when you see thousands of bees pour out of the front entrance.

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.

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GLOBAL NEWS

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No Ads Allowed

BEEF BOARD BANNED

A federal appeals court ruled in July that cattle ranchers are deprived of their free-speech rights by a law that requires them to finance advertising campaigns.

The U.S. Court of Appeals for the Eighth Circuit upheld a lower court ruling against the collection of the fee of \$1 per head of cattle sold. The fee was authorized under the Beef Promotion and Research Act. Of 1985. The three-judge panel ruled that cattle producers have no way to avoid the fee, making it unconstitutional.

"Unlike fees charged for the use of recreational facilities or special taxes imposed on nonessential consumer products, the mandatory assessments at issue in the present case are directly linked to appellees' source of livelihood, and they have no meaningful op-

portunity to avoid these assessments," the court said in its ruling from St. Paul.

The decision is the latest case in which federal courts have issued conflicting rulings on government-sponsored programs for commodity promotions that are financed by farmers. There are 16 such programs, ranging from beef and pork to cotton and popcorn. They collect more than \$500 million a year, according to Agriculture Department figures.

"We are consulting with the U.S. Department of Justice to determine the next steps regarding this matter," Ann M. Venneman, the secretary of agriculture, said. "USDA regards such programs, when properly administered, as effective tools for market enhancement."

Nobody Got Hurt In PA or KS

SUMMER SPILLS

A truck overturned on a curve for the northbound ramp from Interstate 35 onto Interstate 435 in the Northland, KS. About 520 beehives spilled open.

No one was injured, police said. But the angry bees began stinging anyone who came close, including emergency personnel.

Rheuben Johnson's company, A-Bee's at Killcreek Farm of Olathe, was hired to clean up the hives and bees. Johnson specializes in handling bee and wasp problems. He and employees donned protective suits and waded into the bees, righting hives and collecting bees in bunches.

"It is just the most miserable job you can dream of," Johnson said. "There can be 300,000 bees in a pile, and slick stuff. You get them in a box any way you can. And they're unhappy."

Wearing the protective suit in the heat and humidity while hoisting hives weighing 60 to 100 pounds is tough, he said. At times he was walking on a layer of live bees 2 inches thick.

But even with the suits, he still gets stung. "I haven't been stung too much this time," Johnson said, "probably 15 to 20 times. I'm used to it, but it still hurts. If they get you around the eyes it really hurts."

One large truck load of bees was sent on its way about 6:30 a.m. the next day, he said. That was about half of the bees spilled. Most of the rest were expected to be collected and shipped to their destination by the next day.

"You'd be surprised how many people stop, get out of their car and walk up to us," Johnson said. "But once they figure out we're dealing

Continued on Next Page

FEDERATION HONEY SHOW FOR 2004

The Honey Show Committee is looking to expand the popular event for the 2004 Honey Show in Jacksonville, Fla., Jan. 14-17. Rules are being developed for Gift Basket category; they will be announced later.

The Best of Show entry in Kansas City was an artistic wax entry crafted by Liz Vaenoski of Clinton, Wis. < a beekeeper riding a motorcycle. Three different people won two first places each: Barry Conrad of Columbus, Ohio; J.M. Sikes of Richmond Hill, Ga.; and Liz Vaenoski. Thanks to all of those who entered.

Thanks also to the companies that sponsored the competition; the judges, and the Honey Show committee. Judges for the event were Ann Harmon and Bob Cole. The Honey Show committee consists of Sharon Gibbons as chairman, Ron Fischer, Mary Kettlewell, Elaine Holcombe, and Nancy Leber.

The first place winners received a plaque and a crystal honey pot or china skep ornament. All first place honey entries that were bottled in a Gamber Classic honey jar received a \$100 savings bond from Gamber Container.

The 2003 American Honey Show winners and class sponsors were:

Class A, Water White Honey – Sponsor: Sioux Honey Assn., 1. Joe Dunham, Eagle River, AL 2. Barry Conrad, Columbus, OH 3. Kenneth Voorhes, Papillion, NE
Class B, Extra White Honey – Sponsor: Dutch Gold Honey, Inc., 1. Don Schmidt, Greensburg, KS 2. Barry Conrad, Columbus, OH 3. Rick Sutton, Lancaster, KY.

Class C, White Honey – Sponsor: Mel-O Honey Co., 1. Jimmy Carmack, Birmingham, AL 2. Kenneth Voorhes, Papillion, NE 3. Glen Davis, Bates City, MO.

Class D, Extra Light Amber Honey

– Sponsor: Golden Heritage Foods, 1. Barry Conrad, Columbus, OH 2. Joe Dunham, Eagle River, AL 3. J.M. Sikes, Richmond Hill, GA.

