



Bee Culture

DEC 2005

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2006 Calendar

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No mother and daughter reunion for these two queens, each going their own way. Do you see them? The elderqueen, marked in green is 'probably' in the process of being superseded by her younger, blonder daughter. When old queens are slowing down, but not yet done, a colony often raises its replacement. This softens the blow of sudden replacement and the gap in egg production that follows. And, it gives the colony a boost in double production for a while. Eventually the older queen succumbs to the frailties of age and expires at her leisure. Retirement plans for queens are quite modest.
photo by Bill Mondjack

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photo by Bill Mondjack

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Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

DECEMBER 2005 VOLUME 133 NUMBER 12

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Michael Young



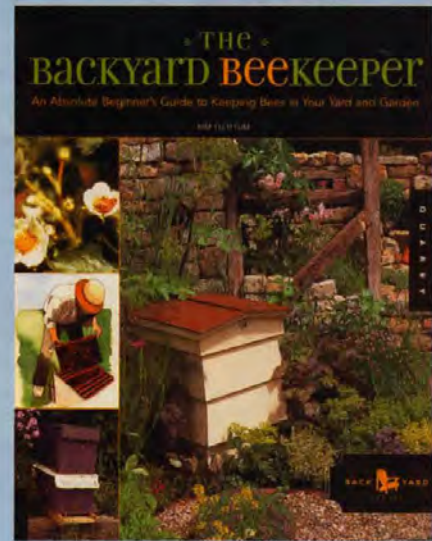
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Your 2005 listing by author and title, also books, videos and obituaries, is in this issue.

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New For Beginners & Gardeners



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Beeswax Secret?

My husband and I are beekeepers and, as a sideline, I own and operate a candle business using the beeswax that we harvest and render ourselves. I am trying to find an economic method of making white beeswax.

I know that you can whiten beeswax by using a solar wax melter, however, I currently use around 100-200 pounds of white wax a year so I am not sure if that much wax can be whitened with a solar wax melter. I have never been able to find any information about the amount of time it takes to whiten wax.

I have also been doing some research on whitening the wax using diatomaceous earth and a filtering press. This is the method I would prefer to use if it is economically feasible however I cannot find any specific information on how to do this or where to get the equipment and supplies needed. Some of the information I have run across talks about using the same type of filter press used for maple syrup but, again, nothing specific.

The whitening of beeswax seems to be a fairly well guarded secret however, I would appreciate any information and advise you or any of your readers could give me.

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We're All Foreign

It is interesting to read, in the *Mailbox* column, letters from people who have not renewed their subscriptions to the "other" magazine that prints articles about foreign beekeeping operations. Perhaps they do not realize that their beekeeping operations are also foreign, since the honey bees they tend are foreigners, imported in the formative years of the U.S., a country still guided by a constitution framed by foreigners.

The foreign interests to which hard working Americans have taken a back seat, mentioned in one letter, are in reality United



Comments
Suggestions
Criticisms
Kudos, and
anything else

States corporations, which are responsible for having legislation enacted minimizing restrictions on the movement of goods and services across international boundaries. U.S. corporations get a relatively free ride for products and services they purchase from and produce in other countries, with lower economic standards, at a fraction of the cost that would give an American a decent wage or provide an American business enough income to survive. This includes the "cheap honey" that this country imports.

I welcome information that helps me improve my efforts in caring for honey bees, regardless of the source. I'm especially indebted to a German beekeeper who, in addition to being able to speak fluent English, shared with me his method of *Varroa* control. This man has thus allowed me to produce wholesome honey from colonies that have never been exposed to the commercial chemicals that seem to be

increasingly ineffective.

We are fortunate to have *Bee Culture* and *American Bee Journal* so readily available to us in the U.S., and I'm pleased to subscribe to both publications.

Maybe we should label our honey, "Made in the USA by non-native honey bees."

Lee Edwards
Cherokee, CA

Honey Board Comment

I read your Inner Cover in the October *Bee Culture*. Nicely put. At the NHB booth at Apimondia we received many comments and took a pretty good bashing about chemicals used by U.S. beekeepers and lack of standards and quality assurance programs in the U.S. We did our best to stand up to the criticism, and several folks from the U.S. often were in our booth to help answer questions.

Bruce Boynton
CAE
National Honey Board
Longmont, CO

Editor 623 W. Liberty St.,
Medina, OH 44256
KIM@BEECULTURE.COM

Vented Bee Hive Cover

Inventor: Norman R. DeYoung

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INNER COVER

This has been an intensely interesting year for the beekeeping community. And though I seldom dwell on the past, I often refer to events gone by that put the present in a broader, and perhaps more understandable perspective. Sometimes, just reviewing what has occurred helps us see things a bit more clearly, since we have the cushion of time to soften the harshness of the reality of the moment.

Too, looking back can help prepare us for what probably lies ahead, since we are all subject to the seasons, and they march on in spite of what we want. Let's review a bit to see what may be, because of what was, shall we?

Aussie bees arrived with both style and substance this year and got a toehold in the almond pollination business. Early reports indicate they did what they were asked to do in the orchards, and continued to thrive for the rest of the season. Overwintering success, surviving the mites, the moving and the other stresses required are not yet decided, but time will tell. The news is that they are here at all. The U. S. has not had enough bees, or beekeepers to fill the needed bottles and barrels in this country for years. Now, we are importing pollination, too. An interesting turn, for certain, but what does it mean? Well, there will be more, and maybe even more bees than we suspect. I alluded to this earlier this year...why struggle with the beekeeper stress and costs of keeping bees alive, when they can be simply picked up at the airport, like any other import? Honey packers figured that out years ago...It's a wonder it took the rest of us this long to figure this out.

This interfaces nicely with the change, and the anticipated even greater change in the need for colonies for almond pollination. Fewer colonies and more almonds, and the supply and demand curve kicks right in. With more almonds coming online, and the price of almonds staying high, the probability of an Aussie bee pipeline is certain. Unless, that is, some other country wants a piece of that action. A bidding war, and then a price war could be on the horizon. That would be interesting to watch but it's U. S. beekeepers that are caught in the middle. I'd watch out for this if I put boxes on trucks for a living.

Honey purity finally got due notice this year, and the U. S. got slammed for seemingly not giving a whit about it one way or the other. Some here do, certainly, and have for as long as they've been in business. Others, well, maybe not. What was once the most feared thing that could happen...that is that our pure, natural product could be found less so...now happens almost as often as someone looks for problems. Antibiotics, legal and otherwise; and pesticides, legal and otherwise are often found...too often found, in amounts to great to be ignored anymore. Samples and names are being taken...watch closely what you put in you hives. Someone wants to know.

Speaking of which, tylosin finally got a label for American foulbrood. Tricky stuff, that tylosin. If we ever actually get the label, read it carefully. Then read it again. Then maybe try something else...like a match. Yes, I know, burning is expensive. But so is a barrel of honey you can't use. And a truckload will really cost you.

And African honey bees. Coming to a bee hive near you. Soon. Are you ready? This isn't new, but what should be new is your relationship with the local media. That's a good relationship to have anyway, but if it has waned over the years, now's the time to renew old friendships and make new ones. You want to work well with the press. That's a given.

Encouraging are the advances in varroa control and management that have been made this year. Colonies that are collapsing in

California right now may dispute that, but it's true. Of course the advances that have been made aren't the advances some beekeepers want to hear about. I've said before, and now there's good data to support the fact that old comb kills bees (old comb with pesticides soaked in that is, not just old comb by itself) and getting rid of the stuff helps the health, well being and stress levels in the colony. That's one.

Formic acid, legal formic acid that is, is another. It works, and it's relatively cheap, and it's pretty safe. And it doesn't have a residue problem (see above, honey purity). That seems to be four for four. That's enough for me, for now anyway.

And my favorite. The bees that take care of the bees that go into winter need to be healthy, or the bees that go into winter won't be. And they die. And your colony collapses in January or February. Sound familiar? No mites in July means bees next March. It's a fairly straight forward relationship, actually. You have to choose though. Or control the problem earlier. You have to manage them. I need say no more here.

Please use the calendar in the center this month for the whole of next year. Our sponsors were generous in providing you with this gift and we all hope it serves you well. Let us know your thoughts on how it could be better, and thank the sponsors for their support. And lots of thanks to all who contributed...our sponsors, the photographers and writers, and to Kathy and Dawn who worked to make it work as well as it does.

Finally, all of us here at *Bee Culture* - Dawn, Sharon, Kathy and Kim, wish you and yours a safe, sane and wonderful holiday season.

Dawn
Sharon
Kathy
Kim

Looking Back
Looking Ahead

DECEMBER - REGIONAL HONEY PRICE REPORT

A year makes a little bit of difference overall, but for some products in some regions, it's a real big change. Posted here are the December 2004, and the December 2005 prices for all products in all regions. Take a look at yours.



Reporting Regions - 2004													History			
1	2	3	4	5	6	7	8	9	10	11	12	Summary		Last	Last	
Extracted honey sold bulk to Packers or Processors													Range	Avg.	Month	Yr.
Wholesale Bulk																
55 gal. Light	1.12	1.00	1.25	1.25	0.99	1.13	1.24	1.40	1.12	1.10	1.36	1.31	0.99-1.40	1.19	1.11	1.40
55 gal. Amber	1.05	0.80	1.04	1.00	0.83	0.99	1.21	1.04	0.88	0.85	1.25	1.20	0.80-1.25	1.01	1.04	1.27
60# Light (retail)	123.33	111.93	89.50	91.25	110.00	120.00	112.57	100.80	120.00	123.77	149.00	113.75	89.50-149.00	113.83	105.52	98.12
60# Amber (retail)	106.25	105.53	113.70	88.00	85.00	102.50	111.40	102.50	110.00	113.70	139.00	100.00	85.00-139.00	100.09	108.34	92.61
Wholesale Case Lots																
1/2# 24's	44.77	46.15	47.02	35.17	47.02	36.00	37.93	47.02	47.02	39.00	36.00	47.02	35.17-47.02	42.51	40.12	37.18
1# 24's	63.28	59.03	57.60	50.77	51.20	56.00	59.72	60.80	51.85	77.76	79.75	68.40	50.77-79.75	61.35	61.38	58.50
2# 12's	51.52	59.58	55.20	47.19	44.40	48.00	52.38	65.30	46.50	57.84	39.00	60.90	39.00-65.30	52.32	52.38	50.85
12 oz. Plas. 24's	46.19	55.03	54.00	48.71	39.00	48.00	46.56	48.00	51.60	47.28	68.70	52.80	39.00-68.70	50.49	51.58	45.56
5# 6's	50.47	62.98	57.08	50.81	57.08	60.00	58.67	55.00	57.08	61.86	75.00	72.00	50.47-75.00	59.84	64.38	56.53
Quarts 12's	60.00	100.35	82.20	71.24	65.00	83.33	83.15	77.20	81.00	95.00	86.70	84.00	60.00-100.35	80.76	82.49	76.15
Pints 12's	40.00	49.95	54.60	45.05	37.00	50.33	53.05	45.57	48.00	55.00	45.00	51.00	37.00-55.00	47.88	48.57	44.72
Retail Honey Prices																
1/2#	2.36	2.52	2.61	2.60	2.29	3.45	2.28	2.45	1.95	2.35	2.91	2.50	1.95-3.45	2.52	2.43	2.46
12 oz. Plastic	3.04	3.02	2.85	2.97	3.57	3.50	2.90	3.42	2.99	2.95	3.45	3.30	2.85-3.57	3.16	3.09	3.07
1 lb. Glass	3.68	3.29	3.60	3.68	3.25	4.00	3.67	4.13	4.00	4.10	4.06	4.05	3.25-4.13	3.79	3.84	3.57
2 lb. Glass	6.75	6.01	6.37	5.50	6.82	6.99	6.00	7.00	5.32	6.41	6.35	7.25	5.32-7.25	6.40	6.48	5.97
Pint	5.25	6.25	5.59	4.73	5.95	5.75	6.03	5.68	5.08	5.75	4.75	6.00	4.73-6.25	5.57	5.68	5.59
Quart	8.92	8.55	9.50	7.90	7.95	8.83	8.56	8.71	8.60	10.75	8.31	10.03	7.90-10.75	8.88	8.68	8.53
5 lb. Glass	12.71	12.70	13.50	12.27	13.14	12.00	12.33	14.50	13.14	13.32	13.56	14.99	12.00-14.99	13.18	12.85	12.20
1# Cream	4.50	5.50	4.90	4.15	4.90	4.25	4.22	4.82	4.90	5.34	5.28	4.25	4.15-5.50	4.75	4.52	4.23
1# Comb	4.83	4.41	4.25	4.50	6.47	4.50	5.54	4.66	3.99	5.00	6.25	5.50	3.99-6.47	4.99	5.00	4.85
Ross Round	5.00	3.90	3.75	4.52	5.08	4.00	4.50	4.99	5.08	5.20	5.88	4.50	3.75-5.88	4.70	5.06	4.71
Wax (Light)	2.50	2.58	2.15	1.90	1.25	1.98	2.30	1.50	2.50	2.19	2.17	2.53	1.25-2.58	1.67	1.83	1.43
Wax (Dark)	1.85	1.60	1.93	1.73	1.10	1.93	1.85	1.08	1.95	1.68	1.85	2.00	1.08-2.00	1.35	1.53	1.10
Poll. Fee/Col.	46.25	37.33	36.00	36.67	35.00	42.50	42.29	40.00	30.00	42.31	45.00	50.50	30.00-50.50	40.32	40.43	40.66

Reporting Regions - 2005													History			
1	2	3	4	5	6	7	8	9	10	11	12	Summary		Last	Last	
Extracted honey sold bulk to Packers or Processors													Range	Avg.	Month	Yr.
Wholesale Bulk																
55 gal. Light	0.90	0.95	0.90	1.05	0.62	0.73	0.93	0.90	0.90	0.82	0.96	1.03	0.62-1.05	0.89	.92	1.19
55 gal. Amber	0.88	0.85	1.00	0.90	0.59	0.70	0.73	0.88	0.65	0.65	0.95	0.95	0.59-1.00	0.81	.86	1.01
60# Light (retail)	102.00	111.20	103.87	99.70	82.00	115.00	81.50	103.33	103.87	103.87	140.00	100.00	81.50-140.00	103.86	113.85	113.83
60# Amber (retail)	108.00	105.90	101.82	98.20	82.00	100.00	80.00	102.50	100.00	101.82	135.00	85.00	80.00-135.00	100.02	96.19	100.09
Wholesale Case Lots																
1/2# 24's	40.99	50.38	49.88	38.70	49.88	32.50	36.79	49.88	49.88	35.76	34.50	59.50	32.50-59.50	44.05	50.10	42.51
1# 24's	59.74	57.50	64.90	56.94	61.68	56.00	62.44	62.40	51.25	75.00	74.90	66.40	51.25-75.00	62.43	60.71	61.35
2# 12's	61.34	56.79	57.18	52.47	58.20	48.00	60.14	65.00	45.20	57.84	46.20	58.96	45.20-65.00	55.61	57.30	52.32
12 oz. Plas. 24's	58.48	52.46	54.19	49.48	46.95	48.00	49.91	51.60	40.44	47.64	64.75	59.44	40.44-64.75	51.94	52.60	50.49
5# 6's	55.06	67.86	67.27	57.27	67.27	61.00	63.46	52.70	55.80	56.43	58.00	71.00	52.70-71.00	61.09	60.59	59.84
Quarts 12's	72.00	100.35	81.91	75.75	76.00	76.00	88.74	76.00	96.00	100.00	84.20	67.38	67.38-100.35	82.86	83.27	80.76
Pints 12's	35.00	49.95	59.65	53.00	36.00	45.13	80.00	44.00	60.00	49.50	55.00	53.88	35.00-80.00	51.76	49.20	47.88
Retail Honey Prices																
1/2#	2.44	2.41	2.58	2.61	2.58	2.58	2.53	1.65	2.39	2.44	3.00	2.95	1.65-3.00	2.51	2.59	2.52
12 oz. Plastic	3.35	3.15	3.50	3.01	3.40	3.09	3.02	3.52	3.17	3.01	3.35	3.53	3.01-3.53	3.26	3.20	3.16
1 lb. Glass	3.81	3.53	5.09	3.95	3.65	3.50	3.58	4.42	4.04	3.49	3.96	4.20	3.49-5.09	3.94	3.85	3.79
2 lb. Glass	7.40	6.46	8.25	5.94	6.49	5.60	6.11	8.12	6.24	6.68	5.55	6.64	5.55-8.25	6.62	6.68	6.40
Pint	4.99	6.88	6.80	5.70	5.25	5.17	8.27	5.56	5.33	6.50	5.02	7.50	4.99-8.27	6.08	5.77	5.57
Quart	7.88	8.55	11.52	8.13	7.95	8.25	8.00	9.09	9.00	12.75	8.63	8.99	7.88-12.75	9.06	9.16	8.88
5 lb. Glass	14.18	13.51	19.00	13.10	15.00	13.00	18.11	15.99	13.80	13.15	13.47	12.99	12.99-19.00	14.61	13.20	13.18
1# Cream	5.09	5.16	5.29	4.51	5.17	4.00	5.07	5.15	5.17	5.05	4.89	4.10	4.00-5.29	4.89	4.69	4.75
1# Comb	5.33	4.54	6.95	5.43	6.95	4.50	6.79	4.75	6.95	5.00	6.00	5.80	4.50-6.95	5.75	5.61	4.99
Ross Round	5.50	3.97	5.74	4.65	5.74	4.10	6.88	5.00	5.74	5.63	5.83	4.99	3.97-6.88	5.31	4.85	4.70
Wax (Light)	2.25	2.17	2.14	1.83	1.40	2.13	2.35	2.38	2.20	3.14	1.90	2.38	1.40-3.14	2.19	1.99	1.67
Wax (Dark)	1.60	1.73	1.40	1.50	1.15	2.00	1.48	2.00	1.45	2.33	1.50	2.00	1.15-2.33	1.68	1.73	1.35
Poll. Fee/Col.	49.00	56.33	32.00	36.50	40.00	44.00	44.50	60.00	40.00	70.94	75.00	82.50	32.00-82.50	52.56	55.86	40.32

WHAT'S AHEAD FOR 2006!



