MAY 1998

BeeCulture

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- Five Years Of Honey Industry Data

Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

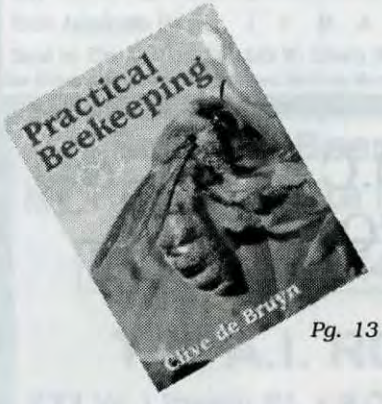
MAY 1998 VOLUME 126 NUMBER 5

FEATURES

COVER
May is pollination time in many parts of the country. This Ohio apple orchard, though a tad ill attended, is well served by the bees, and the beekeeper.
photo by Kim Flottum

DEPARTMENTS

COLUMNS



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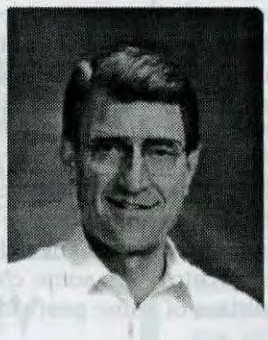

JOHN ROOT
Publisher

KIM FLOTTUM
Editor

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INNER COVER

Almost exactly 12 years ago I came to Washington DC to walk the Halls of Congress with Glen Gibson, then President of the American Honey Producers, to 'touch base' as he put it, and to continue the battle to maintain the honey price support program. I didn't know enough then to appreciate all I saw, and did, but I still have pictures of me and Glen and several of the people we visited.

I came back to DC a few years later when APHIS (Animal, Plant, Health Inspection Service) held the negotiated rule making session with government and industry representatives on the movement of colonies when *Varroa* first became evident. They wanted to reduce the spread of the pest but still allow colony movement for pollination. It didn't work, or work well anyway, but the session was enlightening.

Varroa again brought me to DC in early April. More specifically, a meeting with the EPA about *Varroa* was the reason for this trip. The weather was perfect, the cherries were in bloom, the President had just had one of his court cases thrown out and the town was in a pretty good mood. At least that's what the papers said because all I saw was the inside of yet another airport and hotel.

Anyway, Bayer Chemical Corporation (yes, the aspirin and Alka Seltzer people), had designed a product used to treat colonies for *Varroa*. They already have a couple of *Varroa* products used in Europe so are familiar with the problem, and had had the USDA do some preliminary tests on this new product to see if it worked. It does.

And, with the first inklings of mite resistance to Apistan showing up, they felt that if they got things started now for the registration process, when a new product was needed, or even before, they would be ready. But there's a hitch, with the deceptively simple name of 'The Food Quality Protection Act,' passed last August by Congress. Unanimously passed by Congress last August, I should add.

The Environmental Protection Agency, by action of this Act, was charged with making sure everything that passed beneath their collective nose complied with their interpretation of what Congress meant with this Act.

The aspect of this that affects us, and lead me to DC is as follows. Previous to this Act, if a company wanted to get a chemical registered for use, they first determined a need, then paid the millions of dollars needed to perform all of the toxicological, efficacy, safety and other tests required to produce the data EPA required. One test (of many) was, essentially, worst cast scenario exposure. For instance, a farmer applying a pesticide, legally, would be exposed to how much of the chemical when applying at the full rate, as many times as the label allowed, for as long as he (or she) grew the crop. If it could be shown that when label rules were followed the exposure to this particular chemical was *below* a certain standard, the chemical passed.

The Food Quality Protection Act, as interpreted by the EPA, has changed that. Go back to that farmer. We are all exposed to some level of pesticides in our daily lives. The food we eat, our homes, yards, gardens . . . everything has some *chance* of having been exposed to minute quantities of some pesticide, somewhere, sometime.

The EPA now assumes that we all are exposed to the maximum level of all of these chemicals. But wait. Chemicals, pest control chemicals are derived from only a few major chemical families. Organophosphates, Carbamates, pyrethroids and the like. The EPA now groups all chemicals from a family, organophosphates say, into a lump, puts a ceiling on how much we can be exposed to in all situations forever, and allows no more.

Thus, if they decide (and they have) that there are enough or even more than enough organophosphates (OPs) used in the environment for all uses, the OP cup is full, so to speak, and until some old OP is taken away, no new OPs can be registered. Some deem this over protection, bordering on the fanatical. Others claim that even this is not enough, and the total limits should be lowered further still, to protect, especially, children. Moreover, the argument goes, if you do not agree, you certainly must be *against* children. That may be neither logical nor even true, but it's a tough argument to win. It's sorta like the old "When did you quit beating your wife?" situation. It's no win, no matter what.

Back to Bayer. Their new *Varroa* control is, of course, an OP. One that's been around over 40 years, is used very little in the real sense, and the opportunity of exposure by almost everybody is essentially zero. By the old rules it would be a cinch to get registered. By the new rules there's (probably) not a chance. At least until some of the old OPs go

Continued on Page 62

D.C., EPA, & FQPA . . .

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Bee Culture

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MAILBOX

Congrats To Richard

I just have to comment on Richard Taylor's "Bee Talk" in the March '98 issue of *Bee Culture*. Congratulations, this is one of the only articles written on AFB that makes any sense. Why do bee inspectors say to burn hives infected with AFB? Every hive in North America has AFB spores.