Class E, Light Amber Honey – Sponsor: Ashurst's American Honey, 1. Barry Conrad, Columbus, OH 2. J. M. Sikes, Richmond Hill, GA 3. Sharon Gibbons, Ballwin, MO.

Class F, Amber Honey – Sponsor: Burleson's Honey, 1. Virginia Webb, Clarksville, GA 2. Rick Sutton, Lancaster, KY 3. Glen Davis, Bates City, MO.

Class G, Dark Honey – Sponsor: GloryBee Honey, 1. Rick Sutton, Lancaster, KY 2. Barry Conrad, Columbus, OH 3. Ray Nicholson, Wadena, MN.

Class H, Chunk Honey – Sponsor: The Speedy Bee, 1. J. M. Sikes, Richmond Hill, GA 2. Virginia Webb, Clarksville, GA.

Class I – Round Comb Sections – Sponsor: Ross Rounds, Inc., No Entry.

Class J, Comb Section Honey – Sponsor: Walter T. Kelley Co., No Entry.

Class K, Cut Comb Honey – Sponsor: Tropical Blossom Honey Co., 1. J. M. Sikes, Richmond Hill, GA.

Class L, Creamed Honey – Sponsor: Mann Lake Ltd., 1. Stephen Klein, Marshall, MN 2. Sharon Gibbons, Ballwin, MO 3. Rick Sutton, Lancaster, KY.

Class M, Beeswax Block – Natural – Sponsor: Dadant & Sons, 1. Andy Kettlewell, Greenfield, WI 2. Sharon Gibbons, Ballwin, MO, 3. Chris Gibbons, Columbus, Mo.

Class N, Beeswax Candles – Sponsor: Rossman Apiaries, 1. Liz Vaenoski, Clinton, WI 2. Sharon Gibbons, Ballwin, MO 3. Virginia Webb, Clarksville, GA.

Class O, Artistic Beeswax Sponsor: Mid-Con, 1. Liz Vaenoski, Clinton, WI 2. Sharon Gibbons, Ballwin, MO.

with honey bees, they're pretty quick to turn around."

Even when the hives are gathered, some bees will remain in the grass. Johnson said he will recommend that the fire department hose the area down to kill them so they don't cause problems for nearby residents, such as those at the Northgate Mobile Estates mobile home park.

"Most of the people who live there have been staying inside," said Claycomo Fire Chief Kurt Stephenson.

Still, no major problems from bee stings had been reported, Stephenson said. Most of the bees were staying near the highway at the spill site, he said.

Emergency crews aren't often overheard quoting the Bard.

But Fairview Township firefighters were moved to verse early in June when 100,000 honey bees escaped from their trailer on the Pennsylvania Turnpike just across the York County border in Lower Allen Township, Cumberland County, PA.

"They were saying it was a Shakespearean event," firefighter and engine-driver Steve Smith said. "You know 'To bee or not to bee, that is the question'."

Not to bee.

Smith and other firefighters were called to the scene to destroy the errant bees, on orders from the Pennsylvania Emergency Management Agency, state police said.

Troopers from the Highspire barracks said beekeeper Thomas Lee Cook of Hatfield, Montgomery County, was transporting several hives westbound when the trailer holding the bees detached from his minivan and bounced along the highway.

The bouncing irritated the honey bees, several of which stung Cook, police said.

Because of the number of loose, annoyed bees, troopers called PEMA for advice and were told to have firefighters destroy the bees because if they swarmed they could pose a danger to humans, police said.

"We used firefighting foam, the same foam we use for car fires," Smith said. "It inhibits the flow of oxygen, which is how it works on car fires."

Not too many firefighters ventured close enough to get a good look at the hives, said Smith.

"We were probably there about an hour, but a lot of us kept our distance," he said. "Someone who's been with the (fire) department for many years said this was a first."

After the bees were euthanized, the trailer was towed away and Cook drove off in his minivan, police said.

The turnpike was closed for 35 minutes.

OBITUARY

Darrell Jester of Jester Bee Company passed away May 18. He was 63 years old.

He was a retired elementary school administrator and a commercial beekeeper for many years. Darrell started keeping bees in 1963 with two colonies ordered from the Sears Catalog. Soon his hobby grew to over 2500 colonies. He was active in state and local beekeeper's associations and was an Executive Board Member of the American Honey Producer's during the 1980s, and a past Sioux Honey Association member. He has been unable to take part in these activities since the late 1980s because of the effects of Alzheimer's.

Mr. Jester is survived by his wife, Patricia and two sons, Christopher and Kevin and two grandchildren.

Across The U.S.

SAFE USE OF FORMIC ACID

Fact or Fiction? Different methods and principles of formic acid treatments.