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Beekeeping and conserving biodiversity of honeybees
Sustainable bee breeding
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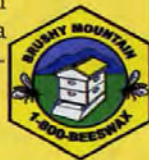


Northern Bee Books

Beekeeping and conserving biodiversity of honeybees Sustainable bee breeding and theoretical and practical guide. 180 pages. ISBN: 1-904846-14-9. This is a new title reporting the work of six bee labs in Europe who have participated in the BABE (Beekeeping and Apis Biodiversity in Europe) project. The lead lab is that of Dr. Robin Moritz in Germany and there are contributions from Jean-Marie Cornuet, France; Cecilia Costa, Italy; Pilar De la Rua, Spain; Stefan Fuchs, Germany; Annette Bruun Jenson, Denmark; Marco Michel Solignac, France. As such it is a very important contribution to the literature in this area. £11.00 UKPP. Available from Northern Bee Books online www.beedata.com/nbb/babe.htm

“Hood Small Hive Beetle Trap”

Developed by Mike Hood at Clemson University, this new hive beetle trap kills beetles simply and easily. The trap fastens to the bottom bar of any size frame. Beetles enter the trap in an attempt to seek safe shelter and drown in the FGMO or apple cider vinegar you add. This offers a convenient and tidy means of killing beetles without chemicals and without major alteration of the hive set-up.



“Acrylic ‘Life of the Honey bee’ Paperweight”

This is an interesting conversation piece on your desk or a handy teaching tool to explain the life of honey bees. Measures 6-5/8" long x 3" wide x 7/8" thick. This acrylic block showcases an actual egg, larva, pupa, worker bee, drone, queen, piece of foundation, piece of comb, queen cell, pollen, honey, and beeswax.



“Ulster Observation Hive”

By combining an observation hive with a five frame nuc this hive makes for a longer-lasting and less problematic demonstration unit. Instead of removing the queen from the hive completely, she is simply placed above a built-in excluder in the observation section. A full ventilated screened bottom makes temperature regulation much easier on the bees. A division board feeder is included to keep the bees happy and busy while they're shut up. The plexiglass windows and their removable covers are included.

Liquid Sugar from Dakota Gunness

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The winner of this year's “Best New Technical Invention” competition at Apimondia 2005 in Dublin, Ireland.

The extractor is made of stainless steel and weighs about 20 kg. (44 pounds). It is 90 cm (appr. 3 feet) in diameter and 20 cm (about 8") tall and hold three or four frames depending on the size. It is operated manually with a crank ratio of 1:3. It extracts radially, which means that both sides of the comb will be extracted simultaneously, significantly lowering the time and workload consumption during the extraction process. For further information contact Dennis Svane Christensen, Swienty A/S, Tel: +45 7448 6969 or dsc@swienty.com



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New Items From Walter T. Kelley —



The **Cloake Board** method of queen rearing takes advantage of both a queen-less and queen-rite system. Consists of an outer wooden frame with permanently attached queen excluder and a grooved inner edge which allows a 'slide' to be easily slipped in and out. This board creates a 'division' between hive bodies and provides a second upper entrance. A queenless state is created when the 'slide' is inserted. Removal of the 'slide' returns the colony to a queen-rite state.

The Honey Bee Inside Out by Celia F. Davis. Presents detailed information on the structure and function of the honey bee and explains complex issues in simple English. Each of the eight chapters covers an aspect of bee biology with excellent illustrations and diagrams, giving a realistic impression of the parts involved. This book is up-to-date and valuable to anyone wanting to better understand the little insects that work so hard for us.



Kool-Down — Aloe Vera Mist contains 3.9% Lidocaine. Offers immediate relief for bee stings and smoker burns! Originally developed for soothing relief of sunburn, Kool-Down also relieves pain from wind burns, insect bites, itching, jellyfish stings, household burns, minor scrapes. Available in 2 oz. spray bottle.



Mating Box — Standard hive body size, features four separate compartments, each has its own entrance, air vents and plywood lid. Dividers may be removed for compartment expansion . . . fully assembled. (No outer cover included.)

Nuc/Swarm Box Kit — Includes a four-frame, fully assembled nuc box. Includes wood telescoping cover and bottom board with *Varroa* screen and debris board, along with two Brood Frames, one Cell Bar Frame and one Division Feeder.



For information on these products contact The Walter T. Kelley Company, 800.233.2899 • www.kelleybees.com

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The **HAPPYKEEPER** bottom board consists of a wooden frame with a removable center made of polyethylene tubes held together by three struts. It has kept an apiary in the Parisian region healthy without any treatment against *Varroa* mites since April 1997. Users also benefit from its other advantages — optimal elimination of hive waste due to its 3.5 mm wide openings; bottom board does not require cleaning at the end of winter and moderate openings uniformly spaced are easily managed by the bees to provide the colony with the best atmosphere which makes it healthier and stronger in spring. Available from HappyKeeper USA, 503.226.6000 or toll free 866.371.6006 — \$21.50 + shipping. Also visit www.apiculture.com/happykeeper/



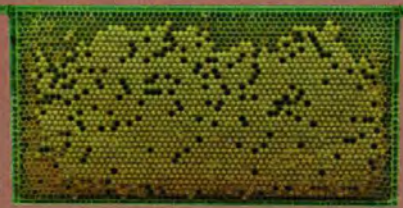
You read all about him here this Fall, now read his book! *Confessions Of The Killer Bee Guy*. Reed Booth. 8½" x 11". Spiral bound, soft cover, all color. 55 pages. This is actually an excellent book. The information about bees, beekeeping, honey, pollen and propolis is straight forward and pretty accurate. There's a photo on every page showing AHB nesting sites and activities, and a fact box that gives good information, too. If you need to show, or tell someone about AHB, there's no single source that compares. Yes, sometimes the story gets a bit overblown, but not by much. Killer bees do kill sometimes. X152 \$20.

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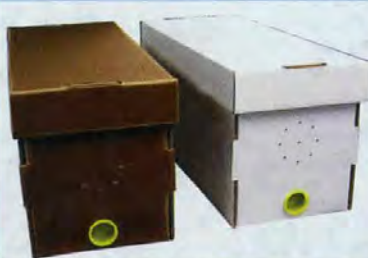


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This is a great way to reduce the number of *Varroa* Mites during the brood rearing season, even if honey is being produced. It works because of the mite's life cycle and the preference for drone brood. The female mite enters the cell two to three days before it is capped. She will wait for 60 hours after the cell is capped, then begin laying eggs at a pace of one per 24-30 hours. Since a drone is capped about three days longer than a worker, more mites will emerge with a drone. On average 1.8 mature mites will emerge with a worker bee, but 2.8 with a drone. Studies have shown that, by removing your drone brood, the number of mites in your hive will be greatly reduced.

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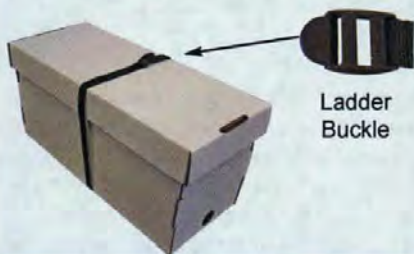


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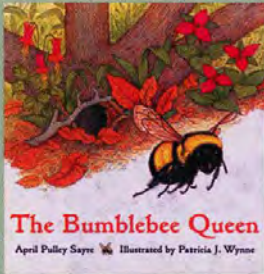
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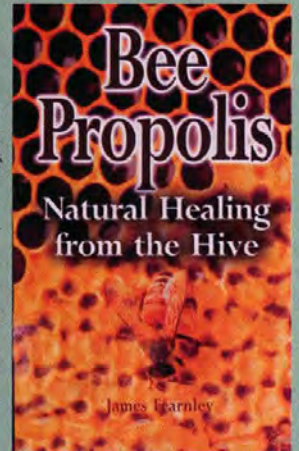
Hive Minder

Keeping hive records is often neglected by beekeepers. We either forget to write it down, or we are too sticky with honey that anything we write can't be read later. With the Hive Minder everything from medications to requeening to the strength of the colony can be tracked. It staples to your hive and then use push pins to mark the information. You can develop a more advanced system by using different colored pins.



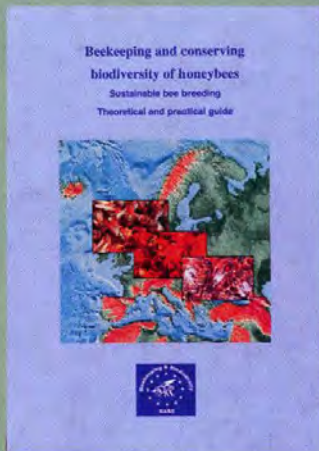
The Bumblebee Queen. April Sayre. 8½" x 8½". Hard-cover, all color, 33 pages. 2005. This delightful, excellently illustrated book for younger children follows the yearly cycle of a bumblebee queen – overwintering, building a nest, producing the colony and back to Winter. Each page has easy to read descriptions of the drawings, plus educational additions that further explain the story. Helpful hints and projects, plus resources and bumblebee web pages. X143 \$16.50.

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Bee Propolis. Natural Healing from the Hive. James Fearnley. 5½" x 8½". 175 pages. B&W. Soft cover. If you use propolis, or think you'd like to try using it because of what you've heard about it's healthful healing properties, this is the book you've been waiting for. Chapters include – What Is Propolis? Folk History. Propolis in Modern Times. How Does It Work? Using Propolis To Treat Disease. Propolis Products. Making Your Own Medicine. Plus, there are pages of references, specifications and testing procedures, and contacts. Fearnley has gathered the latest information, the history, and all the uses of this no-longer-mysterious hive product for you to try. X153 \$15.

Finally!



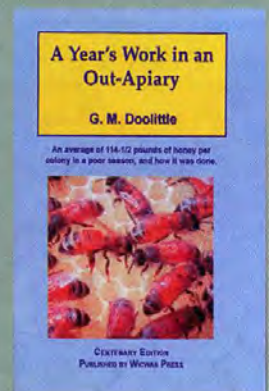
Beekeeping And Conserving Biodiversity of Honey bees. Lodesani and Costa, Editors. 179 pages. B&W. Soft cover. If you're serious about two things – better queen breeding and better bees – this book is important. It covers both theoretical and practical information for sustainable bee breeding – Note, *Breeding*, not production. But it has, at its core, a deep conviction for the conservation of each honey bee race, and the positive attributes of each race. Genetics, heritability, selection, biodiversity of local populations, breeding, evolution, distribution and conservation. All together, explored. X150. \$20.

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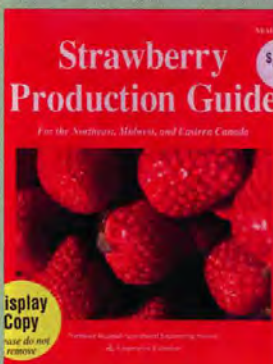
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A Year's Work In An Out-Apiary. G.M. Doolittle. Reprint of his 1905 landmark book. Published by Larry Connor, with study questions added. 114 pages. B&W. From April 14th to October 10th, G.M. Doolittle shares all the how-to, the secrets, the fun and not so fun things you need to know to make lots of honey. In 1905. This is an absolutely delightful read, with ample line art, and an article by E.R. Root printed in the 1897 *Gleanings* about the author. X144. \$24.

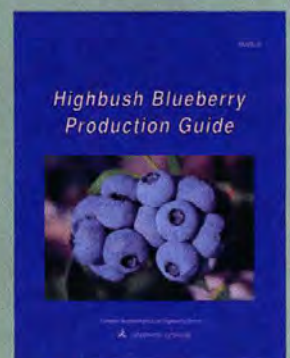


If you are a serious pollinator, you need to know as much, or more about the crops your bees visit that the crop grower. You need to be able to talk bloom dates, pests and diseases, fertility, irrigation, varieties, pollination requirements, floral biology, potential yields . . . and if you know the jargon and the secretes, you'll be a better pollination supplier, and can do a better job. We've been providing the NRAES Pumpkin Guide from Cornell for that reason, and the pollinators who have used it sing its praises, and have increased contracts, and better, income.

These two new books are excellent in all respects, and both specifically address the need for, and techniques for honey bee pollination. Each comes in a large, three-ring binder, full color throughout, with everything you, and your grower need to know. You may even want to include a copy to give to your grower. Each is the price of a colony rental, and is an investment in your future business.



- **Highbush Blueberry Production Guide.** 200 pages, Full color. X149 \$50.
- **Strawberry Production Guide.** 162 pages. Full color. X151 \$48.50.



The comments by Editor Kim Flottum in the October, 2005 *Bee Culture* with reference to testing honey are timely. Perhaps it's indeed the hour to "talk about something nobody wants to talk about." I have received unconfirmed reports that antibiotic is being found in U.S. honey like other places in the world confronted with Terramycin®-resistant American foulbrood. Fortunately, examples of this appear to be few at the present time.

The antibiotic involved is tylosin lactate, sometimes simply called tylosin. It has different properties than the product Terramycin®, often referred to as TM, which is formulated using oxytetracycline (Oxy-Tet). As I understand it there is zero tolerance for tylosin in honey, meaning any amount found, no matter how small, will likely result in marketing and regulatory consequences. Although veterinarians might prescribe tylosin as an "extra label drug use", this is void if a "violative food residue, or any residue which may present a risk to public health" is found.

I am shocked but not surprised at this turn of events. It was retiring Dr. Bill Wilson in this magazine who stated, "The U.S. Beekeeping industry could be faced with a widespread epidemic of American foulbrood disease (AFB) that would be just as destructive as uncontrolled infestation of *Varroa* mites. This scenario could take place if beekeepers fail to control Terramycin-resistant AFB and scientists fail to develop an effective substitute..."¹

Is history repeating itself? I reported in my *Apis* newsletter over a decade ago that: "While at the Fifth Ibero Latin American Congress on Apiculture held May 30 through June 2, 1996 in Mercedes, Uruguay, I learned what can happen when AFB gets out of hand. Since it was first discovered in Argentina in 1989, the beekeepers in that country have gone through three stages in controlling AFB, according to Marcelo del Hoyo of the veterinary faculty, University of Buenos Aires. The first was denial, when the name American foulbrood was not uttered. When the disease was finally recognized in affected areas, beekeepers tried to combat the problem locally, but it was still ignored else-

Malcolm T Sanford

Antibiotic (Tylosin) In Honey



"Breaking news as I complete this column is that a label for Tylan® (tylosin tartrate) has been approved by the U.S. Food and Drug Administration. The details were not available at press, but were to be made accessible by early November."

where in the country. The present stage is a mature condition where most good apiculturists have been exposed to the disease and have at least temporarily treated the problem.

"The fact that Argentinean beekeepers went through the above phases, however, appears to have led to something more serious than in other parts of the world. It is the only country to my knowledge where *Paenibacillus larvae* has become resistant to oxytetracycline. This was confirmed in a study reported at the Mercedes congress by A. Alippi and M. Aguilar (National University of Mar de la Plata). They used biochemical techniques (PCR) to analyze bacterial DNA. Resistance was found in only 28 percent of samples, but this translated to 58 percent of tested locations in the country.

"Argentine researchers reported on another product, tylosin lactate (evidence of its effectiveness was first published by John Hitchcock and colleagues at the Laramie Bee Laboratory in the *Journal of Economic Entomology*. 63:1, pp. 204-207, February, 1970), which they say will control the disease as an alternative to Erythromycin and oxytetracycline."²

Dr Nick Calderone at Cornell University writes the following that concurs with Dr Wilson's assessment: "With the emergence of TM resistant AFB, beekeepers have no way to protect themselves from AFB. The USDA-ARS Bee Research Labo-

ratory in Beltsville, MD has done a great deal of work evaluating a number of other antibiotics for use in AFB management. The most promising is an antibiotic called TYLAN (a formulation of tylosin). It is very effective; however, the FDA is probably going to approve it for use as a preventative for use on healthy colonies. The results could be disastrous. Why? TYLAN, like TM, is only effective against the vegetative stage of AFB. The spores survive to germinate at a later date. If you suppress the disease, then transfer combs among colonies, all of your colonies will eventually have AFB. Then, you will need to keep all of your colonies medicated."³

He further quotes Dr. Mark Feldlaufer, Research Leader at the USDA Beltsville Bee Laboratory: "While a large amount of work has been completed, we are not done. FDA must review all material submitted, and everything dealing with antibiotic use in agriculture is being scrutinized. The January 6, 2001 issue of the N.Y. Times pointed to the (over) use of antibiotics in farm animals merely for the prevention of disease. A Jan. 19th editorial in the prestigious journal SCIENCE stated that 'Using the same antibiotics in people and animals is a bad idea.' and a Feb. 19th article in Chemical & Engineering News was titled 'Furor over animal antibiotic use' Faced with this intense scrutiny, FDA has indicated the short-

est route to approval is as a 'dust' and for the 'control' of AFB. Syrup with antibiotic poses a greater residue risk, while 'preventative' treatments for AFB amount to using an antibiotic in the absence of disease, a policy being reviewed by FDA. Even with 'dusting' for the 'control' of AFB, I'm guessing approval for lincosmycin and/or tylosin is at least a year away.

"So, what can a beekeeper do when faced with Terramycin-resistant AFB in the interim? There is something known as 'AMDUCA'. This stands for the 'Animal Medicinal Drug Use Clarification Act of 1994', and it allows for the extra label drug use (ELDU) of certain approved antibiotics. 'Extra label use' means using an antibiotic approved for let's say chickens and swine, for honey bees. The key is that the antibiotic needs to be prescribed by a veterinarian!"⁴

Alberta's provincial apiculturist Dr Medhat Nasr writes that the Canadians have also used this approach: "Recent finding of levels of prohibited antibiotics in honey imported from China and Argentina has resulted in recalling honey from the market around the world. The public has become aware of this issue. It also has increased the surveillance program for residues analysis in honey around the world. In addition, the chances of finding residues of antibiotics in honey has increased due to: 1) improved technology for residues analysis in honey, 2) extracting honey combs from the brood boxes, 3) increased residues in bee colonies from the repeated administration of antibiotics in bee colonies, and 4) extra-label use of antibiotics such as Tylosin that does not have Maximum Residues Limit (MRL) required more inspection to ensure no residues in any produced honey.