Let me offer a scenario. Only larva get AFB. We treat the hives so they don't get AFB. Common sense tells you that the AFB hasn't left the hive after you stop treating the larva, as when the honey flow starts. So why don't the larva start getting the AFB when you stop treating? If you are feeding them "contaminated honey," they should start getting AFB the minute you stop the treatment, but they don't. The key is in the overall condition of the hive's health.

I do not advocate this for others but this is what I do. First, I never treat any hives until I see signs of AFB. Why? Because, as I stated above, if it was that easy to get AFB then the bees would get it the minute you take off the medications. Second, the more you use a medicine the more likely the AFB will build up a tolerance to it and it will become ineffective, just as doctors are finding that some antibiotics are becoming ineffective.

Last Fall, for the very first time, I got a hive with AFB. Why? During April, they had become queenless. I didn't notice this until May as they started getting weaker because I don't like to go into the brood area anymore than needed during the honey-flow. I requeened and they were fine. Then, even though I treat for mites twice a year, the mites started weakening them before I got the Apistan strips in, in late July. Then, they started getting AFB. As the honey flow ended the other hives started robbing this hive. Now obviously, the honey they stole was contaminated with AFB spores, yet no other hive got AFB.

I threw away the two frames of brood that were contaminated, scorched the inside of all woodenware except the frames, then dipped the frames and comb in denatured alcohol, making sure it gets into the comb. I am going to start a new hive with this woodenware this Spring. If AFB "get's um," I'll let you know.

Frank Chamberlin
Asheboro, NC

Address Needed

Thanks for printing my request to the NHB assessment paying beekeepers in the April issue of *Bee Culture*. Unfortunately you failed to give them my address! This is a rather significant component of the request. If you could rectify this inadvertent omission at the earliest time possible I would appreciate it.

Joe Rowland
2495 Montrose Turnpike
Owego, NY 13827
Ph. (607) 687-2679

J.B. the Bee Man

For as far back as I can remember, everyone in my hometown of Statesville, NC has known my dad as the "Bee Man." When I was a kid I recall lots of people in my neighborhood gathering in our backyard every time my dad "robbed the bees." They were amazed at how he could just stand there so calm with all those bees swarming around him. Even with a veil and protective clothing it still seemed like an incredible feat.

At one time, my dad had a glass observation hive set up in our basement. Let me tell you, this really drew a crowd, especially the local children. We were all thrilled to be able to look at the bees fly in and out of the hive and watch what they did once they were inside.

I always thought it quite ironic that although my dad loved to work with bees, he never really liked honey. After he went through all the work of robbing the bees and extracting the golden nectar from the comb, he usually gave it away to friends and neighbors.

My dad's full name was Jay Broddus Elam. When it comes to genuine bee lovers, my dad has to rank right there at the top. I would like to dedicate this to my father, "J.B. the Bee Man," the bee's best friend who passed away November 17, 1997.

Gary S. Elam
Statesville, NC

Queens - Queen Cups

I have trouble accepting Clarence Collison's contention that queens lay eggs in queen cups (March '98 *Bee Culture*, p. 52).

In the first place, queen larvae are made by nurse bees, not by queens. Queens never lay fertilized eggs in drone cells so why should we expect them to lay such in the even larger queen cups? Why would a queen lay an egg in a cup intended to supercede herself?

More important, how do we know how an egg gets into a queen cup? (Or how do we know that a queen cell ever is started in a queen cup?) I have cut queen cells in which the larva is still in a horizontal position, not yet having moved into the vertical.) Clarence points out that worker bees do move eggs. So how do we know which eggs which later are reared into queens were located by workers and which by queens?

Someone would have to see those eggs being placed. And not just a few but enough to support the designation "most." I have never read a report of such sighting nor even a citation of such a report.

Contined on Next Page

MAILBOX

As Mark Winston would say, "How do we know that?"

Dan Hendricks
Mercer Island, WA

Disappointed!

My renewal notice could not have come with a more appropriate issue. (*BC* March 98). Appropriate because I have been dissatisfied with your policy of not reporting the ongoing research in alternative methods of *Varroa* mite control, i.e. the use of essential oils.

Due to reports of fluvalinate resistant mites your policy of refusing to look at alternatives to Apistan is about to change whether you like it or not. I find it interesting that Wellmark International is pointing fingers at beekeepers for *Varroa* tolerance. Could it be that minute traces of this chemical remain in the hive and wax and that over time mites become resistant even if the product is used exactly as prescribed? Do you think that Wellmark or EPA would admit this if it is true? Will you continue your stance and berate the beekeeping community for this problem?

Regardless of what the makers of Apistan write in their advertisements, there are other ways besides use of their products to protect hives from mites. They simply don't have a patent on those methods and don't want beekeepers to know about them. I have never used Apistan in my hives, but have relied completely on the use of essential oils and the research that is being done on this method of control at West Virginia University. Yes I have *Varroa* in my hives, but it is under control and my bees made it through the Winter and are looking strong . . . just like last year.

In conclusion, I have enjoyed your magazine for the past two years. Unfortunately I can only afford to subscribe to one magazine and feel that the "other" American publication is closer to the cutting edge of beekeeping.