Bill Ruzicka is a 63 year old commercial bee breeder. In search for a better formic acid treatment suitable for a commercial operation, he evaluated many existing methods of treatment and compiled a set of principles for successful treatment. Using this information, he developed the MiteGone disposable dispenser that evaporates a constant amount of acid over a long period of time. MiteGone fits in the available bee space in the hive, is adaptable to most climates and management conditions and is used to treat *Varroa* and Tracheal mites by evaporating Formic acid. On his way from Western Canada to Florida and back, he is willing to stop and visit your club or interested group of beekeepers to present a seminar on the safe use of formic acid as it is used in Canada, New Zealand, and around the world.

His tentative driving route and itinerary is as follows (side trips

and alternate routes are possible):

OCTOBER: From British Columbia to Spokane, then along the I-90 to Sioux Falls, then the I-29 to Kansas City, St Louis, Nashville, Atlanta, and Gainesville finishing in Sarasota Florida.

NOVEMBER: Florida for the entire month.

DECEMBER: Traveling along the I-10 from Florida through to Alabama, Mississippi, Louisiana, Texas, New Mexico, Arizona, and then to California. Once in California, the route will follow the I-5 north through Oregon and Washington and then Hwy 97 back to Canada.

Thirty of these seminars were presented in New Zealand and Canada. The transcript is available at the www.mitegone.com website under the print literature link entitled "Handbook on Formic Acid Use"

To request a seminar for your area, call Bill or Susanne at 1-250-762-8156 or email sruzikka@mitegone.com. References on the seminars are available!

NEWS FROM DOWN UNDER

Scotland's beekeepers have reported 31 cases of the *Varroa* destructor mite this year almost double the number of cases at the same time last year.

In the last five years, the mites have spread from England through southern Scotland and now are found as north as the Highlands.

There were 39 new cases last year and beekeepers fear that could each more than 60 this year.

"This is a worry but if beekeepers are vigilant and take the right precautions then it can be controlled, but not eradicated,"

Scottish Beekeepers Association president Una Robertson said.

The Scottish parliament now spends 60,000 pounds sterling a year providing advice but Scotland's 2,000 beekeepers want the appointment of special bee officers, saying without greater efforts to control the mite there may soon be no bee hives left.

The Northern Ireland government said it was concerned over a recent attempt to illegally ship bees from the United States to Northern Ireland.

A Department of Agriculture spokesman said a fine of up to 1,000 pounds (US\$1,380) faces those involved in smuggling bees.

"Imports from America and Australia are not permitted," the spokesman said. "Such attempts put the health of our bee stock at risk."

He said the potential threats from Africanized bee strains and the new threat of the small hive

beetle in imports from the U.S. and Australia underline the seriousness of illegal traffic in honeybees.

Imports of queen bees and attendant worker bees are permissible from other EU member states and from Hawaii and New Zealand's South Island only but an import licence must be obtained.

Imported bees have to undergo a health inspection on arrival in Northern Ireland.

Driving along freeways, those four-lane rapid transit avenues between here and there, is often stereotyped as simply doing windshield time. Sterile, bland and boring. One mile like the last, and the next. Maybe you're just not looking close enough.

Driving from Ohio to Maine in August this year was a 14-hour re-education for me, again. And a beekeeper's delight.

And this year was a bit different than other times I've made the same trip. It's been a wet year here. A double-edged sword for farmers, but for the weeds and wildflowers it's been a boomer.

Loosestrife was in full bloom, everywhere water even thought of collecting. Every depression was filled with purple spikes. Masses were marching on wetlands wherever they were. Five, 10, 50 acre purple seas of the stuff - more in the east than closer to Ohio, but all along the way, this spiked invader

stood out.

Guarding the edges were mounds and mounds and mounds of sumac. Like spiny sea urchins, the smooth green surfaces were pierced with spikes of reddish ripening seed pods, making even more for next year.

Fences were dripping with field bindweed, white flowers standing out and vines enveloping the scene. Like Kudzu, changing the shape and form of every fence, softening the lines with green.

Great long stretches of woodlines were composed of willow and locusts, and the tree of life. All tall and green and healthy this year.

Stands of goldenrod, with pale green tops stood tall and proud and ready to spring forth with their promise of gold to come. And, in the edges, where the gravelly fill was laid and no other plant could thrive, Chickory on the verge produced a lush, lavender landscape. No piece of land went unadorned.

In the middle, birdsfoot trefoil laid out a yellow, spotty carpet, between stands of still-blooming white sweet clover. These nearly-done (but later than usual) gangly

spikes still had the color and the size to capture attention where they appeared.

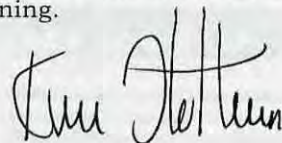
Further east, where the winery's grow, grape escapes covered the fence rows and trees, bushes and ground, heading for the road and more and more sun.

And everywhere, Queen Ann's lace stood tall, a sentinel to Fall-to-come.