"For interim solution, Alberta beekeepers could use the veterinarian-Extra-label use privilege for getting Tylosin. For long-term solution, Alberta Agriculture, Food and Rural Development (AAFRD) is conducting aggressive educational programs for advocating and promoting integrated pest management practices for AFB control. Alberta Beekeepers

Association in a partnership with AAFRD is also supporting a research program at Agriculture and Agri-Food Canada, Beaverlodge, Alberta. The objectives of the research program are: 1) to develop information for registration of alternative antibiotics for treatment of oxy-tet resistant AFB, 2) develop methods for prediction of AFB infection in bee colonies, and 3) to improve resistance of honey bees to AFB. The Agriculture and Agri-Food Canada, Canadian Honey Council and the ABA also are working towards getting Tylosin registered for use in bee colonies.

"Alberta is a honey-exporting province. Finding any residues in honey could affect the market access. Therefore, AAFRD has taken the lead in working with the Alberta Beekeepers Association (ABA) and has initiated the honey surveillance program. This program is a surveillance and extension project, not a regulatory program. The objectives of the project include determining management practices that result in detectable antibiotic residues in honey, developing best management practices to eliminate residues, and following up with individual beekeepers who have detectable residues in their honey. Thus, Alberta Agriculture will be able to help Alberta beekeepers in ensuring production of high quality honey that meets the consumers' expectations. It also will address the market access issues and promote the safety of Alberta honey."⁵

As Editor Flottum points out, most U.S. producers are not exporters and so not faced with as stringent controls as those in exporting countries like Canada. This means he concludes: "No one knows what's happening in the U.S. Or no one is saying."

Word of mouth and various writings appear to have communicated the message that tylosin works as West Virginia WVDA State Apiarist George Clutter is reported to have said, "even better than the Terramycin did."⁶ A significant problem seems to be that many are using the material like they did Terramycin as a preventative (prophylactic), may also be mixing it in similar proportions (tylosin is much

more concentrated) and/or feeding it in syrup, which further increases the risk of honey contamination.

Here's what Harry Fulton, Mississippi's State Apiarist writes, "Terramycin has been used by beekeepers since the early 1950s for the control of AFB, and the development of terramycin-resistant AFB has long been a serious concern. Without an effective antibiotic to combat AFB, the only way to deal with AFB is to destroy by burning hives and bees with the disease. Work carried out by the USDA Bee research labs in conjunction with beekeepers and state apiary personnel around the country has shown that the antibiotic, tylosin, is effective at controlling AFB and has substantial safety for both bees and human. Elanco, the producer of tylosin, will be submitting the paperwork for registration of Tylan for use in honey beehives. Mann Lake Ltd. will be selling the product in bulk and in tea bag-like individual packets. Mann Lake will not be the sole source of the product. The antibiotic will be registered only for therapeutic use (after you see the disease signs) and for use only in "dust" formulations. Jan Kochansky of the USDA Beltsville Bee Lab recently reported (*Journal of Apicultural Research*, vol. 43, pg. 65, 2004) on his studies of tylosin residues in sugar syrups and honey. It can take one to three years for tylosin and its first breakdown product (also effective in controlling AFB) to breakdown further in honey. Tylosin was shown to have a half-life of about 75 days in sugar syrup. Thus, if you feed it to your bees in syrup you will very likely exceed the tolerance level in your honey crop. Without question, tylosin presence and levels will be monitored by regulatory personnel."

Editor Flottum points out that questions remain concerning how much contamination is too much and that testing for residues in honey is not an exact science. These are academic, however, because again there is no residue limit for tylosin in honey in the U.S. That means "zero tolerance," and in the brave new world of continually improving testing technology this can only mean that if one uses tylosin, it will be detected. Terramycin® was much more forgiving because it did

break down readily in liquid (so much so that it was more effective as a dust) and honey.

Breaking news as I complete this column is that a label for TYLAN® (tylosin tartrate) has been approved by the U.S. Food and Drug Administration.⁸ The details were not available at press, but were to be made accessible by early November. Several questions immediately come to mind. Is there a tolerance level in honey associated with the label? What differences exist between the two tylosin compounds (lactate vs. tartrate), and will the product be only deployed as a dust? Finally, will it be labeled only for treatment and not prophylaxis as noted above?

Whether labeled or not, however, one conclusion is clear given the material has already been detected in some samples of honey. Using tylosin for AFB control, especially as a prophylactic and in liquid form, could be a "smoking gun" in the making when it comes to contamination. The label will be the law, and due diligence demanded of all honey producers when using this material. **BC**

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Check www.elanco.com for Tylosin label updates.

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

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On August 29, 2005, Hurricane Katrina made landfall, and devastated our nation's Gulf Coast region. Congress immediately allocated billions of dollars to the affected States for debris cleanup and removal, restoration of public utilities, and repair of highways, bridges, and other critical infrastructure. But who will pay to repair damaged homes and businesses of area residents? If Katrina taught us anything at all, it is that governmental bureaucracy may slow the response of federal, state, and local authorities to a natural disaster, which places the onus on individual residents to assume primary responsibility for the safety and security of their families, homes and businesses. This means that it is *your* responsibility, as a beekeeper (particularly, if running a full or part-time business), to ensure that your beekeeping operation is adequately prepared for a disaster. Can your beekeeping operation survive a hurricane, flood, fire, earthquake, or other catastrophic event caused by nature? This article helps you develop a disaster plan that protects your business, and makes it easier for you to answer, yes.

How to develop a disaster plan

All beekeeping operations – hobby, sideline, and commercial – involve the seasonal management of honey bee colonies. But what distinguishes sideliners and commercial beekeepers from hobbyists? Well, sideliners and commercial beekeepers keep bees for profit. To make a profit, a beekeeper will pursue either or both of the following income-generating activities: (1) rental of honey bee colonies to growers for pollination; and (2) sale of honey bee by-products, like honey, beeswax, propolis, bee pollen, and royal jelly; and also, sale of secondary items made from those by-products (e.g., candles, soaps, and creams made from beeswax, and nutritional supplements made from propolis, pollen, or royal jelly).

A commercial beekeeping operation is carried out in at least two locations: (1) *outside*, in an apiary or bee yard where the bee hives are kept; and (2) *inside*, in a building, such as a honey house or garage, where honey and beeswax are extracted and processed ("processing facility"), and which may also have an office for order intake, billing, bookkeeping, filing, payroll, and other administrative functions. When a disaster strikes, both of these locations may be affected. The hives in your apiary may be destroyed, and your bees killed. The building which houses your processing facility may suffer severe physical damage, and may need to be totally demolished and rebuilt. And some or all of the beekeeping and office equipment which is kept inside of the building (e.g., honey extractor, pump, and bottler; computer, laser printer, phones, fax, and copier; and spare hive boxes, boards, frames, and covers) may be damaged or destroyed, and will need to be replaced.

In the aftermath of a disaster, the survival or continuation of your commercial beekeeping operation will depend on how quickly both your bees and processing facility can be repaired or rebuilt, and your bees, beekeeping and office equipment can be replaced. So the purpose of a good disaster plan is to show you what steps to take *in advance* of a disaster to reduce the risk of damage, and make it easier for your operation to

NATURAL DISASTERS: CAN YOUR BEEKEEPING OPERATION SURVIVE?

— Sylvia A Ezenwa, J.D

It's a simple message: Be Prepared.

recover and rebuild after it is all over. There are three critical components of any good disaster plan: (1) preparedness; (2) recovery; and (3) insurance protection.

(1) Preparedness

How well prepared your beekeeping operation is for a disaster depends on the steps you take before the event to reduce the risk of fire, wind, flood, and seismic (i.e., earthquake) damage to both your apiary and processing facility.

To reduce risk of fire damage:

- Locate your processing facility in a fire-resistant building, i.e., one made of non-combustible materials, with fire walls to hamper the spread of flames.
- Install a fire alarm that will alert the local fire department in case of a fire.
- Install fire extinguishers and smoke alarms, and test them regularly.
- Hire an electrician to look for and repair faulty wiring.
- Store flammable chemicals (e.g., acetic acid and petroleum-based cleaning solvents) in a locked, fire-proof storage cabinet that is clearly marked "flammable," and ban smoking nearby.
- Store smoker fuel (e.g., wood chips, cotton fiber, burlap bags, and smoker pellets), matches, and stick lighters in a secure area, away from any flammable chemicals in the processing facility, and away from wooden hive boxes in the apiary.

To reduce risk of wind damage:

- Locate your processing facility in a building that conforms to the wind-resistance standards in the applicable building codes. For instance, before constructing a honey house, visit the office of your city's building department. Find out which building codes (and wind, flood, or seismic damage-resistance standards) apply to your area; and then, during construction, communicate often with your contractor to ensure that the newly constructed building conforms to those codes and standards. If purchasing or leasing an existing building, obtain written assurances from the seller or landlord that the building, at least, conforms to the building codes and damage-resistance standards that existed at the time it was originally built.

To reduce risk of flood and seismic damage:

- In a flood plain or other flood-prone area, locate your

processing facility in a building that conforms to the flood-resistance standards (including water-resistant flooring, wall and ceiling materials) in the applicable building codes. Likewise, in an earthquake-prone area, locate your processing facility in a building that conforms to the seismic-resistance standards in the applicable building codes. [For information on flood maps and preparedness, visit the Federal Emergency Management Agency's Web site at <http://www.fema.gov/index2.shtm> (last accessed October 2, 2005)].

- In a flood plain or other flood-prone area, or in an earthquake-prone area, even if your processing facility is located in that area, try to find a permanent location for your apiary off of the premises, so your bees will not face the constant threat of damage.

(2) Recovery

How well your beekeeping operation recovers from a disaster depends on the steps you take before the event to safeguard your beekeeping and business records, and to find temporary locations for your apiary and processing facility, and reliable, alternate sources of beekeeping and office equipment.

To find a temporary apiary:

- Make advance arrangements with growers and beekeepers in neighboring communities about providing a temporary location for your colonies, so that when a storm warning is issued, you can quickly move your bee hives out of harm's way.

To find a temporary processing facility:

- Make advance arrangements with beekeepers in neighboring communities about temporarily sharing honey extracting and processing equipment while your original location is being repaired or rebuilt.
- Contact different beekeeping equipment suppliers about the availability and cost of used extractors, pumps, bottlers, and other extraction and processing equipment. Do the same with vendors of used computers, laser printers, copiers, and scanners. After a disaster, if your business is cash-strapped, buying used, refurbished, or older models of normally high-priced equipment can be a viable and cost-efficient option.
- Establish relationships with *different* suppliers of bees (preferably, local) and beekeeping equipment, so that you will feel confident about working with a different supplier if your primary supplier is unable or unwilling to make a scheduled delivery.

To safeguard beekeeping and business records:

- Convert hard copy or paper *beekeeping* records (on colony management) and *business* records (e.g., customer account information, inventory lists, and accounts payable and receivable ledgers), into electronic records or computer files. For instance, handwritten notes taken in the apiary should be typed into a word processing document or spreadsheet on your computer, or else, copied and scanned into a computer file.
- Routinely backup or save electronic records. For instance, save word processing documents or spreadsheets in active computer files each time you work with them; but also, routinely (perhaps, once or twice

“Small and mid-sized commercial beekeeping operations should consider purchasing a businessowners insurance policy.”

a month) save each computer file on removable media, such as a backup tape or CD-Rom, and store those media in a secure, weather-resistant location off-premises.

- Store original copies of financial, real estate, and insurance records (e.g., tax returns, commercial leases, business insurance policies, and bank statements) in a fire-resistant safe on the premises, and store duplicate copies in a bank safe deposit box or other secure location off-premises.

To compile a disaster survival kit:

- Keep a disaster survival kit on the premises in case you are at your processing facility when a disaster strikes. The kit should include first-aid materials; flashlights and batteries; candles, holders, and matches; non-perishable and canned food items, a knife or manual can opener, disposable plastic cutlery, and bottled water; a battery-operated radio or television; a cell phone; and cash.
- Keep basic tools and building supplies on the premises (e.g., hammer, nails, plywood, and duct tape) to make minor repairs to the roof, walls, and windows of the facility during a disaster.

To compile contact information:

- Keep a list of *emergency* phone numbers (e.g., federal and state emergency management agencies and personnel; local fire and police departments; area hospitals; and employees' homes and cell phone numbers) both on and off-premises.
- Keep a list of *business* phone numbers (e.g., beekeeping and office equipment suppliers, landlord (if renting commercial property), insurance companies, banks, local beekeepers, and customers) both on and off-premises. After a disaster, having a single list of important phone numbers may spare you from spending time searching through debris for telephone directories, and customer and supplier files.

(3) Insurance Protection

After a disaster, whether your apiary and processing facility can be repaired or rebuilt, and your bees, equipment, and records replaced, depends on the steps you take before a disaster to obtain adequate insurance protection or coverage.

Selecting a policy

Small and mid-sized commercial beekeeping operations should consider purchasing a businessowners insurance policy. Businessowners insurance policies (BOPs) are “package” policies that combine protection against the risks of both property damage and liability in a single policy. Meanwhile, large commercial operations should select separate property and liability poli-

“Unfortunately, after a disaster, many business owners call their insurance companies only to discover that their policies do not cover the type of damage suffered by their businesses.”

cies, so that each policy can be tailored towards the specific, and usually greater, risks associated with running a large enterprise. BOPs generally include the following kinds of insurance coverage:

(i) Property insurance

Property insurance will generally pay to repair a building and replace any of its contents that were damaged by a covered disaster. However, not all disasters are covered. Flood and earthquake damage are usually excluded from property insurance policies. So you should purchase property insurance coverage for both your apiary (bees and hives) and your processing facility (building, and beekeeping and office equipment). And if your apiary or processing facility is located in a flood plain or other flood-prone area, consider purchasing separate flood insurance from the National Flood Insurance Program. [For information on flood insurance, visit the Federal Emergency Management Agency's Web site at <http://www.fema.gov/fima/nfip.shtm> (last accessed October 2, 2005)]. Likewise, if your apiary or processing facility is located in an earthquake-prone area, consider purchasing either separate earthquake insurance; or a commercial property earthquake endorsement, which will add earthquake coverage to your property insurance policy for an additional premium. But regardless of where your processing facility is located, you should consider purchasing an Ordinance or Law endorsement, which will add to your property insurance, coverage for extra costs incurred in demolishing a building and reconstructing it to conform to new or updated building codes.

(ii) Business interruption insurance

Business interruption insurance will reimburse the income lost if your beekeeping operation's original location shuts down as a result of physical damage caused by a covered disaster. Just as with property insurance, income lost from damage caused by floods and earthquakes is usually not covered. "Business income" refers to the profits that your operation would have earned had the damage not occurred, plus operating expenses (e.g., electricity and payroll) which continue despite the temporary shut down.

Business interruption insurance will also reimburse the extra expenses, over and above usual operating expenses, you incur in continuing to operate out of your original location, or in operating from a temporary location, during the repair and rebuilding period. Finally, it is important to purchase enough business interruption insurance to sustain your beekeeping operation for more than a few days after a disaster; and

there may be a 48-hour waiting period before coverage is slated to begin.

(iii) Liability insurance

Liability insurance will pay your operation's litigation costs (e.g., damage awards, court and attorney's fees) when a visitor to your premises suffers bodily injury or property damage as a result of a dangerous condition or defect on the premises. For example, a bodily injury suffered by a delivery person who slips on spilt honey in your processing facility will be covered by liability insurance. But what is *not* covered are bodily injuries caused by defective honey jars and candles or contaminated honey; you need to purchase a separate product liability insurance policy to cover these situations.

Updating a policy

Review your businessowners insurance policy bi-annually, and update the coverage amounts when necessary. For instance, increase your property insurance coverage when you make a major improvement to your processing facility, or increase the number of hives you operate, or purchase a new extractor or computer. Likewise, increase your business interruption insurance coverage when your beekeeping operation experiences sudden growth, resulting in higher profits and operating expenses.

Unfortunately, after a disaster, many business owners call their insurance companies only to discover that their policies do not cover the type of damage suffered by their businesses. To prevent this from happening to you, talk with your insurance agent now, before a disaster strikes. Make sure that he or she is aware that you are running a beekeeping business. Discuss the number of hives you run; the kind of processing and office equipment in your processing facility; and most importantly, how much it all costs. Remember, as a beekeeper, you are engaged in an occupation that is unfamiliar to most insurers, so you need to work with your agent to customize a business insurance policy that best suits your operation's size, scope, and specific needs.

Conclusion

In the aftermath of a natural disaster, many damaged businesses shut down and never reopen. By developing and following a disaster plan, your beekeeping operation will, hopefully, avoid a similar fate. **BC**

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BIOGRAPHY: Sylvia A. Ezenwa is a lawyer, author, and freelance writer based in Superior, Colorado. She is licensed to practice law in the State of Texas.

DISCLAIMER: The information in this article is not intended to constitute legal advice. Please consult an attorney regarding your specific situation.

Modern beekeeping is based on four key inventions from the 1800s: the movable frame hive, the bellows bee smoker, the honey extractor, and comb foundation. Over the past two decades, the technology of comb foundation has changed markedly, expanding the types of foundation available to beekeepers. Previously, comb foundation consisted simply of sheets of beeswax – sometimes reinforced with wires – that were fitted to wooden frames. Now, however, beekeepers have the additional options of plastic foundation fitted to wooden frames, and one-piece plastic frames and foundation (see Table). Under favorable conditions, bees will accept and build comb on plastic foundation, and many beekeepers have adopted this technology.

Until recently, no one had investigated whether or not combs built with plastic foundation provide the bees with a fully suitable substrate for performing the waggle dances that they use to recruit hive mates to food sources. If not, then such combs may hamper a colony's recruitment communication and thus lower its honey production. Several studies (Tautz 1996, Tautz and Rohnseitz 1998, Sandeman et al. 1996) have shown that bees performing waggle dances rely, at least in part, on vibrations transmitted through the comb to attract other bees to follow their dances. Because plastic foundation is much heavier and much stiffer than beeswax foundation, it may be that combs built on plastic foundation are inferior at transmitting the attractive comb vibrations produced by a waggle dancing bee. Working with two colleagues, Adrian Reich and Jürgen Tautz, I have studied whether plastic comb foundation hinders waggle dance communication (Seeley et al. 2005). I would like to share with you some of the methods and results of our study.

PLASTIC FOUNDATION

Does It Mess Up The Message?

Tom Seeley

Does plastic hinder waggle dance communication?

The main experiment in our study was one in which we determined whether waggle dances produced on combs built with plastic foundation, relative to those produced on combs built with beeswax foundation, are less effective in recruiting bees to a food source. To accomplish this, we installed a colony of approximately 4000 bees in a two-frame observation hive, trained 10 labeled bees to forage at a sugar water feeder approximately 1000 feet from the hive, and then video recorded the dances of these

for three 40-min periods on each day of the experiment.