Michael Hubbard
Wilmington, NC

Editor's Note: *You bring up some interesting points. I, too, have followed the studies from West Virginia with interest. Unlike you, however, I have followed other studies on essential oils performed at MN, AZ, OH and NY. Are you aware of these? All of these, WV included, demonstrate some efficacy in controlling mites. None, repeat none are as good, as efficient or as economical as Apistan. Nor, have the WV studies indicated residue analysis in wax or honey (at least to my knowledge), while the others have proven that residue exists, and that it may be harmful.*

I'm sorry you won't be reading this, but perhaps some of the other essential oil users will. Be careful out there.

Case For Apistan

Not long ago, at a local bee meeting, a side discussion about the use of a form of Fluvalinate, the principle ingredient in Apistan, arose. At the end of the discussion one of the beekeepers remarked "you do what you have to do to keep your bees alive" inferring it was O.K. to use this chemical to kill *Varroa* mites.

Fluvalinate is not soluble in water, hence it is partially liquefied in a highly volatile chemical which helps emulsify it when diluted in water and applied as an agricultural spray.

When illegally used in beehives its immediate effect is devastating to any *Varroa* clinging to the adult bees. At first glance this seems to be an effective control method and is probably, in the short run, cost effective.

The catch is, used in this manner, the highly volatile, chemical is readily absorbed into both beeswax and honey. Also its volatility is short lived and does not affect young and reproducing mites that are in capped brood cells. The long range effects are, it requires repeated doses over short time periods. Beekeepers, let's try not to second guess a tried, acceptable and proven control method. Keep using the Apistan strips until another acceptable method is put on the market!

Bob Cory
Dunkirk, MD

It's Out There

I have a question for Mark Winston concerning his longing for more apicultural extension (March '98 *Bee Culture*, p. 17). Has he ever read anything in an extension bulletin (and maybe even heard anything from an extension agent) which would be news to anyone who has read either *The Hive and the Honeybee* or *ABC and XYZ* of *Bee Culture* and subscribed for the last five years to both *Bee Culture* and *The American Bee Journal*?

I think all the information is out there. A time or two I have asked for a show of hands at our bee club meeting to see who subscribed to both of those magazines and have been amazed, and distressed, at how few hands went up. In my opinion, that is where the problem lies.

Dan Hendricks
Mercer Island, WA

Request For Labels

It has been about 15 years since I made a collection of labels beekeepers use on their honey and hive products. It's about time I updated this collection which is used for display at bee meetings and when giving marketing presentations. Can you send me one of your labels? I would really appreciate it.

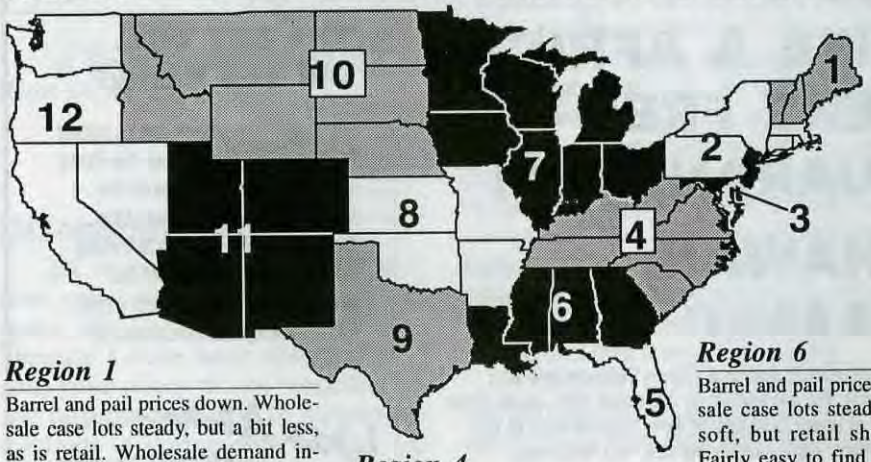
Ann Harman
1214 North Poes Rd.
Flint Hills, VA 22627

Light - & Not A Train!

Please keep publishing your wonderful magazine. It is a light at the end of the tunnel for a sideliner like me and it's not an oncoming train. I make good use of the information, and I like the way the Editor puts his words together. I am able to understand what he is talking about.

Jack Tewinkle
Central AZ

MAY – REGIONAL HONEY PRICE REPORT



Region 1

Barrel and pail prices down. Wholesale case lots steady, but a bit less, as is retail. Wholesale demand increasing, but only slightly, bulk prices soft in weak market. Season sales outlook optimistic, colonies in good shape.

Region 2

Barrel and pail prices down. Case and retail falling but only slightly. Bulk demand weak with lots available, retail demand soft, but steady. Outlook mostly optimistic for steady to strong sales for '98.

Region 3

Prices steady at all levels, but demand for bulk strong at low prices. Wholesale and retail demand strong but price steady. Outlook strong for sales in season.

Region 4

Prices for bulk and pail dropping, but wholesale case and retail shelf prices increasing. Producers finding buyers, at any price increasingly difficult, but buyers also having some difficulty finding local honey. Market looks good for '98.

Region 5

Prices down across the board – bulk in barrels and pails, wholesale case lots and retail shelf. New crop citrus may halt that once available. Bulk easily obtained, but difficult to get 'realistic' price for. Producers mildly optimistic about price growth in '98.