Cattails and fragmites stands dominated some wet spots, especially near Ohio, not yet pushed out by loosestrife. But nearly everywhere there were a few purple pioneers, scouting the terrain, claiming living space.

And, more in the west than the east, a tall, gangly yellow something stood in sparse stands. Maybe goats beard, maybe not. Making an ID at 70 m.p.h. was a challenge.

Next time, on the freeway, don't see what you think is there, see what a bee sees. The trip is far more entertaining.



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Last year Granny politely asked me to put some bees on her property.

"Sure, we'll talk about it," I murmured, hoping she'd forget.

Granny wasn't offering space for a 30-hive beeyard, you understand. She wants one hive out behind the shed or on the vacant lot next door that she doesn't own - to pollinate her fruit and garden blossoms. She wants more raspberries and bigger apples.

Curiously, she claims to be allergic to bee stings. But she lives for that garden.

Granny resides in Carbondale, but I don't. And while I keep some bees near Aspen for a month or so in the Spring, after that I hardly ever get up that way. Honey bees require care and supervision. I'm not about to drive 45 miles every two weeks to tend a solitary beehive.

A couple of months ago Granny brought it up again. I wiggled. Then last week she called. She turned on the charm, like she does when she wants something.

I sensed an obligation. After all, I passed many a Summer evening fishing at her place. I never turned down a meal when I dropped in unannounced. Plus Granny and I do go back some.

Long ago she ran the Snow Chase Lodge, a ski bum flophouse at the base of Aspen Mountain. I stayed in the bunkhouse out back. Then she rented me kitchen and bathroom privileges when I moved into a nearby abandoned ski-lift shack.

When my shack's coal stove blew up in my face, and I thought I might go blind, she drove me to the hospital.

When I shot a four-point buck, she told me to hang it by the cellar door and taught me to butcher.

When my dog trotted over Trail Rider Pass and turned up in Marble, Granny picked her up.

She crows that she taught me to ski. Actually, we did ski a day together at Buttermilk once, and she did bark out "tips."

When she moved from Aspen to a house on Highway 82 outside of Carbondale, the deer carnage on the road bothered her. For a time, when she'd hear the screeching tires and telltale thud in the night, she'd go forth in her nightie with her Winchester .30-30. Stunned drivers and sometimes entire families watched in shell-shocked disbelief as she dispensed her mercy and then dragged Bambi down to the garage.

At some point she changed her name from "Mrs. Mac" - never her real name - to "Granny." Only complete strangers and her very closest friends call her "Pam."

Her diet centers around Coca-Cola, a particular kind of sherry, and of course meat. She harbors strong opinions about what constitutes a healthy diet. She holds strong opinions on just about everything.

Granny hops around in the garden, cussing and setting traps for "varmints." She straightens her ball cap and squints into the sun, then takes a hard hit off her Pall Mall. "There aren't any damned bees around here anymore. That apple tree used to hum with bees at blossom time," she says.

I knew I owed Granny, but I didn't want to pay up. I decided to pass the buck.

When I called Kay in Carbondale on a Sunday morning, she was reading in bed. She said she was down to three hives. I own 80, and I was about to run down to Collbran to check on some. I envied my beekeeper friend sleeping late on a Sunday morning. Maybe she knew something.

Kay said she'd never met Granny, but she found Granny's property location intriguing. Plus, she said, "I like old people." I spared her some details. She'll learn soon enough. There won't be any helping Granny out of bed or keeping her pills straight. Kay might get to help her dispatch a pesky skunk, though. Just please don't step on Granny's snakes. She really does love her snakes.

Kay thought if she were going to do this, she ought to move a hive over to Granny's soon - before they got too heavy with honey. I liked the sound of this.

OK, Kay didn't actually commit, but she did take Granny's number.

When I called Granny and told her all this, she chirped about more and better fruit and veggies and said she wouldn't wait for Kay to call. In fact she said she'd call Kay right away.

Like a prayer answered, later that day I got a swarm call from up around Carbondale. This gave me an excuse to bug Kay again. "Look," I said, "You could hive this swarm and drop it off at Granny's. Save you moving one of your heavy hives."

Kay hesitated, but she didn't say "no." She could have sounded more enthusiastic, but maybe she was still reading that good book in bed. "I haven't had a lot of luck with swarms, she said. "It seems like they die out or just leave the hive."

I tried to buoy her. I said my luck was the opposite. I said swarms provide a free way to increase your holdings. Mine always proved gentle and productive. Kay still sounded skeptical but said she'd phone the swarm caller.

This could work. Granny gets her bees. Kay gets to expand her operation by a third. I'm off the hook.

One way or another, Kay's going to take Granny some bees. I know she will. She has to.

Otherwise I have to.

Ed Colby

Granny & The Bees

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