During each 40-min period of data collection, one of three different frames of comb was installed in the lower position in the observation hive, which is where the bees performed their dances. One frame (BW) contained comb built on beeswax foundation (Kelley's Ripple Wired Foundation) in a wooden frame. One frame (PW) contained comb built on plastic foundation (Pierco Snap-in Foundation) in a wooden frame. And one frame (PP) contained comb built on plastic foundation in a plastic frame (Pierco one-Piece Frame/Foundation). All the frames of comb had the same history: built and filled with honey by one colony the previous summer, and then emptied of honey (extracted) the previous fall. A sheet of queen excluder material between the two frames of the observation hive kept the colony's queen on the upper frame of comb and so prevented her from laying eggs in the lower (test) frame of comb. So except for a few cells of honey acquired over the course of the experiment, each frame of comb that we tested consisted of open and empty

cells.

At the end of each day, we patiently reviewed the video recordings made during the three 40-min data collection periods that day and we counted the number of waggle runs produced by the 10 foragers visiting the feeder. Then, knowing both the number of bees recruited and the number of waggle runs produced during each 40-min period, we calculated the waggle dance effectiveness (measured as the num-



The two-frame, glass-walled observation hive mounted in the laboratory. The hive's entrance is at the lower, right hand corner of the hive and is connected to the outdoors through a wooden tunnel. Inset – Bee imbibing sugar solution at the feeder. She has been labeled for individual identification with paint marks on the thorax and abdomen. (photos by Tom Seeley)

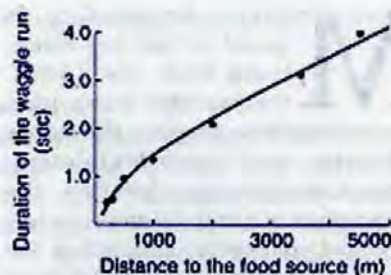
10 bees and measured their recruitment of hive mates to the feeder. Recruitment was measured as the number of recruits (unlabeled bees) arriving at the feeder. Each recruit was captured in a plastic bag upon arrival at the feeder to restrict the dancers for the feeder to the 10 labeled bees and to prevent overcrowding at the feeder. The number of dances (waggle runs) for the feeder and number of recruits to the feeder were measured



The waggle dance of the honey bee.— the patch of flowers lies along a line 40° to the right of the sun as a bee leaves her colony nest inside a hollow tree.



To report this food source when inside the nest, the bee runs through a figure-eight pattern, vibrating her body laterally as she passes through the central portion of the dance, the waggle run.



The relationship between the distance to the flowers and the duration of the waggle run.

ber of recruits per waggle run) for each of the three 40-min periods, that is, for each of the three types of comb. We collected data on six days, giving the bees the test combs in different orders on different days, and using two different sets of test combs (one BW, one PW, and one PP comb in each set) on days one to three and on days four to six. If combs built with plastic foundation do hinder waggle dance communication, then the dances performed on the PW and PP combs should have lower effectiveness (recruits per waggle run) than those performed on the BW combs.

What we found, however, was that dances were equally effective on the three types of comb. For each, the average dance effectiveness was 0.05 recruits per waggle run. In other words, regardless of the type of comb on which dances for the feeder were performed, one recruit showed up at the feeder for every 20 waggle runs produced in the hive. Clearly, as a substrate for waggle dances, the combs built with plastic foundation were just as good as the combs built with beeswax foundation.

It should be noted that the results described so far are based on bees performing waggle dances that were illuminated by daylight, as this light was needed for the video recording. Having found no effect of

comb type on dance effectiveness, we wondered if this was because the dances were performed in daylight. Perhaps dance followers had easily found the dancing bees by seeing their body movements rather than by detecting their comb vibrations. If so, then any differences among the comb types in vibration transmission would not have mattered in our experiment. To see if we had obscured an effect of comb type on dance effectiveness by studying dances performed under lighted conditions, we performed another test. For each type of comb, we checked whether dances were less effective when performed in a darkened hive than in a lighted one.

We reasoned as follows. If the dances on combs with plastic foundation were as effective as those on combs with beeswax foundation only because dances produced in a lighted hive are unusually easy to find, then we should find that dances on combs with plastic foundation are less effective when performed in a darkened hive than on a lighted one. So, using the techniques already described, we made recruitment measurements under constant conditions (good weather, steady air temperature, feeder always filled, etc.) except that part of the time the observation hive's cover was off (hive lighted) and part of the time the cover was on (hive

darkened). For all three types of comb, we found no sign of reduced recruitment with a darkened hive. We conclude, therefore, that our initial finding (no hindrance of dance communication by plastic foundation) also holds true for dances performed in darkness, which is the normal situation inside a hive.

The overall conclusion from this study is that combs built with plastic foundation provide a fully suitable substrate for waggle dance communication. Please note that this conclusion holds true both for combs built on plastic foundation mounted in a wooden frame and for combs built on plastic foundation manufactured within a plastic frame, for we tested combs of both configurations.

Bottom line: even though the use of plastic foundation results in an unusually massive, stiff, and strong midrib within a frame of comb, it does not impair the marvelous communications of our little partners, the bees. **EC**

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Tom Seeley is a Professor of Biology in the Department of Neurobiology and Behavior, Cornell University, in Ithaca, NY.

Trade names and manufacturers of the plastic comb foundation that is sold in the United States.		
Foundation and frame type	Trade Name	Manufacturer
Plastic foundation mounted in wooden frame	Pierco Snap-In Foundation	Pierco, Inc.
	Plasticell Foundation	Dadant and Sons, Inc.
	Rite-cell Foundation	Mann Lake, Ltd.
One-piece plastic frame and foundation	Pierco 1-Piece Frame/Foundation	Pierco, Inc.
	EZ Frame	Dadant and Sons, Inc.

RESEARCH REVIEWED

Explaining • Defining • Using

Steve Sheppard

"The two papers together provide insight from the past that may help us view a possible future for Varroa control."

We are often attentive to the latest news and current events in our particular fields of work or play. Therefore, the immediate market value of honey, the prices of mite treatments and woodenware and the truck-numbing costs for fuel are matters well established within the short term memory of beekeepers. However, those willing to look to the past with more than a passing glance can often detect patterns that are highly relevant in the reality of the present.

As a simple example of this past-future continuum, recall that the experience of European beekeepers in dealing with the mite *Varroa destructor* predated that of U.S. beekeepers by decades. As various miticides were used and overused within the European community...what do you think happened? You guessed it! By the early 1990's, some populations of *V. destructor* were found that were resistant to control by fluvalinate (the active ingredient in Apistan strips). Meanwhile, here in the U.S., all seemed well...as "our" mites were easily controllable using that same active ingredient. However, about five years after resistant mites developed in Europe, beekeepers in the U.S. faced the same challenge when fluvalinate-resistant mites were first detected and then became widespread and commonplace. Whether the development of resistance could have been delayed in the U.S. through more circumspect use of mite control products is a moot point now, but this story provides a clear example of how an awareness of the past at least provides the potential to help us plan the future.

This month, I would like to take a look back in time at a couple of

research papers that brought forth information or ideas that remain timely even today. The first of these is by Dr. Wolf Engels and colleagues and was published in 1986 (Engels et al, 1986). While the language of the paper is German, the work took place in Brazil. The researchers compared the infestation of Africanized and Carniolan honey bees by *Varroa destructor* when maintained in the same apiary at the University of Sao Paulo. The experimental apiary included 11 colonies headed by Carniolan queens and nine colonies headed by local Africanized honey bees. Over a one year period, the researchers measured mite infestation levels and several other parameters related to mite population growth in all the colonies. The main finding of this study was that the mean infestation level in the Carniolan colonies was "much higher" than in the Africanized honey bees. Similarly, rates of mite invasion into worker brood and mite reproduction were higher in the Carniolan colonies than in the Africanized honey bees. Engel and colleagues concluded that the "reduced virulence of *Varroa*...in the Brazilian tropics...depends not only on climate, but also on race-specific attributes of honey bees."

Almost 20 years after the publication of this research, how has this idea grown? For a quick answer

to this question, open almost any beekeeping magazine (such as the one in your hands) during the queen shipping season and look through the advertisements from queen producers. In a number of these ads, you will find prominent mention of the specific selective criteria being employed by breeders to reduce mite susceptibility in the bees they sell. The notion that the eventual solution to the *Varroa* mite problem will

involve genetic improvement of honey bee stocks, rather than reliance on another version of a miticide strip, appears to be increasingly mainstream.

The second paper visible in our rear view mirror was published by Dr. Marla Spivak of the University of Minnesota about 10 years ago and represents some of her early experimental work on

honey bee behavior. In this research, she evaluated the role of honey bee hygienic behavior as a possible defense against *Varroa destructor* (Spivak, 1996). The research compared the mite removal behavior and grooming effects of bees from colonies selected to express hygienic behavior (the ability to remove freeze-killed brood within a 48 hour period) to those that were non-hygienic (did not remove such brood within one week). For her experiments, the author allowed the bees in each colony to rear brood in special comb devices known as Jenter boxes. Jenter boxes permit a researcher to introduce adult mites into capped cells (containing developing brood) from behind, without



disturbing the cappings. For control cells, the rear plug was opened and closed, but no mites were introduced. In the first year of the experiment, significantly more mite infested pupae were removed by bees in the hygienic colonies than in the non-hygienic colonies. The experiment was repeated, although in the second year, the results showed no significant differences between the two bee types. Other experiments in this study looked at the effect of multiple mite infestations, grooming behavior and colony infestation levels. The author concluded that "because the non-hygienic colonies generally did not detect and remove significant amounts of infested pupae, the results of the experiment indicate that the freeze-killed brood assay is a useful screening procedure in selecting colonies for their ability to remove pupae infested with *Varroa*." Interesting, almost 10 years later, the behavioral trait of hygienic behavior has become something of a household word among beekeepers, as it is commonly used in honey bee selection programs to enhance the resistance of bee stocks to foulbrood diseases. On the research side, a close relationship between hygienic behavior and another well-known selectable trait

known as "suppression of mite reproduction" (SMR) has been reported. Overall, it is likely that hygienic behavior will continue to play an important role in honey bee breeding programs for the foreseeable future.

In summary, the two papers together provide information from the past that may help us view a possible future for *Varroa* control. The work of Engels et al (1986) indicates that based on this 20 year old study, the *Varroa* "problem" might be solvable through honey bee selection and breeding. The work of Spivak suggests that the selectable trait of hygienic behavior may be one of the most relevant applications for both disease and mite control.

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*Friendly thoughts go out to you so often through the year,
That it's a joy to get in touch
when Christmastime is here.
And as this greeting comes to you, remember that it brings
The best of wishes from the heart
For many happy things!*

Merry Christmas!
Happy New Year!



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Shaker Style

The plain functionalism of Shaker furniture inspired this beehive table. Easy to make, it requires at most a couple evenings to complete. Consider making several at once. It's more efficient and a beehive table makes an interesting conversation piece or an unusual gift. Set some out at the farmer's market with your honey. This piece blends well with the popular country style and you'll find many honey users attracted to a simple piece of furniture made from a bee hive.

Preparation

The tools needed are found in most small shops: a table saw, band saw, jointer, small planer, hand drill, clamps and sandpaper. Before starting, sharpen or replace dull blades.

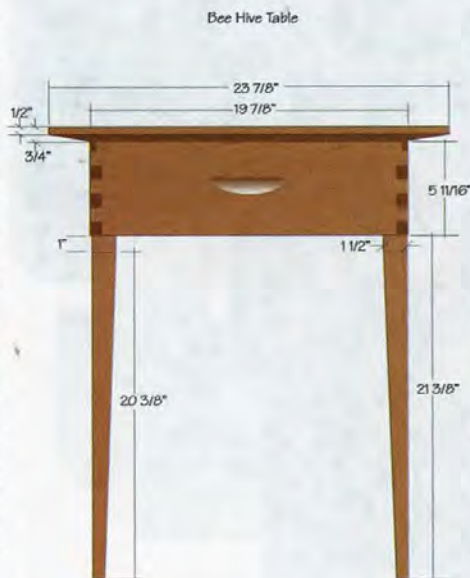
Assemble the materials. In addition to the shallow super, it takes about eight board feet of lumber to make the legs and top, allowing a little extra for scrap and trim. It may not be possible to locate the same species of lumber for the top and legs as the super. If you prefer a clear finish, select a similar species. Tulip poplar will not clash with most softwood species. Its grain resembles that of most softwoods and the greenish heartwood fades to a light gold within a few months.

Prepare the Super

Most supers clean up nicely. I used a more expensive clear super but the knots and streaks found in commercial grade supers give a more rustic appearance. Work quickly when gluing the box together. Do a dry run to make sure you can assemble and square the super before the glue sets. After spreading the glue, assemble the super. Drive in just enough finishing nails to hold all the parts tightly, then check with a square. Once the glue sets, countersink the nails. Press wood filler into all the nail holes. Sand flush after the filler dries.

Once the glue and filler cure, sand the outside of the super with #80 grit sandpaper until the finger joints are flush, then finish with progressively finer sandpaper - #150 grit is smooth enough unless you love to sand. Finish by lightly rounding all the sharp edges.

Glue the top supports flush



with the top of the super. Two pieces $5/8" \times 1 1/4" \times 14 3/4"$ fit into the rabbet and two adjacent pieces $5/8" \times 1 1/4" \times 16 11/16"$ provide a surface for attaching the table top to the apron.

Making Legs

Plane the squares to $1 1/2"$ and cut to the finished length. Set up the band saw to cut leg posts. A fussy cabinetmaker will want to cut the legs so that the apron sits perfectly flush on the leg shoulders. It's much simpler to cut the shoulders just a little narrower than the $3/4"$ thickness of the apron, leaving a small ridge. Set the band saw fence $7/8"$ from the blade. Clamp a "stop block" to the fence $4-7/8"$ from the front of the band saw blade. Rip the legs up to the block. Shut off

the saw before backing the blade out of the kerf. Rotate the leg 90 degrees and repeat.

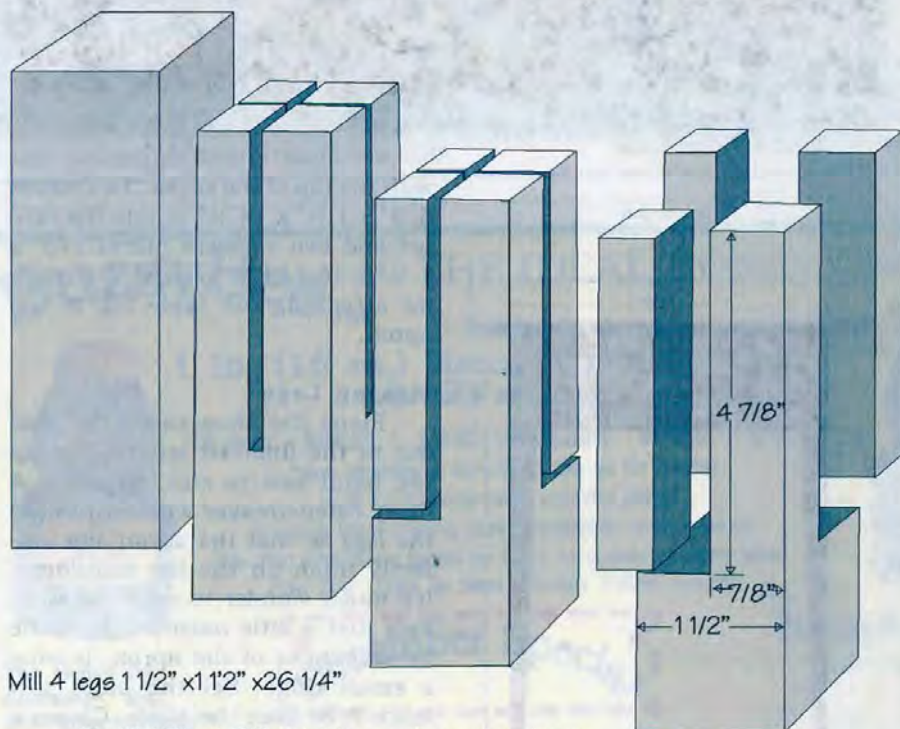
Crosscut the waste pieces from the leg posts on the table saw. Raise the saw just enough to touch the 7/8" square post. Clamp another stop block on the miter guide so that when pushed against the block, the table saw removes the waste wood, leaving a clean square shoulder.

Tapering the legs

There are many ways to taper legs. You can make or buy a taper cutting jig for a table saw. You can saw free hand on the band saw. You can work the legs down on a jointer. One easy way is to use a tapered "piggyback board" (see sidebar). The legs are only tapered on the inside faces and the taper starts about 1 inch below the apron. Mark the taper on all the legs and cut them a little oversize on the band saw. Finish by setting them one at a time on the piggyback board and running through the planer. Take multiple small passes until the taper stops one inch from the post at the top of the leg.

Sand out the planer marks.

Leg Post Detail



Mill 4 legs 1 1/2" x 1 1/2" x 26 1/4"

Rip 13/16" x 4 7/8 thick leg post on a band saw

Remove waste wood with a table saw

Round the sharp corners with sandpaper or a hand plane.

Gluing the Top

Kiln dried lumber is rarely perfectly flat. It may be good enough – planers tend to flatten boards somewhat. If necessary, flatten the lumber on the jointer to remove any twist and cupping, then plane to 3/4" thick. Crosscut slightly oversize. Joint the edges, glue and clamp. Align the boards as perfectly as possible before the glue sets. The closer the edges match, the less sanding later.

Trim the top to the finished size. This may be awkward on a small

Piggyback Board

Start with a scrap 2"x4"x30". Mark the taper on one edge – 3/4" to 1 1/2" in 20". Cut the taper on the band saw and clean up on the jointer (or use coarse sandpaper on a flat sanding block). Draw a line across the taper jig at the thicker end of the taper to help align the legs when planing. You could glue or tack small pieces of wood to the ends of the jig to hold the leg in place. I experienced no slipping at all setting the leg on the jig and running them through the planer.

Help! The top warped

Don't panic. After allowing the top's glue to cure overnight, I found it had warped almost 1/2 inch. Lying flat on the workbench with one face exposed to humid air, it picked up enough moisture to swell. The face against the bench didn't, resulting in an impressive warp. I should have known better. Ideally, the top should be glued, sanded, finished, and fastened to the apron in one day. Since it's good to let the glue cure overnight, the top should have been covered with a layer of flat boards and clamped flat for the night.