Region 6

Barrel and pail prices down, wholesale case lots steady, but demand soft, but retail shelf prices up. Fairly easy to find honey, moderately hard to sell at good price. Seasonal market expectations mixed.

Region 7

Bulk and pail prices down, wholesale cases steady but demand only steady to soft, and retail store price steady to increasing just a tiny bit. Buying honey bulk fairly easy, selling bulk difficult at needed price. Outlook for '98 market moderately discouraging.

Region 8

Bulk and pail prices down, wholesale case prices down and retail store prices only steady and soft. Bulk honey easy to get, and easy to sell, but prices not encouraging. Producers optimistic for '98 market season.

Region 9

Barrel and pail prices down, but only slightly, while wholesale cases and retail shelf prices steady but strong demand. Bulk honey readily available, but few buyers, but '98 outlook still optimistic.

Region 10

Bulk and pail prices slowly decreasing, but steep drop has stopped. Wholesale and retail steady, with demand for both steady. Not many buyers located in region, but selling bulk anywhere a chore. Outlook mixed for '98 crop, and market.

Region 11

Barrel and pail prices still dropping, wholesale case prices still dropping, but retail holding on. Demand for bulk increasing a bit, but supply slow to fill orders due to price. Season outlook guarded.

Region 12

Barrel and pail prices eroding, wholesale cases steady and retail steady, with demand strong and steady. Honey buyers generally have lots available, and even with lowered prices sales strong. Generally optimistic for '98 marketing season.

	Reporting Regions												Summary		History	
	1	2	3	4	5	6	7	8	9	10	11	12	Range	Avg.	Last Month	Last Yr.
Extracted honey sold bulk to Packers or Processors																
Wholesale Bulk																
60# Light	58.11	63.20	48.00	66.50	60.92	51.50	52.44	60.92	54.00	63.00	71.67	57.96	42.00-81.00	59.76	63.15	68.57
60# Amber	54.32	56.99	50.40	57.80	54.58	53.67	49.94	59.50	52.00	63.00	60.50	51.80	33.00-75.00	55.73	59.29	64.06
55 gal. Light	0.70	0.80	0.72	0.70	0.62	0.66	0.67	0.72	3.75	0.71	0.78	0.79	0.68-1.25	0.72	0.84	0.97
55 gal. Amber	0.65	0.75	0.67	0.64	0.61	0.61	0.65	0.65	0.66	0.73	0.70	0.70	0.55-1.20	0.66	0.79	0.91
Wholesale - Case Lots																
1/2# 24's	28.27	26.39	30.13	32.07	22.30	32.00	28.53	30.13	30.00	30.13	27.75	31.53	19.20-42.00	29.18	29.41	30.16
1# 24's	41.72	39.99	43.20	43.13	36.00	41.50	41.64	39.36	48.00	44.00	42.65	45.43	30.00-60.00	42.49	43.64	42.23
2# 12's	37.49	36.35	40.20	42.58	33.60	38.30	37.50	39.80	40.00	41.00	33.80	36.13	28.50-52.58	38.31	39.49	37.35
12 oz. Plas. 24's	35.10	36.14	40.80	38.85	31.00	27.20	34.58	35.28	35.00	40.80	39.13	34.36	32.80-50.00	35.99	37.09	36.03
5# 6's	39.63	42.59	46.50	42.67	42.55	41.04	38.35	39.00	45.00	41.25	34.78	36.38	31.50-56.25	42.02	41.90	38.90
Retail Honey Prices																
1/2#	1.79	1.55	2.83	2.17	1.15	1.82	1.86	1.89	2.15	2.83	2.53	1.76	1.09-3.20	1.82	1.84	1.78
12 oz. Plastic	2.22	2.39	2.25	2.26	1.84	2.20	2.02	2.45	2.62	2.25	2.70	2.11	1.59-3.29	2.26	2.23	2.21
1 lb. Glass	2.67	2.75	2.50	2.78	1.99	2.64	2.54	2.90	2.96	2.37	3.32	2.75	1.99-4.29	2.70	2.68	2.68
2 lb. Glass	4.32	4.41	4.50	4.79	3.59	4.16	4.32	4.56	4.37	4.62	4.81	4.22	2.89-6.00	4.40	4.53	4.42
3 lb. Glass	6.00	6.91	6.50	6.31	5.76	6.18	6.15	6.10	6.25	5.49	6.52	5.58	4.50-9.00	6.14	6.32	5.93
4 lb. Glass	7.57	7.55	8.14	7.81	8.14	6.95	9.25	7.91	7.65	8.50	8.14	6.00	6.00-10.50	7.91	7.68	7.13
5 lb. Glass	9.21	9.83	9.75	9.50	7.50	8.50	9.86	9.09	9.95	8.46	9.38	8.33	7.25-14.00	9.38	9.48	8.63
1# Cream	3.12	3.18	3.70	3.48	3.70	3.38	2.70	3.44	4.75	3.76	3.49	2.74	2.19-5.75	3.17	3.24	3.24
1# Comb	4.01	4.15	4.04	4.05	4.04	4.25	3.72	3.69	6.00	4.04	4.73	4.40	1.95-6.00	4.16	4.15	4.20
Round Plastic	3.57	3.23	3.50	3.83	4.06	4.00	3.88	3.59	6.00	4.06	4.25	4.25	2.50-6.00	3.67	3.59	3.85
Wax (Light)	1.83	2.60	2.10	2.09	2.00	1.55	1.81	1.45	3.55	2.91	1.40	1.43	1.40-7.50	1.82	2.58	2.90
Wax (Dark)	1.51	2.10	2.00	2.06	1.75	1.34	1.56	1.05	1.50	1.42	1.41	1.21	1.25-6.50	1.50	2.23	2.58
Poll. Fee/Col.	37.43	40.56	35.00	40.67	32.50	37.33	39.29	39.00	15.00	37.78	50.00	34.71	15.00-60.00	38.34	37.54	35.00

Select Beekeeping Industry Statistics

	HONEY PRODUCING COLONIES					YIELD PER COLONY					AVG PRICE PER LB				
	1993	1994	1995	1996	1997	1993	1994	1995	1996	1997	1993	1994	1995	1996	1997
STATE	x1,000					LBS					CENTS/LB				
AL	19	18	16	16	14	45	50	58	64	66	59	50	62	86	81
AZ	55	47	52	32	32	77	59	79	60	80	52	51	68	84	72
AR	50	50	50	40	40	73	71	60	84	95	50	48	64	87	70
CA	500	400	420	390	400	90	60	93	70	75	50	50	60	84	70
CO	53	45	45	30	35	73	76	60	74	55	58	57	68	79	82
FL	200	230	230	240	240	113	84	86	105	67	50	46	63	91	73
GA	80	80	70	75	75	56	63	62	68	46	61	58	69	89	79
HI	9	11	8	8	9	177	100	129	155	146	52	50	55	80	86
ID	133	127	125	110	120	71	59	48	45	64	52	50	65	90	72
IL	15	13	11	11	7	48	80	74	74	69	96	105	102	130	127
IN	12	13	12	9	8	66	54	63	75	71	70	83	68	107	113
IA	60	55	50	58	51	49	66	68	67	74	56	69	72	98	86
KS	23	19	17	16	17	57	47	67	51	71	56	64	71	96	81
KY	4	3	3	3	3	60	54	44	60	60	84	101	103	127	148
LA	47	35	33	37	38	86	98	119	106	115	52	46	61	84	70
ME	13	8	11	10	8	50	55	45	23	19	68	61	100	126	70
MD	7	7	7	7	6	27	36	35	32	40	147	98	114	111	159
MI	90	90	97	90	85	77	86	92	96	70	57	56	72	110	77
MN	180	170	165	150	145	80	79	82	77	73	53	52	66	91	74
MS	17	19	16	17	19	61	53	70	80	73	49	47	64	85	73
MO	24	25	23	22	24	73	77	67	74	77	59	52	65	92	78
MT	95	119	106	117	107	98	105	80	60	120	54	51	66	88	74
NE	83	72	60	65	61	70	55	73	75	67	53	52	68	92	77
NV	14	14	9	14	14	52	54	29	61	61	95	93	96	105	114
NJ	9	9	8	5	8	28	33	34	45	49	87	62	71	106	104
NM	18	19	19	15	15	64	64	65	77	60	68	47	68	94	87
NY	65	68	70	68	72	62	68	75	80	60	63	65	66	88	85
NC	15	15	12	12	8	53	59	52	44	58	90	97	81	106	119
ND	220	235	220	230	245	90	138	108	86	100	52	46	63	90	74
OH	30	27	25	24	22	66	64	62	70	80	66	59	72	98	85
OK	6	5	5	4	4	67	58	76	59	58	81	88	91	107	137
OR	53	50	52	55	47	67	65	52	59	53	56	53	71	92	79
PA	28	27	25	23	22	40	47	43	46	48	64	58	69	99	100
SC	11	10	9	9	-	90	100	90	90	-	60	82	125	113	-
SD	245	260	240	240	240	98	100	85	97	65	52	51	65	91	74
TN	8	6	4	5	6	51	51	53	64	62	93	97	114	137	147
TX	105	103	84	82	94	82	4	106	83	106	51	49	64	87	75
UT	42	43	32	34	32	53	59	33	46	52	55	54	61	85	75
VT	6	5	5	4	5	82	77	67	83	63	67	70	83	108	83
VA	10	11	9	7	8	54	52	45	50	53	81	64	55	136	145
WA	60	60	60	57	54	45	62	59	58	52	61	54	54	89	76
WV	20	20	13	10	8	37	44	41	59	70	111	114	116	169	111
WI	100	75	73	69	79	82	71	79	78	60	59	55	71	83	90
WY	34	46	38	40	38	55	69	36	73	62	53	53	68	91	75
TOTALS	5861	5758	5634	5556	5562	-	-	-	-	-	-	-	-	-	-
AVG.	-	-	-	-	-	76.8	74.5	75.5	79.1	76.0	74.4	72.0	84.4	112.3	100.7

From USDA NASS

Unlike most sources of information in this industry, when we receive some new set of data we try and make some sense of it by presenting a bigger picture. Obviously, looking at simply the number of colonies used this year, according to the U.S.D.A.'s figures, tells a story. You can compare your state to all others.

But how does this compare to last year? Or four years ago? What has been the trend in the U.S. Or in your state.

How does yield/colony affect price? Over time? And does either yield or price affect number of colonies over time?