Flattening a warped top is easy – flip it over and allow the other side to pick up moisture. As soon as it is flat again, either finish the project or cover and clamp until you can.

table saw. You can make an extension for the saw table to support larger pieces or clamp the top to your workbench and use a hand saw.

Beveling the underside of the table top is optional. It thins the outer edge of the table, giving it a more delicate appearance. If you decide to bevel the top, fasten a wider board to the rip fence to give more support to the top. Tilt the saw arbor 7 degrees. Set the fence just over 1/2" from the blade. Cut the two ends first, then the two sides. Sand all the faces. Round all sharp edges.

Finishing

Apply the finish before assembling the table. The easiest finish to apply is a clear polymerizing oil finish such as Danish Oil or Minwax Antique Oil Finish. These penetrate the wood before drying and accentuate the finger joints by soaking into and darkening the end grain. Polymerizing oils leave a soft satin finish, enhancing the natural beauty of the wood. Follow the directions on the container.

As an alternative style, paint the legs and apron. Finish the top with a clear finish or apply a light stain. Several local cabinetmakers recommend this finishing style because it sells well at craft shows. I used two coats of flat acrylic latex "classic blue" from the Do-it-Best Historic Color selections on the legs

Milling Tapered Legs in a Planer



Mark the taper on a short length of 2x4 with the desired taper



Band saw the taper, then clean up with a jointer or sanding block



After sawing the taper on the leg oversize, clean up by running the leg piggyback through the planer. Turn the leg 90 degrees for the second face

and apron, sanded lightly between coats. The flat paint acquires a soft satin patina when hand rubbed with a paste wax.

When staining the top, apply a coat of pre-stain wood conditioner to prevent uneven color, followed by two coats of cherry stain, then two coats of Antique Oil.

Fastening legs to the apron

Pre-drill the leg posts. Use at least two screws in each leg at right angles to each other, one near the top and one near the bottom. Drill at a slight angle so the drill chuck

doesn't scrape against the apron when you drive the screws.

Attach the top to the apron

Solid lumber expands and contracts seasonally. It's not much of



Leg milling sequence.

a problem in a small top (depending on your local climate, the width may vary from 1/16" - 3/16"). To be safe, drill oversize holes in the top supports, just enough so the screws rattle around in them. Lay the table top upside down. Center the apron on the top and screw it just snug enough to pull the table down to the apron.

Sanding

Always sand with the grain. Start with #80 grit aluminum oxide sandpaper to remove the saw and planer knife marks. Remove the scratches made by the #80 grit with #100 grit followed by #120 followed by #150 grit. That's fine enough, although you can go as fine as #220 or more if you really like to sand. Power sanding tools can speed the process but be careful sanding with power tools - they can quickly dig into the wood, leaving an uneven surface. Some woodworkers don't sand at all, using a cabinet scraper instead.



Glued Table Top.

Trimming the table top.





Beveling underside of tabletop.



Marking leg post length.

Number	Part	Size	Notes
1	Apron	5-5/8" x 16 1/4" x 19-7/8"	One assembled shallow super
4	Legs	1 1/2" x 1 1/2" x 27"	Tapered to 3/4" x 3/4"
1	Top	3/4" x 20 1/4" x 23-7/8"	1/4" x 2" bevel on underside
2	Top supports	5/8" x 1 1/4" x 14 3/4"	Glued to inside perimeter of the super
2	Top supports	5/8" x 1/4" x 16-11/16"	
18	Screws	6x1x1 1/4"	Coarse drywall screws
	Wood Glue		
	Wood Filler		



Attaching braces to the apron.

Sources of Supply

Garreson Lumber Company 1-607-566-8558 or garresonlumber@hotmail.com offers a bee hive table kit: four legs planed to 1 1/2" square and enough planed 3/4" tulip poplar to yield a top and the top supports. You supply the shallow super. Cost is \$19.95 plus shipping. Other hardwoods are available at a small additional cost.

Do It Best Corp. - check doitbest.com to find the nearest store

Classic Blue interior latex flat paint #F264, from the Historic Color Gallery

A natural finished table.



Final Cautionary Note

If you have adult children or grandchildren, watch out. Many older people plan to spend their retirement relaxing and enjoying themselves. Once you make one piece of furniture, you'll find all your descendants will want something from you, especially when that furniture reflects both Grandpa's woodworking and beekeeping activities.

Woodworking Safety

Inexperienced woodworkers will have little trouble with a beehive

table, but if you are unfamiliar with power tools, consider making one as part of an adult education woodworking class at a local high school or community college. Woodworking is a potentially dangerous hobby. If an operation feels dangerous to you, it probably is. Find another tool to do the same job or ask for help from and experienced woodworker. **BC**

Peter Sieling owns and operates Garreson Lumber in Bath, New York, is a prolific writer on a variety of subjects, and is a hobby beekeeper.

OVERWINTERING In The Northeast II

Larry Connor

While putting this article together (Mid-October), New England is subjected to record and near-record rainfall amounts. Bees have been confined to the hives for eight or more consecutive days during the end of the goldenrod and main aster flows in south-central Connecticut. Marginal hives are already dead, and others need to be combined due to lack of strength. Parasitic Mite Syndrome (PMS) and obvious *Varroa* populations are making treatment necessary in hives where IPM methods are used.

And that may be the good news – good because we still have a few weeks in this area to feed, install entrance reducers and mouse guards, administer *Varroa* controls, and combine weak hives. Otherwise it is not good news at all.

Timing of Winter preparations

By the time you read this in early December, it will be too late for most Northeastern beekeepers to do many of these things. Yes, in December some of you can still check colonies, make sure they are in shape for Winter, remove pesticide strips, and reposition frames of honey. Do it on a warmer day when there is some bee flight if possible. Long ago I developed a personal test for working with the bees in cool and cold weather – if I am comfortable in a jacket or light coat while working the bees, it is safe to open the colonies and do what has to be done, but only by doing it quickly and efficiently. If I am chilled to the bone wearing a lighter coat, it is probably a good time to NOT open the hive.

Let's run through a checklist of some of the things you *should* have done this Fall to prepare the bees for Winter, as well as point to those you can still do if the weather agrees. Recalling years with warm December weather when the bees were actively flying and consuming stores and filling the brood nest with honey, reminds me that weather (even before the concept of global warming) creates many of the opportunities and headaches beekeepers face as they manipulate and manage hives. View any warm weather in December as a gift to get things done that should have been done earlier in the season, and not something that happens every year.

Insulation

In southern New England, the use of whole hive insulation is probably a waste of both time and money in all but one or two years in a hundred. At the Vermont/Quebec border, 300 miles north of here, some sort of whole colony insulation is advisable. The amount of protection from prevailing winds is a key factor in this, and I discuss this below.

In some parts of upstate New York and northern New England, as well as many parts of Canada, beekeepers pack and wrap colonies using a number of different methods. Simple wrapping with tarpaper or a slipover carton seems the easiest and are cost efficient. Other methods involve grouping the colonies into groups of two, four, or six and covering them with insulation materials and then wrapping them with tarpaper or some other flexible but hard material. These systems need to address ventilation and rodent control, but provide a thermal blanket that allows the bees considerable protection from extreme tem-

perature drops, along with strong winds, in the Winter. Some beekeepers have even attempted to over-winter nuclei colonies this way, either in groups (apparently to combine heat), or over a double screen placed on a strong colony. The results seem mixed from most of the beekeepers that have shared their failures and successes. If it is a good wintering success, the beekeeper's methods worked. If the bees died, it was obviously due to the weather conditions.

Water vapor and adequate ventilation

When bees consume honey and convert it to heat energy to keep the hive warm in the Winter, they also generate two critical byproducts of respiration: water vapor and carbon dioxide. What happens inside the beehive is no different than what would happen if you put a small animal – like a pet dog – into the hive. There would be a continuous need for fresh air for oxygen needed for respiration, and some way to eliminate the water vapor and car-

Raising queens that overwinter well is time consuming and expensive



bon dioxide. If the hive were sealed up tight, the bees (or the dog) would eventually suffocate due to oxygen. If an air supply was provided, but there was no exhaust ventilation, the bees (or dog) would become wet from the condensation of water vapor and would be under stress from too much carbon dioxide in the chamber.

Natural bee trees and other nests are never airtight, and the bees are able to regulate the size of the hive opening with propolis and/or beeswax. Some strains of bees will close off the entrance to a few holes allowing one bee at a time to pass through. Others leave the opening open. This suggests that the bees have different strategies for regulating the waste products of respiration.

When brood rearing starts in the Winter, the amount of water vapor that is produced is considerable. Many beekeepers have found that an upper entrance or ventilation hole is ideal for the bees to regulate excess moisture and carbon dioxide. As they heat the brood area, the warm, moist air rises, and can be exhausted out the upper entrance.

As a graduate student at Michigan State University, I was fortunate to have Dr. E.C. "Bert" Martin as my major professor. He had started keeping records on wintering at the university apiary when he took the position in the early 1950s, and had considerable data on wintering. Bert kept colonies in three deep hive bodies for Winter as insurance for Winter survival. He had four groups of bees:

Unwrapped and bottom entrance

Unwrapped and both bottom and upper entrance

Wrapped and bottom entrance

Wrapped and both bottom and upper entrance.

When the data were reviewed, the trend was clear. Those colonies that had an upper entrance had a higher survival rate than those without. Wrapping (with tarpaper) did not seem to have any advantage to the survival rates. While these observations were rather poorly conducted as science, they showed the beekeeper the advantage of an upper entrance for Winter survival.

Martin's upper entrance was essentially an inner cover with a

covered landing strip attached to it. It facilitated the bees' flight in and out of the colony on warm days, even if there was snow and ice on the entrance. The university apiary faced south and was located in a small woodlot with ideal wind protection.

Top insulation

A popular system that combines an upper entrance and top insulation has become popular in the Midwest, I suspect in part as a result of Martin's observations. A special screened inner cover is placed on the top of the upper hive body. This inner cover allows bee movement under the screen to the outside. (A variation of this is to use the inner cover with a flight hole down so bees are able to fly in and out of the colony).

Above the screen, an empty honey super or rim is placed. Inside that rim some sort of insulation material is placed on the screen so that it is able to take up excess moisture from the colony below AND provide insulation as well. I have seen various materials used for this insulation, from fiberglass insulation (without the backing, or the backing up away from the bees), dry leaves, corncobs, hay, straw and old blankets/rags. Instead of hitting a cold inner cover, the water vapor moves up and collects in the absorbent materials. The system takes up moisture and wicks it away slowly through cracks in the box and through the upper entrance. The bees are not subject to a shower of melting ice when the temperature warms enough during a break in the weather.

A key reason top insulation works is due to the fact that the top of the brood chamber is warmer, and thus allows the cluster to spread out over the tops of the frames and reach honey otherwise unavailable to the colony without a top insulation system. You can see this when you open the colony in February or March, and a large population of bees covers the top frames of the hive. Providing the food holds out, you have been an assist to the bees.

Windbreaks

As I indicated in the discussion of the MSU apiary, good Winter wind protection is another key to colony

survival. Use my jacket test. Are you comfortable in a lightweight coat while working the bees? Or is there a constant blast of cold air chilling both bee and beekeeper? In the Winter, are you unbuttoning or unzipping the coat as you check the bees for stores, or are you hurrying to finish because you are so cold? While not exactly scientific, it is a suitable way for you to determine how much wind protection the location has, and predict how much stress the colony experiences during the Northeaster Winter.

Remember, bees are able to compensate for low temperatures under remarkably severe conditions, but prolonged cold is stressful and prevents a break in the cluster so the bees can reach new stored food.

Acclimatized stock

For over 150 years beekeepers have been selecting bee stocks that survive in the Northeastern United States and Eastern Canada. These are the colonies that, when all else is equal, will not only survive the Winter, but also do so on a minimum of stored food and build rapidly and grow in strength in the Spring. Stocks of different genetic origins have very different patterns for buildup. For example, Carniolian bees generally Winter frugally and build as the Spring arrives. Italians tend to consume more Winter stores and can be very strong in the Spring if they survive. Reports of Russian stocks indicate a slower buildup, but I know that there are different strains of the Russian bees, so I expect variability in these if evaluated in the same apiary.

Beekeepers face strong pressure to find a stock of bees that fits the local climate, or develop one of their own. The reliance on genetic stock from other areas of the country is counterintuitive if the stock is not acclimatized for the area of production. Migratory beekeeping adds another challenge. Some colonies need to be honey producers in one state, pollinators in another, and a bee producer (for making nuclei colonies) in a third. In addition, they must be tolerant to mites and resistant to diseases, all while maintaining a gentle demeanor.

It's a tough challenge. For most readers of this publication, the development of a stock suitable for his

... but it's the only way you will get the queens you want.

or her beekeeping activities is unpractical as well as nearly impossible. Such a stock must be developed on an area-wide basis, perhaps through local or state beekeeping organizations, but more likely by a local beekeeper that concentrates on the development, production and sale of local queens to area markets. A step-wise approach to such a program would require:

- Evaluation of various stocks available in the marketplace, with emphasis on locally produced or selected lines. The beekeeper would purchase one or more breeder queens, produce daughters from them, mate them to local drones produced by survivor stocks, and evaluate these colonies for one or more years.

- A beekeeper would need to record Winter survival (percentage of colonies alive), buildup rate (frames of brood), mite tolerance (using an ether or sugar roll or some other method), honey production (by weight), temperament (number of stings while working the colonies), and other data. A disease infestation with American foulbrood would remove a colony from further evaluation.

- After several seasons, the beekeeper/queen producer should have an improved line of queens suitable to local conditions.

- The biggest challenge facing such a plan would be the acceptance of a local queen producer as a supplier of queens for neighboring beekeepers. Reliance on March/April queens from such a producer would not be possible unless the beekeeper moved the production of queens to a warmer environment (along with the inherent risks and costs). One option would be for the beekeeper to demonstrate the advantage of Summer increase and Fall requeening to area beekeepers, thus increasing the suitability of using locally produced queens. A few free queens to bee clubs, offered when the beekeeper is able to produce them, would provide test queens for local evaluation. If pleased, the local beekeepers would likely follow with their checkbooks.

It is hard for me to overstate the need for these locally produced queens. With a few exceptions, successful commercial and sideline

beekeeping production has involved careful stock control, either by producing the queens within the operation, involvement in a breeding program (Starline, New World Carniolian, etc.), or a close relationship with a queen producer.

In New England, for example, we need three to 10 quality queen producers, offering queens from May through the end of the beekeeping season. The queens would be available through the season for nucleus production and requeening. Existing hive bodies and supers can be modified and split into multiple mating nuclei, perhaps with a removable divider so the boxes can double as honey supers. Success with a hundred queens the first season could lead to the sale of 500 to a thousand the next. With queen prices of \$25 being discussed for 2006, I think the economics of this sort of venture is favorable for sideline beekeepers to seriously.

Feeding

Winter-feeding is not routinely undertaken by many beekeepers, but during the next two or three months the possibility of the colonies starving increases day by day. The problem of Winter-feeding is again the moisture issue. What can you do to feed bees that does not involve adding water to the sugar?

Some beekeepers feed dry sugar in late February by pouring it onto the inner cover, and letting bees come up through the center hole and liquefy the sugar. This works best for strong colonies with a large bee population. If a weak colony is given dry sugar it will not have enough bees to liquefy the sugar and use it. Ultimately the sugar is wasted. Also, when the bees are in a tight cluster, the dry sugar is often unavailable to them.

Other beekeepers make a honey candy, or fondant. This is a mixture of cane sugar, inverted sugar, and perhaps a tiny amount of very

hot water that is mixed to form a sold mass of sugar. Some bakeries can sell you a mixture of only high fructose corn syrup and cane sugar (do not get the types with stiffeners and additives) used for frosting. It comes in a 50 lb. cube and may be sliced to the desired thickness. Put the slices into gallon plastic bags and keep cold. When you need to use it, simply cut an X into the bag, corner to corner, and invert X side down with the flaps moved out of the way. It might be easier for most readers to buy this than try to mix it themselves! A rim or empty honey super may be needed to keep the bees from being crushed when the lid is placed on the hive. Some beekeepers make a special candy board, an approximately three-inch deep tray that fits the hive, and is inverted with their home made hard-candy fondant set up inside. The bees will gather this food quickly, as hive moisture will further soften the mixture. There is no syrup to mix or spill, and the bees do not have to remove moisture from the food at a time of year they cannot easily do so. Fondant may be put over the bees at any time of the year, and I am surprised more beekeepers don't use it.

A closing report. At the West Virginia beekeepers meeting in October, an empty hive was brought into the meeting hall and filled with weights. Beekeepers were asked to lift the back of the hive and estimate the weight of the entire hive, a practice most beekeepers use to evaluate the food supply of the colony. One beekeeper was within one-eighth of a pound of being right, but a vast majority of the other beekeepers in the room OVERESTIMATED the weight of the colony, some by nearly double the actual weight. If this is typical of our skills as estimators, it sends a word of caution that many colonies weigh much less than we think. A scale hive is such a wonderful teacher, where you keep one hive on a platform scale and record the weight daily or weekly. It will show you when the bees are consuming their stores during the Winter, and are at risk of starvation.