Only by looking at trends over time, and across regions and states can you form a more complete picture of this industry.

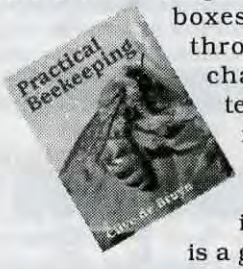
Beeswax, too, overtime is affected by the trends in honey production, and certainly price. Domestic production tends to follow honey production, but increased demand increases imports.

Beeswax Imports, 1000lbs.				
1993	1994	1995	1996	1997
1,877	2,196	3,007	4,866	3,280

NEW

Practical Beekeeping. Clive de Bruyn. Published by Crowood Press, distributed by Trafalgar Square, North Pomfret, VT 05053. (800) 423-4525. Hard cover, 288 pgs. Color and B&W. $50.00

Probably the best book on beekeeping out of the UK I've seen, relative to the way we do things in this country. Good information, lots of diagrams and photos and some incredible color shots of bees on flowers. Unique is the highlight boxes scattered throughout each chapter defining terms or summarizing an important concept. Pricey because it's imported, it is a good book.



Kim Flottum

DSB Comb Honey Unit

Elsewhere in this issue there is a short article on a comb honey unit using tiny, tiny sections, made from modified frames. It is a good way to try comb honey. But if you're like me, without the time and resources to build a unit like that, Draper's Super Bee, in Auburn, NE has one all made up. Almost anyway. You have to assemble the frames but you only use support pins for the foundation. Each super holds 30 of these little frames, and, when harvested, the complete frame and comb honey fit in a small plastic box available from the manufacturer for sale. Each frame retails for $5 - $10 each, so even a half filled super the first year would gross out at $75 to $300 sales. More than enough to pay the $50 plus shipping costs. Call them at (402) 274-3725 or write: Drapers, 914 "S" St., Auburn, NE 68301.

Kim Flottum

Instrumental Insemination Instruction. English and Spanish versions of VHS video. 25 minutes. $59.95 postpaid in U.S. Order from Sue Cobey, Ohio State University, 1735 Neil Ave., Columbus, OH 43210-1220.

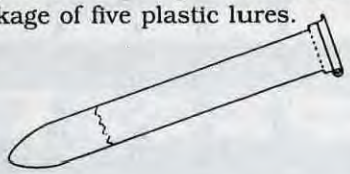
An excellent video of instrumental insemination of honey bee queens that is practical and covers the essential details of the operation has been produced by Sue Cobey, Department of Entomology, Ohio State University. This is a teaching video that is suitable for self-learning or as an adjunct to lecture and to demonstration. Sue is an expert honey bee queen inseminator and a competent instructor, and as this video opens she puts the students at ease by visiting the Rothenbuhler Honey Bee Laboratory apiary prior to entering the laboratory building. The student is then introduced to various insemination devices that are used, or have been used in the past, where some familiarity with the instruments is gained.

This video teaches visually and verbally by demonstration and explanation of each maneuver as it is performed by the instructor. The student views from the instructors' side or through the microscope as the insemination progresses, which creates a feeling that the student is performing the operation. Cleanliness and care are emphasized, especially in sperm handling. Possible difficulties are listed in appropriate places.

This video is so interesting, and makes it so easy to visualize the process of insemination that it should encourage beekeepers with a scientific bent to use instrumental insemination for maintaining or improving characteristics of their bees, including temper and resistance to disease and parasites. Instrumental insemination is integral to any carefully planned bee breeding program but is no longer the exclusive breeding tool of the scientist.

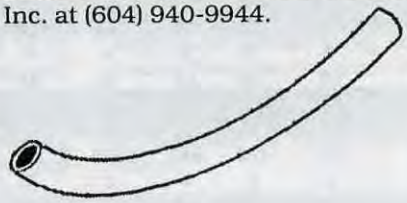
Harry Laidlaw

Phero Tech Inc. has two products available for beekeepers. *Swarm Catch* is a synthetically produced nasonov pheromone used in conjunction with bait traps for swarms. The manufacturer suggests you can also use these lures to trap nuisance bees around homes, attract bees to water resources, in greenhouse pollination units and to increase pollen consumption, and brood production in the Spring. It comes in a package of five plastic lures.



Bee Boost contains Queen Mandibular Pheromone and has a variety of uses. It can be used to hold queenless nucs for several days, or even queenless colonies until requeened. Also, to capture lost bees after a move or when a swarm is taken away, and in conjunction with Swarm Catch to lure swarms to a trap.

For more information, or a list of sales outlets, contact Phero Tech, Inc. at (604) 940-9944.



Queen Rearing and Bee Breeding by Harry H. Laidlaw Jr. and Robert E. Page Jr., Wicwas Press, Cheshire, Connecticut 1997, 224 pages.

This book is a new edition of earlier versions last published in 1962 (*Queen Rearing* by Laidlaw and Eckert) and 1979 (*Contemporary Queen Rearing* by Laidlaw), and it is a most worthy successor. The authors of the current edition, Harry Laidlaw and Rob Page, are both titans in the area of queen biology and management, Laidlaw for his pioneering work on queen rearing and instrumental insemination and Page for his equally significant work on honey bee genetics and breeding, including mating designs. They have joined forces to produce an instant classic, blending new information with the stan-

dard practices described in past books to produce an interesting, informative, and necessary book for every beekeeper's shelf.

The most noticeable aspect of *Queen Rearing and Bee Breeding* is the breadth of material the authors cover. The reader can find a wealth of practical, hands-on tips for anything related to queens, from how to judge a queen's quality to setting up and maintaining cell building colonies, minute details of how to make a grafting needle to a range of queen introduction methods, complex mating systems for commercial bee breeders to simple designs for the beginning hobbyist. Laidlaw and Page go much further, however, and provide important background information crucial to the success of queen management, including sections on sex determination, breeding and selection criteria, causes of inbreeding and methods to reduce it, a discussion of hybrid vigor, and ideas for how to select for disease resistance.

The book is not only well-written, but well-illustrated as well. There are photographs or figures of every important piece of equipment, technique, or concept that might be used to manage queens, including types of queen cages, organization of rearing and mating yards, cell dipping procedures, queen anatomy, insemination equipment, and much, much more. And, this book is fun; they conclude with a whimsical poem written by Laidlaw that alone is worth the price of the book.

The back cover proclaims "Written for beekeepers who know little about genetics and geneticists who know little about beekeeping," and that's a fine summary of this excellent book. If you were about to be abandoned on a desert island with nothing but a colony of bees, a hive tool, a smoker, and three books, this should be one of your books.

Mark Winston

Roger Morse

Research Review

"It has been suggested that the introduction of honey bees into areas where they are not native has upset the local ecology."

Honey bees from Europe, Africa and the near east, especially Europe, have been introduced into nearly every country on earth. It has been suggested by some conservationists that the introduction of these bees into areas where they are not native has upset the local ecology. Further, some biologists have advised that honey bees should be excluded "from conservation areas intended for native bees." Another paper states honey bees are poor pollinators because they do not pollinate some plants as well as they do others. Other authors have stated honey bees "must" have a negative effect on native bee populations just because they are introduced. The paper I review below does an excellent job of debunking these thoughts. Documented cases of honey bees eliminating other bee species through competition do not exist. No one has documented that honey bees have an adverse effect on the ecology.

Competition

It is found that honey bees tend to use only a small percentage of the flowering plants available to them in the areas where they have been introduced. In one study in Jamaica, it was found that honey bees foraged on only 20 of the 107 native flowering species. In Trinidad, pollen loads were found to contain pollen from 44 different plant species but only 10 of these were used extensively by honey bees. Several examples are cited from other countries. The author writes, "In summary, honey bees often use less than a third of the available flowering species," which leaves a great number of plants for other bee species.

As an example of extreme thinking without data, Charles Darwin, author of the *Origin of Species* wrote in 1872, "In Australia the imported hive-bee is rapidly exterminating the small, stingless native bee." This statement has proven to be false and in a section devoted to the effects the introduced bees on native populations of other bee species it is pointed out honey bees and the stingless bees are both thriving even when they forage on the same plants and live side by side.

Studies have been made in Central America and Australia to determine if honey bees reduced populations of native bees or threatened them with extinction. There is considerable plant resource overlap between honey bees and several other bee species. One of these studies has spanned 17 years. "No evidence of deleterious effects" was found.

Do honey bees help weeds?

"Do honey bees promote weed success and abundance?" This question has been asked too. Other factors appear to be more important according to this researcher. Things such as disturbed environments, a lack of native pests and predators, specialized methods of dispersal, and variability from normal in reproduction are also big factors in expanding weed populations. Honey bees may contribute to the success of some self incompatible weeds but the number appears to be small. Hard data are difficult to find in this area of study but it is pointed out that native pollinators would probably have done just as good a job of pollinating weeds if honey bees had not been present. There may be exceptions as honey bees increases the seed set in star thistle and they are important pollinators of purple loosestrife. Both of these plants have been marked by government agencies for control or elimination.

Effect on nest sites?

It has been claimed that honey bees may occupy hollow trees in areas where these same sites may be important for certain birds and animals such as squirrels. Studies have not been made in this country but in Australia and New Zealand, where observations have been made, it has been found that predation from other animals appears to be more important in limiting populations of these animals.

Displacing native insects?

It is pointed out that at the same time honey bees were introduced into most areas, land was cleared for crops making measurement of the effect of honey bees nearly impossible. It has been other "human activities" that have been the primary cause of there being a list of endangered plant and animal species.

My comments and opinion

I obviously like the paper I cite below. The success of modern agriculture in the United States is due in part to the use of an estimated 1.2 million colonies of honey bees for the commercial pollination of crops. Most of these colonies are used to pollinate two to three agricultural crops, mostly in the Spring of the year. Two solitary bee species are also used for commercial pollination but to a very small extent. The ease with which honey bees are moved, and their colony populations measured, makes them the pollinating insect of choice.

It is important to take environmental concerns into consideration and to do what we can to maintain a diversity of species on earth. However, there are people to feed and human populations are growing. While that may not be good for all concerned it is a fact that we must live with. I like modern agriculture and the fact that people are well-fed in this country. BC

References:

Butz Huryn, V.M. *Ecological impacts of introduced honey bees.* The Quarterly Review of Biology 72: 275-297. 1997.

?DO YOU KNOW?