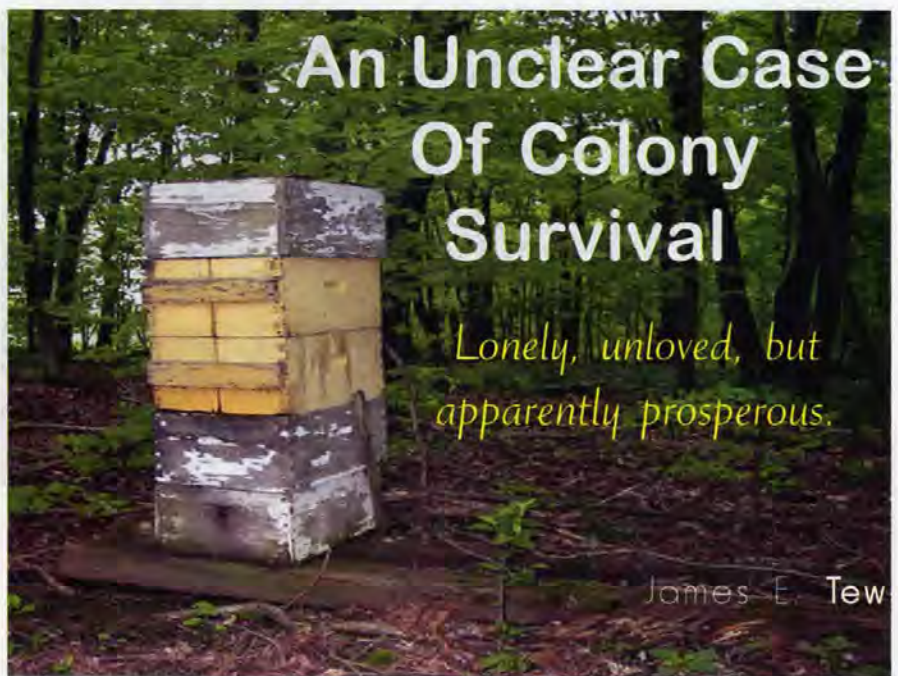
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When you thumb through any issue of *Bee Culture*, you find an eclectic collection of articles covering many aspects of beekeeping and bee related subjects. As is the case with "Trade" publications, all of the magazine's offerings will not intrigue all readers every month. I suspect that if I liked every single article within this particular issue, then there must be someone who wouldn't like any of the offerings in this particular issue. Essentially, though we are all beekeepers we are at different places in beekeeping. Someone dipping candles probably does not have the same immediate interests as one who is trying to produce comb honey or someone else collecting pollen. It's different strokes for different beekeepers. Now hold this concept in mind while I tell you a short story about a beehive.

A long time ago

About 15 or 16 years ago I established a beeyard to exhibit hives from around the world, and other somewhat offhand equipment. It was an interesting yard exhibiting Kenya Top Bar hives, Botswana long hives, a Hayes Barrel hive, an antique sized Jumbo hive, some 8-frame equipment, along with other long gone stuff. Around that time we had a very active international training program, but it has since waned. The yard was always very difficult to access requiring a four-wheel drive to get through the corn, soybeans, or wheat, depending on the crop year. The yard was only occupied for a couple of years before we stopped using it and removed all the equipment (or so I thought).

During times of the year when trees were leafed out, the yard location was invisible, but during Winter months, the distant location could be seen from the highway several thousand yards away. All through the years, as I would occasionally be driving that road, I would glance in the yard's direction and reminisce about the events that transpired there. Strangely, I would frequently think I could still see a hive in the underbrush, but the distance was so great and I was moving at 55 miles per hour so I would ignore my impression and blame it on my imagination. The years passed and then more passed, so



An Unclear Case Of Colony Survival

*Lonely, unloved, but
apparently prosperous.*

James E. Tew

that now soon-to-be 20 years have gone by since we did bee stuff in that inaccessible spot.

Maybe I changed

I don't know why but on a whim, after seeing what appeared to be a distant hive for all these years, last Spring I pulled off the highway and began the trip to the old location. It was the usual rough ride requiring the use of the four-wheel drive option in my old JEEP. After all this time, as I neared the location, but still bouncing in the corn stubble from last Fall, I could see that there was a lone stack of equipment standing there – standing there after more than 16 years of abandonment. For all these years, in fact I *had* been seeing a beehive from the highway. Why had this stuff not rotted? Why was it left here? In fact, what kind of equipment was it? Except for this single stack of equipment, everything else was gone.

Some answers, but more questions

While I don't know why it was left there, for the most part, the abandoned equipment was a modified version of eight-frame equipment. Due to the ugly color and a unique modification that I recognized, I was immediately able to identify the equipment as part of a donation made to my lab by a former editor of *Bee Culture*, now long gone to other pursuits. The stack of

equipment was comprised of manufactured equipment, home-made equipment, and modified 10-frame equipment. It was sitting on what had been a plywood bottom board, but the plywood top was weathered away. As the bottom board side rails rotted away, the original entrance had collapsed, but the equipment was in astonishingly good condition for all the years it had sat there. But the real shock.... it was *full of bees*.

Your mind races

At times like this, my mind races with parts of thoughts and parts of sentences. *What are they.....? A swarm? How long.....? Have they been here for years?*

The hive was top-heavy with honey stores and the bees had just come out of Winter so they had been here at least since last year. The plywood outer cover was essentially gone, formed only by a few strips of veneer, weathered top bar frames and gobs and gobs of propolis. Bees were guarding the holes that were exposed.

Transient bees were using various improvised entrances, but they didn't seem to mind my presence. I wondered if I was the first beekeeper they had ever encountered. I gave the hive a heft from behind – or rather what had been the "behind" of the hive and found it to be heavy, but top-heavy. The bees had



The outer cover of the lost hive.

a lot of yellow color in them and flight activity on that day was good, but not particularly exceptional. There were no dead bees near entrances, nor any indications of skunk or other such harassment – probably due to all the entrances being so high.

In the overview photo, you can tell that some 10-frame equipment was cut down to an 8-frame size. The bottom brood chamber is of commercial manufacture, but the remaining whitish hive bodies are homemade.

Having no hive cover, the bees had made one from propolis. Could bees do this in one season? The propolis/rotted plywood outer cover was far from watertight, but it must have been better than nothing. As the propolis weathered, what would it look like? The amount of propolis needed to cover the top was impressive. The photo does not do it justice. While I know how long the

equipment has been there, I really don't know how long the colony has been there.

You should you have been there, I guess. While I am not trying to make this more dramatic than it was, but it was a truly unusual event. The yard was quiet; the bees were gently going about their business as they seemingly had been doing for many years. There had been no *Varroa* treatments – not one. There had been no swarm prevention procedures. There had been no supers put on or supers taken off. No queen replacements. Even if the hive was empty of bees at times, it has sat upright during blizzards and tornadoes, through heat and cold. It was a moment of marvel. In retrospect, I don't think I would have wanted you there. It was a personal bee moment for me. At one time, this was a vibrant yard of bees sporting all kinds of off-the-wall-hives and beekeepers from



A partial view of the propolis cover.

around the world. I remember people who visited that yard who have since died. I was 16 years younger the last time I was there. And yet, there sat this colony of bees, going about their bee business without an iota of help from a human beekeeper, acting as though nothing was different.

The first paragraph

Now, I ask you to take a moment to reread the first paragraph of this column in conjunction with the following paragraph.

The last time I was in this yard, I was at a beekeeping place in my life where I would have ripped into this colony, replacing equipment, checking for mites, replacing bottom boards and definitely replacing the inner and outer cover. Some of you are at that place right now. As a younger beekeeper I would have completely rebuilt the hive and restructured its innards. But a lot of time has passed and though I am still a beekeeper, I am not *that* beekeeper anymore. I chose to do nothing but marvel at the tenacity of this surviving lost colony, and I decided to keep the colony's secret. Some of you are saying what a waste of a lucky hive. Surely it will die without assistance. In truth, it probably will die, but I saw this colony in a different light. It looks like it has been there for a long time. It was fundamentally a wood structure reinforced with a lot of propolis. A single hive examination alone would destroy the structure.

My only concession – a few days later I returned and put on an old rusted outer cover befitting the hive equipment it sat atop. That's all I have done to help this survivor colony – not exactly traditional beekeeping. *(All articles are not for all people.)*

Some questions & discussion points

1. There is very likely nothing novel about this colony and not very much that is scientifically useful so far as its survival is concerned. I have no basis for thinking that these are "super-survivor" bees.
2. I have no idea how long the present colony has been residing in the hive – maybe a couple of years or maybe the hive was left there because it had bees

in it all those years ago. I have no idea.

3. If the colony has died out during the ensuing years, I don't know where the swarm(s) came from that repopulated the structure. We have no yards near this location. Neighboring beekeepers? Feral bees? I don't know.
4. Having not seen the inside of the hive, I have no idea what the *Varroa* population level is or any other of the attributes of the colony's biology.
5. Not having a bottom entrance seems to have been useful in preventing marauding animals from pestering the colony. I wonder how clean the bees keep the bottom deep. Is it half full of dead bees and colony detritus or do they clear it out every Spring?
6. While the hive has some weight, I have no idea what kind of honey stores it has.

I've taken bee colonies from houses; I've transferred colonies from improvised structures (like old kegs); made splits; and captured swarms, but I don't recall stumbling across a colony that seems so contented in existing without any need of me for what may have been many years. Is it possible for a bee colony to be noble?

Now that you are teary-eyed

Before I submit this colony for some kind of United Nations Award, let me give you an update on an-

other colony about which I recently wrote. Do you recall the story of *An Unclear Case of American Foulbrood*? Well, you should know that as the Summer progressed, the AFB case became crystal clear. That particular noble colony has now gone to the beyond. What initially appeared to be a colony fighting off a deadly bee disease was, in fact, a colony in the early stages of succumbing to a deadly bee disease. That's a big difference.

Could it be, with the present lost hive, that this is a snapshot of an incidental colony that stumbled onto an isolated nest structure that will live there for a while, be confronted with *Varroa*, and then die? Am I looking at a six-month period in this colony's life and assuming - from that six-month period - that this colony is years and years old? Could be. I don't know.

What should I do with this colony?

Though I found the colony last Spring it is now Winter, and making changes now would be a drastic procedure. But what about next Spring? It may be dead by then. But if not, should I see what's inside? Leave it alone? How about leaving it alone, but checking it every few years for live bee flight? What do you think I should do? Let me know. **BC**

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

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Honey Plants

Connie Krochmal



A Purple Loosestrife monoculture. (Larry Connor photo)

Invasive Bee Plants

Invasive plants are a worldwide problem. In the U.S. alone, their economic impact totals billions of dollars every year. It shouldn't come as a surprise that some of these aggressive species are important nectar and pollen plants, including purple loosestrife, and tamarisk.

Purple Loosestrife (*Lythrum salicaria*)

Distribution

Dubbed by one gardening magazine as 'pretty poison,' purple loosestrife has found a home in every state except Florida. Most commonly seen in the Northeast and Midwest, it is also present throughout the Pacific Northwest as well.

Habitat

Purple loosestrife thrives in all climates in partial shade and full sun. Adapted to damp places, and moist soils, this often inhabits ditches. Generally, a wetland species, it is most common along streams, rivers, ponds, lakes, and canals.

Status as a Bee Plant

For years, purple loosestrife has been recognized as an excellent bee plant. Throughout daylight hours in all kinds of weather, the bees work the flowers for nectar and pollen.

Purple loosestrife can yield a surplus of good quality honey. This is often used by the bees as a winter food source. With yellow combs, this honey comes in a range of colors from light to dark sometimes with a greenish tinge. The flavor varies

as well from mild and pleasing to strong. The taste can intensify as the crop gets older.

Description

Also known as spiked loosestrife and purple lythrum, purple loosestrife can reach 1½ to around eight feet in height. This forms a huge clump with 30 to 50 stems. These dense, upright plants grow from woody, thick roots. A mature root can be over 1½ feet long. Hairs cover the stems and leaves. Becoming woody with age, the square to six-angled stems produce numerous branches.

The stalkless, willow-like leaves grow from about four to six inches in length. Quite narrow, they're only one-half inch wide. Sometimes clasping the stem, these are either opposite or in whorls of three or four.

Purple loosestrife blooms over a long period from June through September. These flowers open on leafy, stiff, erect, spike-like racemes up to three feet in height. Very brightly colored when in bloom, purple loosestrife is considered a beautiful flowering plant. The blossoms range in color from magenta to rose or even pinkish-purple. Shaped like propellers, these flowers are almost an inch wide. They have seven petals. The lemon-green stamens come in several lengths with the shorter ones producing the smallest pollen grains.

History

Originally from Europe and Asia, purple loosestrife was introduced to the U.S. during the 1800's by several means. The seeds arrived accidentally in ships' ballast, and were entangled in the fur of sheep. European immigrants who used purple loosestrife as a medicinal plant brought seeds for their gardens. As a popular flowering perennial, this was grown in home landscapes and parks as well as on golf courses. Despite the fact that its invasive nature was recognized as early as the 1830s, it was sold by nurseries until the 1990s.

How Purple Loosestrife Spreads

This highly aggressive plant spreads by both seed and vegetative means. Even the cultivars that were once considered to be sterile are in fact quite fertile. With so many flower stalks, a plant can produce several million seeds every single year. These are easily carried to new areas by wind, water, and animals as well as by farm and construction equipment, and muddy boots/shoes. Remaining viable for five years, the seeds have a germination rate of 50 to 100%.

The plant's underground stems grow about a foot a year and enable purple loosestrife to easily spread. Pieces of the plant can be transported to new sites during construction, ditch clearing, and similar activities.

Legal Status

Over 25 states have classified purple loosestrife and all its cultivars as a noxious weed and/or invasive species. As a result, these regulations prohibit selling, growing, distributing, propagating, buying, or moving the plants.

The Impact of Purple Loosestrife

Purple loosestrife poses a serious threat to aquatic habitats by crowding out the native plant species. As a result, wildlife habitats can no longer provide the shelter, food sources, and nesting sites that are needed. Migratory birds have suffered the greatest loss of habitat.

This perennial also serves as the alternate host for a serious plant disease known as the cucumber mosaic virus.

Control of Purple Loosestrife

Prevention works best. Identify the plants early enough so they don't have a chance to get established.

Control involves physical removal and herbicide treatment. Because digging is so time-consuming, it is only practical when a small number of plants are present. If possible, try to dig them during the early Spring before they get a chance to set seed. After digging, dispose of the plant debris in a hot compost pile or with your regular garbage on trash pick-up day. Once the plants are dug, follow up and monitor the site from time to time for new sprouts. These can be treated with herbicide or pulled.

When purple loosestrife has overtaken a large area, herbicides offer the best solution. The chemical must be one that is labeled for use on aquatic habitats. As with physical removal, it is recommended that you monitor for new sprouts and seedlings after the initial treatment. Re-apply the herbicide if necessary.

Biological control for purple loosestrife seems to be working very well thus far. Two leaf-eating beetles have been released on an on-going basis since the 1990s. Originally native to Europe, these insects can take up to five years to get established. At the present time, they have reduced plant growth at least 70% in most of the release sites.

A species of weevil, a type of beetle, has also been used since the 1990s with some success. In addition, one species of aphid has provided some control in certain areas of the country where it occurs naturally. Though this aphid feeds on the plant, researchers don't expect this to be as much help as the other beneficial insects. It requires an alternate host plant that is not widely cultivated in the U.S.

Tamarisk (*Tamarix spp.*)

In the U.S., about 10 species of tamarisk have naturalized with the most notorious being the five-stamen tamarisk (*Tamarix ramosissima*).

Native to Europe and Asia, these were introduced to the U.S. during the 1830s for wind breaks, erosion control, and ornamentals. Within just a few decades, they escaped in the Southwest. Now, they are found wild in 45 or so states. Yet, most damage occurs in the West where these woody plants occupy over 1½ million acres.

Habitat

Growing to an elevation of around 7500 feet, tamarisk prefers sunny sites with moist soils along waterways, such as streams, rivers, springs, lakes, irrigation ditches, canals, and seasonally flooded sites.

This woody plant is adapted to salty, alkaline soils. The hardiest species are the five-stamen tamarisk, and the small-flowered tamarisk (*Tamarix parviflora*).

Tamarisk's Status as a Bee Plant

In the West, tamarisk is an important honey and pollen plant. The fact that this blooms for such long periods is very helpful to bees.

The plant often yields a good surplus of honey, around 100 pounds per colony. This tends to be dark-colored, usually a dark amber. Somewhat on the strong side, the flavor is reminiscent of horehound. Since



A close-up of the Purple Loosestrife flower. (Larry Connor photo)

this crop can be less than desirable, it isn't usually mixed with better quality honeys.

Description

Tamarisk can assume the form of a large shrub or a small, shrub-like tree with multiple trunks. Depending on the species, it can be deciduous or evergreen. The height varies considerably from five feet to 20 feet or more.

This woody plant has a fine texture due to the small foliage, the thin stems, and the slender, numerous branches. The reddish-brown bark develops ridges and furrows as it gets older. Delicate and scale-like, the foliage is gray-green to pale green.

Very floriferous, tamarisk blooms for an extensive period from Spring until Autumn, producing literally thousands of white or pink blossoms. These have five petals. Generally, the heaviest flush of flowers will be in the Spring season.

How Tamarisk Spreads

The long bloom season allows a single tamarisk plant to produce over half a million seeds annually. A tuft of hairs on the seeds aids

their spread by wind and water. Animals can also carry these to new locations. The earliest crops of seeds have a nearly perfect germination rate. Viable only for about two months, they germinate within 24 hours.

Tamarisk also spreads vegetatively by means of its roots, crown, and stems.

Legal Status of Tamarisk

Also known as salt cedar, tamarisk is officially considered a noxious weed in 45 states, particularly in the West. In addition, it is also classified as an invasive plant in some locales. These regulations make it illegal to sell, distribute, or grow the plants.

The Impact of Tamarisk

Tamarisk is a concern for several reasons. This aggressive plant spreads very fast and grows so quickly (over 10 feet a year) that it overwhelms and displaces native plant species. It diminishes natural diversity and degrades wildlife habitats that ordinarily provide shelter, nesting sites, and food.

Creating a dense thicket, tamarisk establishes a monoculture. These stands pose a serious fire hazard in the West. They also increase the likelihood of flooding along waterways.

With an extensive root system that grows 10 feet below the soil surface, this thirsty plant absorbs all of the moisture it can reach. This causes the water table to drop, leaving native plant species with little moisture.

Tamarisk contributes to long-term soil salinity. This plant exudes



Tamarisk (USDA photo)

salt through its foliage, which becomes deposited on the soil surface when the leaves are shed.

Control of Tamarisk

The best approach is to be proactive. Landowners should never allow it to get established. Monitor all vulnerable areas. Pay careful attention to spots that have been burned or overgrazed, or where the soil has been disturbed. Such sites should be planted with native species that are well-adapted to local growing conditions. With care, these natives can get established before tamarisk makes its presence known.

At a young stage, tamarisk can easily be pulled and destroyed. Once this becomes established and spreads, control becomes harder. Herbicides are often used for tamarisk, sometimes in combination with physical removal. Choose a chemical formulation that is labeled for use on aquatic habitats. As a follow-up, monitor the site for new suckers or sprouts that emerge after the herbicide is applied. If necessary, remove or spray these.

For large areas, root plowing is an excellent way of physically removing tamarisk. This is done to a depth of 1½ feet. In conjunction with the root plow, herbicides can easily be injected into the crowns of the plants.

Other combinations of methods are also effective. One involves cutting the trunks and treating the stumps with herbicide. The shorter the delay between cutting and applying the chemical, the better the result will be. However, this procedure is actually more complicated than it seems. The treated stumps must remain undisturbed until the herbicide has a chance to kill the roots – a process that can take several years. For that reason, avoid burning or flooding the area.

Several forms of biological control work fairly well for tamarisk. One of the simplest is to let cattle graze on the plants. This is a great way to get rid of new sprouts. In some areas of the country, there is a naturally occurring leafhopper that helps to some degree. In California, this species reduced growth in 75% of the cases.

For warmer areas, one particular species of mealy bug has been introduced. Generally, this insect produces several generations a year. A leaf beetle from Asia has also offered some control. This was initially released in some western states in 1999. In its larval and adult stages, it feeds on the Asian tamarisk (*Tamarix pentandra*) and the small-flowered tamarisk.

Tamarisk and purple loosestrife are only two of the invasive plants that are good bee plants. Next time, we'll look at some others. **BC**

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

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TRYING TO BE SANTA'S HELPER

Ann Harman

All catalogs are not created equal.

This year instead of sending my long list of stocking stuffers and under-the-tree items to Santa I am going to give him a bit of help. I am sitting here looking through some catalogs and will try to make a selection and give him the details. I think in the past he has been so swamped with letters that mine must have been overlooked.

What I really need are five medium boxes to be honey supers. Perhaps optimism about spring and summer weather has prompted me to increase my number of honey supers. No point in finding myself short. If the box of five is under the Christmas tree I should be able to put them together and have them painted to be ready by nectar flow. However, being a bona-fide member of the Procrastinator's Society practically assures me of last-minute midnight hammering and painting.

I have chosen three 2005 catalogs and will make some price comparisons, including shipping. Perhaps the reindeer have not liked the selection of hay I leave for them next to Santa's honey cookies. So I will have to figure that shipping cost from the manufacturer to my place here in Zip Code 22627

A comment before we start looking at prices. Why do the suppliers have their catalog index in so many different places? Drives you nuts trying to find the index in order to find your item. Mann Lake has the Index as a centerfold with the shipping information on the next page. Then I pick up the Dadant catalog and find the index at the end of the catalog with the shipping information three pages before the index. In the Kelley catalog we find the

index on page 1 but the shipping information is two pages before the back of the catalog. I guess it gives you a chance to flip through the catalog and notice something you may never have thought about.

Let's see what Dadant has to offer. The index had eight different page numbers for the entry "Supers." I found what I was looking for on page 20, the 6-5/8" Dadant Depth Honey Supers, Not Assembled. I see that although three grades are available, only Select is listed for a carton of five, catalog number B31205. Nails are included. That's handy. The shipping weight is listed as 35 pounds and the price is \$48.15 for the carton.

Now I go to the shipping information. Oh-oh, before I go to the shipping prices I note that a state sales tax will be placed on my order. I live in Virginia and the Dadant branch is in Virginia, so unless I have a tax-free number I will be paying sales tax. Let's see what that is. In Virginia it is 5% so a bit of arithmetic means that the carton will cost \$50.56. Now on to the shipping charges.

I have to determine the distance from the Lynchburg, VA, branch and my home by using the map and map scale on the back of the catalog. Now to find a ruler (I'm beginning to see why Santa tossed my letters aside.) Well, the ruler is marked off in 16th and one inch equals 400 miles, and the distance seems to be 4/16 or 5/16 inch. (Why aren't we using the metric system?) So the distance for shipping seems to be about 100 to 125 miles. Now I move to the chart for shipping costs. Column one goes up to 100 miles. Col-

umn two goes from 101-250 miles. I think I would be safer in choosing Column two. For the 35-pound package I will pay \$13.95 shipping, whether by UPS or by Parcel Post.

Here is my cost for a box of 5 medium depth supers from Dadant:

\$48.15	supers
2.41	state sales tax
13.95	shipping
\$64.51	Total
(that's \$12.90/super)	

Now for a look at the Walter T. Kelley catalog. The index sends me to page 7, Kelley's Medium Depth Illinois Supers, catalog number 38-B. No indication of lumber grade is given on this page and the information given in this particular category does not say whether nails are included or not. I guess an e-mail or phone call is necessary to find out. I do have some nails, but I would hate to run out on that midnight scurry to get supers ready for the nectar flow. Shipping weight is 28 pounds (a seven-pound difference from Dadant) and cost for the five supers is \$47.50, a considerable saving from buying individually.

For shipping charges I need to find my zone. Following my zip code I find I am in Zone four. After reading the various regulations under the zone chart I have decided that my package is not oversize. I hope I am right. (My apologies to the reindeer if I am wrong.)

Next to the 2005 Estimated Shipping Rates. I see that there is a \$2.00 per parcel Delivery Area Surcharge to certain rural area zip codes. I do live in a very rural area but have decided that I probably do

not have to pay this surcharge. If I am wrong I am sure that UPS will find me and charge accordingly. I can, of course, phone the 800 number given in the information and find out. According to the rate table my shipping charge from Clarkson, Kentucky, to my home in zone four is \$12.20.

Here is my cost for a box of five medium depth supers from Kelley:

\$47.50 supers
 12.20 shipping
\$59.70 Total
 (that's \$11.94/super)

My next catalog is Mann Lake. The index lists Super Unassembled on page 7. There I see the Medium Supers color coded for size. The color coding also applies to frames and all kinds of foundation. That is handy. I see I have a choice of Select, Commercial or Budget grade lumber. A photo plus explanation shows me the difference. In order to make a comparison with Dadant I should compare the price for Select. I really do not know how to compare with the Kelley supers except to telephone and ask what grade Kelley supplies.

Towards the top of the page I see a notice: "Don't Forget the Paint and Nails!" Now I know I will have to order nails. I turn to page 22 and find that 7D nails, approximately 200 per pound, cost \$2.20 per pound. I'll order one pound which will give me plenty of extra nails.

Mann Lake does not offer a box of 5 supers; instead prices are given whether you order one or five or up to 49. I am going to figure the cost of five for all three grades.

Select: Commercial: Budget:
 \$44.50 \$34.75 \$29.25

Two notices advise me that shipping charges are not included "Because of fluctuations in the lumber markets..." I am given an 800 number to call. I think what I will do at this point is to try to estimate what the shipping charges might be - a ballpark figure. The Zone Chart and the UPS Shipping Chart can be found in two places: on the order form with the index and on the pages right after the index.

I am in Zone five from Hackensack, Minnesota. What



All I want is five supers and nails. How tough can that be?

should I choose as weight for this estimated shipping cost? How about sort of midway between the 35 of Dadant and the 28 pounds of Kelley, say 32 pounds? Shipping could be about \$14.88, a little more than either Dadant or Kelley but I am definitely farther away from Minnesota than the other two states.

Here is my estimated cost of five medium supers from Mann Lake:

Select supers	Commercial supers	Budget supers	
\$44.50	\$34.75	\$29.25	
2.20	2.20	2.20	nails
\$14.88	\$14.88	\$14.88	estimated
\$61.58	\$51.83	\$46.33	est.total
(\$12.32/ super)	(\$10.37/ super)	(\$9.27/ super)	

I am not done with my comparisons. I need to make some telephone calls. (Now I know - Santa did not just set my letter aside - I'll bet he threw it in the trash. He is a busy man at this time of year.) I need to telephone Kelley and ask what grade the lumber is, whether nails come with the supers and if the package is oversize. I need to telephone Mann Lake to ask for the shipping charges for five supers. I need to telephone UPS to see if there is a rural zip code charge for my zip code.

Here are the results of my telephone calls: The grade of lumber of the Kelley supers is Select (they call it Number 1) and the package of five supers *does* come with nails. Also the package is not oversize. Then I tried the UPS 800 number to see if my zip code is in "a certain rural area" for the \$2.00 surcharge. Well,

five minutes spent on the phone speaking to a computer then finally a person produced absolutely no useful information. Evidently in order to find out I need to know the dimensions of the package. I have absolutely no idea. Would that require another phone call to Kelley? No, the instructions on the rates page said to call UPS. That project was abandoned. Next a phone call to Mann Lake about shipping charges. It seems I was pretty close in my estimate since I was told: "shipping charges would be about \$15 - that's a pretty close estimate."

You can draw your own conclusions from the information presented here. Perhaps I saved you some time. At any rate, I don't advise putting a package of five medium supers in your letter to Santa. I know I'll just ask for something simple - like a book. **BC**

Ann Harman is still trying to order supers, and other gear, from her home in Flint Hill, VA.

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? DO YOU KNOW ?

Fall Management & Physiology

Clarence Collison

Mississippi State University

Fall management is primarily concerned with preparing the colonies for Winter. Successful wintering depends upon colony strength, adequate food stores, colony health and hive ventilation. Although beekeepers check their colonies in the Fall to make sure that they are ready for wintering, honey bees naturally prepare for Winter by altering their basic physiology. In temperate climates, long-lived workers develop in Autumn as the production of brood ceases, or significantly slows before Winter sets in. These long-lived workers

develop unique physiological features over a period of three to four weeks after emergence. These characteristics have been associated with worker longevity. However, what effects do the parasitic mites and diseases have on the bee's immune response and basic physiological condition, especially in preparation for wintering?

Please take a few minutes and answer the questions to determine how familiar you are with these important topics.

Level 1 Beekeeping

1. ___ Worker honey bees generally live longer in the winter than they do in the summer in the northern climates. (True or False)
2. Name what body region the majority of an adult honey bee's fat body is found. (1 point)
3. ___ Honey bee larvae produce large quantities of fat body. (True or False)
4. ___ The integument or exoskeleton serves the honey bee as a primary defense against pathogens. (True or False)
5. ___ The honey bee immune response can involve both humeral (hormonal) and cellular reactions. (True or False)
6. ___ *Varroa* mite infestations are effective in reducing drifting between honey bee colonies. (True or False)
7. ___ The number of female *Varroa* mite feeding perforations found on a honey bee pupa increases throughout the pupal stage of development. (True or False)
8. ___ Female honey bee tracheal mite dispersal occurs primarily during the day. (True or False)
9. ___ Oogenesis and subsequent oviposition of female *Varroa* mites depends on repeated hemolymph meals taken by female mites. (True or False)
10. ___ *Varroa* mites perforate the integument of the host bee pupae with their chelicerae causing cell damage in and around the wound. (True or False)
11. *Varroa* mites have been shown to cause deformed bees, when mite levels are high within a colony. Please describe the appearance of these deformed bees. (1 point)
12. ___ *Varroa* mites affect worker flight activity. (True or False)
13. ___ Within the winter cluster, *Varroa* mites move from bee to bee. (True or False)

Advanced Beekeeping

14. ___ Cessation of brood rearing in late autumn is associated with an accumulation of vitellogenin in worker honey bees. (True or False)
15. Name three defense mechanisms in which

- hemocytes are capable of rapidly reducing the number of circulating particles, including microorganisms, in the honey bee's blood. (3 points)
16. Vitellogenin levels increase in workers after they emerge, but buildup is significantly reduced if the pupal stage is infested with *Varroa* mites. (True or False)
17. Vitellogenin is the main storage protein in honey bee hemolymph. (True or False)
18. Vitellogenin synthesis is initiated by _____ acting directly on the fat body of the insect.
 - A. Peptide Hormone
 - B. Adipokinetic Hormone
 - C. Prothoracicotropic Hormone
 - D. Ecdysone
 - E. Juvenile Hormone
19. ___ The principle site of synthesis of hemolymph proteins is:
 - A. Aorta
 - B. Fat Body
 - C. Ventriculus
 - D. Malpighian Tubules
 - E. Gut Lumen
20. ___ Humeral immune reactions of honey bees in relation to *Varroa* mite feeding and *Nosema* disease are similar. (True or False)
21. ___ *Varroa* mites have been shown to vector all of the following except:
 - A. Deformed Wing Virus
 - B. Cloudy Wing Virus
 - C. Actue Bee Paralysis Virus
 - D. Slow Paralysis Virus
 - E. Sacbrood Virus
22. ___ Parasitization of pupae by *Varroa* mites results in a significant reduction in protein, carbohydrate and lipid reserves of emerging bees. (True or False)
23. ___ *Varroa* mites feeding on pupae results in adult honey bees with reduced water content. (True or False)
24. ___ Honey bees infested with *Varroa* mites have an increased respiration/metabolic rate. (True or False)

ANSWERS ON NEXT PAGE

?Do You Know?

Answers

1. **True** In the northern climates the worker honey bee typically lives five to six weeks in the Summer and five to six months in the Winter.
2. **Abdomen**
3. **True** The creamy colored fat body in the larva is very large, and shows through the transparent skin. Fat tissue, toom is abundant in the larva, but larval cells contain, besides large amounts of fat, glycogen and toward the end of the larval stage, numerous minute protein granules. The fat body is storage tissue used to conserve elaborated food products not immediately needed. Thus, they carry a large supply of food material into the pupal stage where it is consumed by the pupal tissues developing into adult organs.
4. **True** The exoskeleton forms a primary defense mechanism against the entry of pathogens.
5. **True** We commonly recognize two types of immune processes in insects, cellular and humeral (hormonal), although they are probably not entirely independent.
6. **False** Bees drifting between colonies has been shown to contribute to the transfer of *Varroa* mites between colonies, and infested bees drift more frequently than uninfested bees.
7. **False** The number of *Varroa* mite feeding perforations do not increase during host pupal development, since *Varroa* mites puncture their host bee only at the very beginning of the pupal phase. The female mites and their progeny apparently use the same feeding sites throughout development. Therefore, the wounds remain open, providing a long period for unhindered passage of pathogens.
8. **False** Female tracheal mite dispersal occurs primarily at night when the bees are less active and more crowded together, to increase the chances for a questing mite to transfer to a new host.
9. **True** Egg development (oogenesis) and subsequent oviposition by female *Varroa* mites is dependent on repeated hemolymph meals taken by the mites beginning shortly after the brood cell is capped.
10. **True** Perforation of the integument by the chelicerae of the female *Varroa* mite causes damage to the pupal host tissue in and around the wound, affecting the permeability of the epidermal cell membranes. These perforations are used as feeding sites for sucking hemolymph.
11. **Bee deformity** includes malformed appendages (without a leg, crumpled/vestigial wings), shortened abdomens and overall reduction in size.
12. **False** While there has been one report that *Varroa* mite infested workers may start foraging earlier in life, most research has shown that bees that were infested during their pupal period are able to forage as well as their noninfested sisters, as long as they live and can actually fly.
13. **True** Within the Winter cluster female *Varroa* mites transfer often between overwintering living bees and from dead and dying bees on to living bees.
14. **True** The cessation of brood rearing in late Autumn is associated with an accumulation of vitellogenin in honey bee workers. This is believed to be a mechanism for producing bees with large enough protein stores to survive several months on honey only, since most colonies overwinter with very limited pollen supplies in the area where the cluster is located. This protein stored in workers is crucial for survival as well as for brood production in early Spring.
15. **Phagocytosis**
Nodule formation
Encapsulation
16. **True** Vitellogenin levels increase after honey bee emergence in both *Varroa* mite infested and non-infested bees. However, as workers age, bees infested with *Varroa* mites during the pupal stage develop vitellogenin levels significantly lower than bees from non-infested pupae, suggesting that these workers infested by *Varroa* mites as pupae fail to develop key physiological characteristics of long-lived Winter bees, making them less likely to survive until Spring.
17. **True** Vitellogenin is the main storage protein in honey bee hemolymph. The yolk protein vitellogenin is metabolized as a storage protein and is used by nurse bees to produce brood food.
18. **E) Juvenile hormone**
19. **B) Fat body**
20. **False** *Varroa* mite infestations and feeding result in honey bees producing a humeral immune response, whereas, nosema disease does not produce an immune response. It has been suggested that the nosema microsporidia do not come in direct contact with the hemocoel, thus do not cause a reaction.
21. **E) Sacbrood Virus**
22. **False** *Varroa* mite parasitized honey bees emerge with reduced levels of protein, and lower abdominal carbohydrate concentrations. Lipid concentrations are not detectably affected by *Varroa* mite infestation.
23. **True** *Varroa* mite infestations associated with developing honey bee pupae results in newly emerged adult honey bees having reduced water content in comparison to uninfested pupae. It has been estimated that for every female *Varroa* mite present during the bee's development, the host would lose three percent of its body water
24. **True** *Varroa* mite infested honey bees are sometimes described as being 'restless' or 'irritated' because of the mites, which leads to an increased respiration/metabolic rate.

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

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

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

"What about the dessert?" The e-mail bounced in somewhere from the other side and was glaring at me from my computer screen, stabbing me in the eyes with guilt. It came in from cyber space screeching, searching, and sniffing me out like a bloodhound after an escaped prisoner! It obviously came from none other than Ed. I can see him now behind that famous picture, the guy on his office window with the American top hat adorned with stars and stripes pointing a big finger, the caption reading 'Your Ed needs you,' smug in his cozy leather coffee with all those empty mugs of char dotted around him, and yet with one touch of his finger he sends a cold shiver over your spine. I used to think it was a duck wagging over my grave but now I have found its true meaning. An email from The Editor is worse than a duck and what, for all for the love of literature centred around the oldest craft known to man.

I courteously replied, 'when do you need...' but before I had finished - another message flashed up, 'next weekend' It scared the pants right off me, he should be locked up! All this electronic stuff, it's too fast for me. You need to be smoking something to handle it. I had to look over my shoulder to see if he was standing there. Surely all this is a sign of an over-worked Ed. They're clever, they anticipate your every thought and answer it before you send it, smart cookies, they're like something you would see in one of Stephen King's Movies.

Which Way Now?

Desserts, desserts, desserts. Don't you just love them? A great finish to a good meal, like a full stop to a story, and it's even tastier with honey added. Let's see; I have two in mind, one is pretty dangerous but a work of art. It's the exploding chocolate balloon. However, I could include a libel clause. Talking libel over here we seem to be catching up with our American cousins on how to make money out of claims. It used to be that I never understood Americans. I mean lets face it, they took our lovely hot tea and made it ice cold. Then adding insult to injury, they put lemon in it to make it bitter only to turn round and put a load of sugar into it to make it sweet! I'm lost, it beats me.

Then what else? They take our national sport of cricket and spread everybody out all around the pitch, remove the wickets, change the bat and call it baseball. Strange things happen. On saying that, would you believe that the E.U. bureaucrats have now decided that beekeepers should be able to track every jar of honey sold? I preferred the Muppet show, they made more sense. I must move on.

A Beekeepers Real Dessert Indulgence

Let's forget the chocolate until I get clearance from Ed, so I'll not go there. He will probably need me to do a Risk Assessment first anyway. Decisions, so be it a baked Alaska (real name Norwegian Omelette). Let's stick to the Alaska; much nicer There is a brilliant American Pastry Chef called Bo Freiberg. He came up with a Bee Skep and I have moved it around and redesigned a few areas as chefs do just that, for our beekeepers menu.

DESSERT!

A Great Finish To A Good Meal

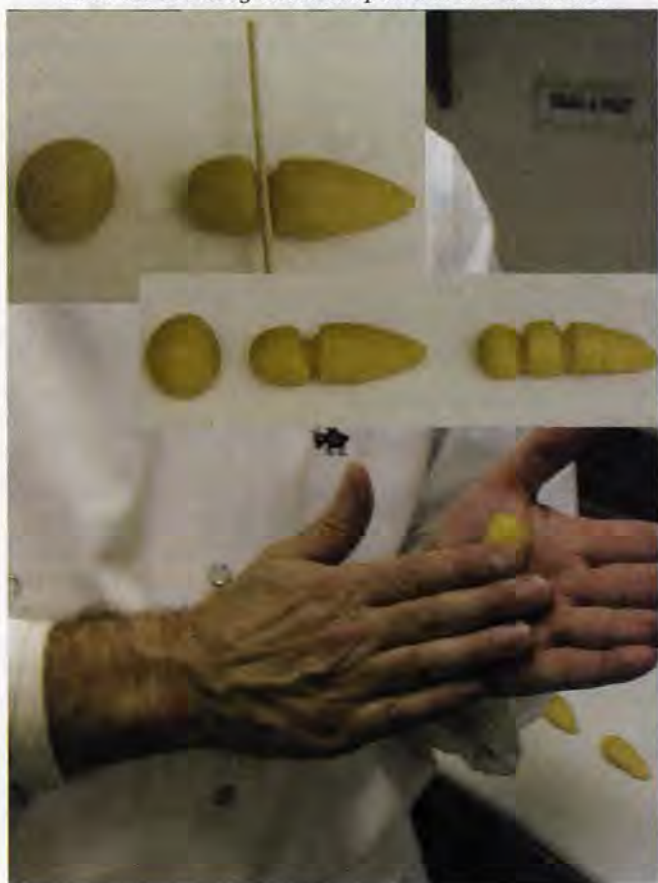
Michael Young

Bee Skep with Italian honeyed meringue, vanilla ice cream, accompanied with a Rhubarb and honey coulis with a marzipan honey bee

You've got to admit it sounds great doesn't it? Well you're right, it does. I have made this before and everyone loves it. Even my mother in law, God bless her cotton socks. This sweet is simplicity in its form. So easy to make you don't have to be awake! It's pure creative lush, a real beekeepers' dessert. Make this sweet and just sit back and watch what happens. The sauce is a purée of rhubarb and is nearly as sharp as my mother in law's tongue, I say nearly so. But first add honey until you tone it down. You don't want it too sweet being that you need to have a little tartness to balance the sweetness of the meringue.

I think it's important to get the base completed ready for dressing up. For this, you can make a Madeira sponge (cake) or purchase a nice piece of sponge (cake). One of the ideas behind this dessert is to take

Make the bee body with marzipan and a small dowel.





Finish the bee with singed pumpkin seeds or almond slices, and a bit of chocolate and honey.

it easy and not slog yourself over the stove.

Get yourself a nice piece of sponge that's not too soft. Using a round cutter Cut it into small round disquettes, around two inches in diameter Place a generous scoop of vanilla, French vanilla, or even better, honey ice cream on top and place in the freezer until later

Next is the marzipan honey bee.

Marzipan Honey Bees

This recipe should make eight bees...

- 2 ounce marzipan (we need to support the almond growers, after all, since they support us so well)
- Little cocoa powder
- 16 Sliced almonds or 16 Pumpkin seeds, large

Two things: Try not to have the marzipan too warm and try not to eat the marzipan as we need all of it.

By following the photographs, firstly roll a small piece of marzipan in your hand into to a ball about the size of a large grape, then into a worm like shape about one inch long with an overgrown head.

With a small wooden stick gently press down along the thick part of the marzipan and rock it back and forwards until you have formed and created the head.

Next, repeat the same process with the stick, a little way down the body to produce the abdomen. It should look very similar to a bee unless you have cut its head off. If so, roll it up into a small ball and start again.



After you've made your meringue and have it in your piping bag, squeeze it out in either circles, or in a spiral, going round and round your sponge cake/ice cream center (seen to the right of Michael) until your skep is complete.



Your meringue should be stiff enough to hold onto a fork.



Once it's squeezed on, singe the edges with your torch to give the skep depth, color and character.

Don't worry if the bee looks a bit of a mutant, we are not looking for the perfect bee. If it looks good and feels good it will do.

With a small pointed knife, make two small inci-

sions either side of the abdomen for the wings (don't get over excited or else your hand will slip and the head could go).

Next task: mix a spit of honey with the cocoa powder, keeping it thick (melted chocolate is better). Dip the wooden stick in the liquid and go to work on the bee, following the photos.

Flight

Place 16 almond slices or pumpkin seeds on a metal tray. Gently move across them with a gas blow torch, don't make them as black as my mother-in-law's heart (shudder). Gently use the torch's heat to catch the edges of the almonds/pumpkin seeds, pretty slick eh? When cool, stick them in the incisions, have a giggle, a cup-a-char and place them to the side. Next step rhubarb, here we come.

Rhubarb Sauce

Look, there are two ways of doing this. If you can get fresh Rhubarb, great. You would need about 1 ½ lbs of stalks. Place in a saucepan and just cover with water and cook out slowly, don't over boil it as this will kill it. Once the rhubarb is cooked, most of the liquid will have been sucked up by the rhubarb or evaporated. Place it in a blitzer and zap it until it's lovely and smooth, then add honey until the flavour is just a little tart.

The other way is by using tinned rhubarb, not as nice but handy if you're lazy. Drain the liquid totally off and just add the honey until it hits the right flavour, easy.

For the coating of the dessert, the finish is meringue but the best type is Italian Meringue, the only difference being is the egg whites are cooked as they are being whipped. It's a great meringue and one worth trying.

A Cosmetic finish

For this task, a sugar thermometer is required; the ingredients are simply as listed below. It's important to use a thick bottom saucepan.

- ½ pint egg whites
- 12 ounces granulated sugar
- 6 ounces light honey
- 8 ounces water

Place the egg whites in a mixing bowl ready to be whisked (don't switch on as yet).

Prepare and boil the sugar, honey and water. When the syrup reaches 230°F (110°C), begin whipping the egg whites on high speed. Continue boiling the syrup until it reaches 240°F (115°C).

Remove the syrup from the heat and lower the mixer speed to medium. Pour the syrup into the egg whites in a thin steady stream. It's important to pour the syrup between the side of the bowl and the whisk (if the syrup hits the whisk or the side it will splatter and cause lumps of cooked egg whites, a glass of wine steadies the nerves).

Once completed turn the mixer back to high speed until the meringue has cooled completely and has formed stiff peaks as in the photo. As I said, the beauty about this is that the whites are cooked. The dessert,



Add enough honey to the rhubarb sauce to make it just sweet enough.

when completed, can go into the freezer for that beekeeper's night at your house.

So let's put it together Flint, Lock & Musket

All is ready now and all we have to do is bring it all together. Before we start showing off, get yourself a cuppa it steadies the nerves. Place the meringue into the piping bag with a plain round nozzle. Bring your creation out of the freezer.

You really need a nice white bowl for this cracker dessert. To stop the dessert moving on the plate put a blob of meringue in the centre of the plate. Place the sponge topped with ice cream in the centre. Starting from the base, pipe the meringue gently round continually spiralling up towards the top of the ice cream. When finished, don't lick the meringue...tut tut! You might find it easier to pipe circular rings from the base until you reach the top. Not bad eh? You've just made a sponge cake and ice cream, meringue-covered skep!

Get the blow torch and point it down from the top of the skep going all around. All you want to do is catch the outside edges, not too much colour and leave white gaps between the ridges.

This dessert can also be browned on the top of the oven or under a grill but you can't show off that way and it's a waste of gas.

Pour the rhubarb sauce gently around the Bee Skep adding the bee and a few edible flowers. Stand back and take a deep breath. Call someone in to show them your creation or keep it as a surprise to the one who shows you up all the time when you go to their house for a meal; serve it and just sock it to them. **BC**



Michael's masterpiece, served in a perfect white bowl, bon appetite, and Merry Christmas!

GLEANNINGS

DECEMBER, 2005 • ALL THE NEWS THAT FITS

NEW HONEY BEE HEALTH RESEARCH AWARD

A new award to promote research into honey bee health was launched at the Apimondia Congress by Vita (Europe) Ltd., the honey bee health and mite control specialists. Valued at up to E10,000, the award will be made on a regular basis to help fund new honey bee health research. Any individual or organization can apply.

"This award is designed to stimulate new research into any of the diseases that affect honey bees,"

explained Jeremy Owen, Sales Director of Vita. "We will be especially, but not exclusively, interested in naturally-based treatments that are really effective since that is clearly a priority for many beekeepers across the globe."

The inaugural winner of the Vita prize is Dr. Alexandros Papachristoforou of the Aristotle University of Thessaloniki in Greece for his ongoing work on chalkbrood control.

NEW WAREHOUSE

Mann Lake Ltd. opened on November 7, a full service warehouse in Woodland, California, off Highway 5 just east of Sacramento, offering a full range of beekeeping

supplies, feeds, medications and High Fructose Corn Syrup for pickup. Reach them at 1250 Harter Avenue, Suite C, Woodland, CA 866.880.7678.

FLORIDA CITRUS THREATENED, AGAIN

The recent discovery of citrus greening (huanglongbing) in samples collected from trees in South Florida poses a definite threat to Florida's \$9 billion commercial citrus industry. Proper identification and eradication methods are needed to reduce the amount of crop loss caused by this disease, say plant pathologists with The American Phytopathological Society (APS).

Citrus greening is a bacterial disease that affects the phloem system of citrus plants causing the infected trees to yellow, decline, and possibly die within a few years. The bacterium is spread by an insect, the citrus psyllid.

Plant pathologists have been surveying and testing for citrus greening since the psyllids were found in the United States in the late 1990s.

A REFERENCE GUIDE TO NATURE'S SWEETENER

The National Honey Board (NHB) recently published an updated version of "Honey: A Reference Guide To Nature's Sweetener," a technical brochure describing terminology about the composition and physical characteristics of honey and processing and storing honey.

Some of the terminology detailed in the brochure includes antimicrobial properties, antioxidants, chemical characteristics, glycemic index, nutritional values

and viscosity. The brochure could be utilized by those involved in formulating new honey products or anyone interested in information related to honey composition and characteristics.

Copies are available on CD and print. Send to order@nhb.org or call 800.553.7162. Specify CD or print. The first copy is free. Additional copies are \$1 each. The brochure may be accessed at www.nhb.org.

NEW ANT LAWS IN CA

The CA Department of Food and Agriculture (CDFA) is proposing a voluntary apiary certification program to facilitate movement of out-of-state bee shipments into CA for pollination, while insuring that pest species of ants are not introduced or disseminated in the state.

This program will be implemented on a pilot basis for the upcoming season. It will allow certified ant-free bee shipments to enter CA, undergo a standard inspection at the CA border, then proceed to destination and offload without requiring supervision by local county agricultural inspec-

tors. Additionally, certified shipments on which five or fewer worker ants are found during border inspection will be allowed to proceed to destination for supervised offloading and detailed inspection with the county agricultural inspector's office. This is a departure from current policy, which has a zero tolerance for ants (including workers) and requires offloading of all incoming bee shipments to be supervised by a county inspector during normal business hours. See www.beeeculture.com for all of the new laws and guidelines.

ABF FINALIZING PLANS FOR LOUISVILLE CONVENTION

A tour to the Walter T. Kelley Co. and a Serious Sideliner Symposium will "book-end" the 2006 American Beekeeping Federation Convention. The convention is set for Jan. 11-14, at the Hyatt Regency Hotel in Louisville, KY. The bus tour to the Kelley plant - with lunch provided by Kelley Co. - will take place Tues., January 10.

The Serious Sideliner Symposium is aimed at those beekeepers who operate fewer than 300 colonies. The goal is to help them become better at what they are doing

through new efficiencies, product offerings and new services.

The Symposium will run concurrently with regular ABF programming, Friday, January 13 and Saturday, January 14. The cost is \$95 with advance registration.

The general convention begins Wednesday morning and continues through Saturday evening. For a pre-registration packet contact ABF Office, P.O. Box 1337, Jesup, GA 31598, 912.427.4233, Fax 912.427.8447, info@ABFnet.org or visit www.ABFnet.org.

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Dear Bee Culture Readers.
Each year we use this December advertising space as an opportunity to extend to you our sincere wishes for the holiday season. At this time we humbly reflect on the value of each of our many customers and friends.

As industry changes, our commitment has not. We have dedicated ourselves to offering you outstanding service, a choice of quality products and value added savings.

We wish to thank you for your continued support and look forward to serving you in the many years to come. May your holiday be filled with joy and may the coming year be filled with Good Health and Happiness.

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and

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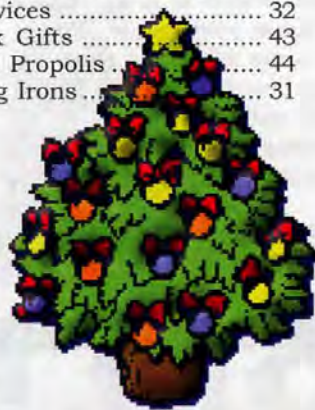
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My dear friend Ann runs the Woody Creek Store, just down the road from Aspen. She buys my honey in 60-pound buckets and packs it herself into the tiniest little jars. She advertises this as "local honey" and charges a fortune.

I haven't seen a lot of Ann since Linda and I moved to New Castle, but last summer Ann and I wound up on a committee together - a committee to recall the local district attorney. One evening our group met at Ann's store, and afterwards Ann said, "Do you want to have dinner with Michael and me here at the store?"

Predictably, I said, "Yes." Ann can flat-out cook.

It was 9 p.m., and the store had been closed for hours. We three had just started in on a most elegantly prepared side of salmon, when a woman walked in.

Ann said, "We're closed," but the woman said, "Oh, couldn't I just look around? I'm gift shopping."

"Sure," Ann said, but she didn't exactly turn on the charm when she said it. Come on, we were eating dinner.

To tell you the truth, I can't say for sure what-all Ann sells besides honey, but the woman bought something. At the cash register Ann said, "You should try some of our local honey." She pulled out a little jar that might have weighed 12 ounces.

The woman said, "How much?"

Ann said, "\$8.95."

The woman said, "I'll take two."

One day I was at Woody Creek delivering 10 gallons of honey that I'd gotten from my beekeeper neighbor Paul in a futures swap. I was temporarily out of honey, but I had a record crop still out on the hives, so Paul loaned me some of his honey. Paul runs bees up by Meeker, among other places, in the northwestern part of the state. The alfalfa honey I was dropping off was faintly cloudy, light product, lovely to look at. I said to Ann, "It's from Meeker."

She said, "I don't care where it's from."

I said, "I just thought you'd want to know."

"Look," she said, "The honey I sell is 'local.' That's all I need to know, and it's all my customers need to know. How much do I owe you?"

I've known Ann for half-a-lifetime, and she can be strictly business.

She and I were talking on the phone just before Potato Day in Carbondale. Potato Day is a big sales day for us here at Colby Farms. Ann said, "How much do you charge for your honey?"

I said, "Nine dollars a quart, \$6 for a pint, \$5 for a 13.5-ounce round glass jar and \$3 for a 12-ounce honey bear."

She said, "You need to raise your prices. You're undercutting your retailers. Plus, no one will respect you if you give it away. You need to charge at least \$11 for a quart."

Ann is a successful businessperson, which is more than I can say for myself. She has a pretty fancy clientele at Woody Creek, but they aren't necessarily the same folks who show up at Potato Day, although some surely do. I've raised prices before and it did seem to stimulate sales. But with light honey at 80 cents a pound wholesale and prices holding steady at the grocery store at \$7-something-a-quart, somehow this didn't feel like the time to try it again.

Ann was insistent, however, and of course I relented. I thought, "Well, shoot, if all I have to do to increase sales is

raise my prices again, I can do that." I figured I'd go a buck a jar on everything.

Cool temps and robin's-egg-blue Colorado skies brought out a good Potato Day crowd. I had no awning over my booth, so the sun shone clear through glass jars of pale high-altitude Flat Tops wildflower honey. People remarked at how attractive the honey looked.

Nobody seemed to balk at my prices, yet when I counted my cash at day's end, honey sales were down 25 percent from 2004. I assumed and secretly hoped that all the other vendors also suffered an off day, but I didn't leave it at that. A day or two later I called Judy the salsa lady. She'd set up her booth right next to mine both this year and last.

"Oh, business was good." She said. "I raised my prices 25 cents a jar, and I was still up 30 percent. All the sellers I talked to said they did really well. Maybe you got a little greedy, and it backfired," she laughed.

I generally run out of honey by Spring. Whenever friends come up with some helpful idea to increase sales, I say, "I don't have any trouble selling honey. I have trouble producing honey." I always figured my honey sold itself.

But that was then. Now I'm sitting on a bumper crop, and Potato Day brought home a lesson straight out of Economics 101. You don't set the price. The market sets the price.

It's true I didn't have Linda to help sell this year, and she hustles. We'd get a ten-dollar bill for a \$7 basket of Golden Delicious apples, and she'd ask the customer, "Do you want a honey bear for change?" She sold a lot of bears that way.

Later, when I teased Ann that her price-raising idea wrecked my Potato Day sales, she wouldn't budge. She said, "You can't prove that's why your business was down." She never gives an inch, the little darling.

Ed Colby

Econ 101

BOTTOM BOARD