Honey Plants & Honey Flows

Clarence Collison
Mississippi State University

Colony development and productivity are indirectly related to local weather patterns as well as major and minor floral sources in the immediate area of the apiary. Major honey flows depend on a few plant species which yield nectar abundantly and are readily available. Large acreages of flowers are needed to produce surplus honey. Besides the two or three main annual sources, there should be a great variety of minor plants yielding both nectar and pollen throughout the season to support the colonies between the main flows.

There are three key components to honey production: 1) colony strength; 2) weather conditions conducive to flowering, pollen release, nectar secretion and foraging; and 3) abundant floral sources. It is important for the beekeeper to know what plants are in the area, when they bloom, whether they supply both nectar and pollen and how abundant and dependable they are from year to year. This information is of value in timing colony development and anticipating management problems.

Please take a few minutes and answer the following questions to find out how well you understand the factors that affect nectar and pollen production.

The first nine questions are true or false. Place a T in front of the statement if entirely true and F if any part of the statement is incorrect. (Each question is worth 1 point).

1. ___ Within the plant, nectar is derived primarily from phloem sap.
2. ___ Nectaries are centers of intense metabolic activity.
3. ___ Relative humidity has a direct effect on nectar secretion.
4. ___ Nectaries are glands that are specialized for the export of sugars.
5. ___ Bee visits and pollination enhance nectar secretion.
6. ___ The time of day at which pollen is released is a species characteristic and is impacted by temperature.
7. ___ Wind-pollinated flowers produce a greater abundance of pollen than those pollinated by bees.
8. ___ Both male and female flowers produce nectar and pollen.
9. ___ The ratio of phloem to xylem tissue to the nectary appears to determine the concentration of the nectar as it is secreted.

Multiple Choice Questions (1 point each).

10. ___ The environmental factor that has the greatest impact on nectar secretion is:
    A. Temperature
    B. Wind Speed
    C. Soil Moisture
    D. Relative Humidity
    E. Solar Radiation or Sunlight
11. ___ The sugars found in nectar are derived from the biological process known as:
    A. Transpiration
    B. Photosynthesis
    C. Metabolism
    D. Respiration
    E. Translocation
12. Define anthesis and dehiscence in relation to pollen production in a flower. (2 points).
13. The outer layer or exine of a pollen grain serves what primary function ? (1 point).
14. Plants that secrete nectar during the night are likely to be pollinated by _____. (1 point)
15. Name two effects that wet, rainy weather have on nectar supplies in flowers. (2 points)
16. What are the three primary sugars found in nectar and which one is most attractive to honey bees. (4 points)
17. While pollen is being packed in cells by worker honey bees, chemicals are added to the pollen for what three reasons? (3 points)
18. Define nectar dearth. (1 point)

ANSWERS ON PAGE 54

WATCH OUT! Pesticides Can Be Hazardous To Bees, Too!

Original Data From U.C. Davis, 1972; updated 1981 and 1997. This list is not all inclusive and new, or seldom used materials may not be included. Check with applicators, extension offices or growers to positively ID a chemical *before* application.

Group 1 – Highly Toxic – Severe losses may be expected if the following materials are used when bees are present at treatment time or within a few days thereafter, except as indicated by footnotes.

Aldrin[2]
admire,
ammo
Arsenicals[2],
Ambush
asana
Azodrin®
(crotonamide)[2]
Baygon®
Baytex®
(fenthion)
Baythroid
BHC[2]
Bidrin®[2] (dicrotophos)
Bux® (RE-5353)
Capture
Chlorthion®
Cygon®, DE-FEND®
(dimethoate)[2]
Danitol
Dasanit® (fensulfothion)
DDVP (dichlorvos)
Decis
Diazinon[2]
Dibrom® (naled)[2 3]
Dieldrin[2]
Dimecron®
(phosphamidon)[2]
Dursban®[2]
Ekamet
EPN[2]
Ethyl Guthion®
(azinphosethyl)[2]
Famophos®
(famphur)
Folithion
Furadan®[2]
Gardona®[2]
Guthion®
(azinphosmethyl)[2]
heptachlor[2]
Imidan®
Lannate® (Nudrin)
(methomyl)[2]
lindane[2]
Lorsban
malathion[2 4] (cythion)
Matacil®
Mesurol®
Metacide®
methyl parathion[2]
Methyl Trithion®
Mobam®
Monitor®[2]
Mustang
Orthene
Parathion[2]
Penncap-M
Phosdrin®
(mevinphos)[2 3]
Pounce
Pydrin
Sevin®
(carbaryl)[2]
Sumithion®
Supracide
Temik®
(aldicarb)[2 7]
TEPP[2 3]
Vapona
zectran®[2]
Zinophos®

Group 2 – Moderately Toxic. These can be used around bees if dosage, timing, and method of application are correct, but should not be applied directly on bees in the *field or at the colonies.*

Abar®[2]
Abate®[2]
Biothion®
Agritox®
Banol®
Bolstar
Carzol® (formetanate)[2]
chlordane[2]
Ciodrin®
Counter
Co-Ral® (coumaphos)
DDT[2]
Curacron
Croneton
Di-Syston® (disulfoton)[6]
Dyfonate
endothion
endrin[2]
Korlan® (ronnel)
Larvin
Meta Systox®
(methyl demeton)
Meta-Systax R®
(oxydemetonmethyl)
mirex
Mocap
Perthane®[2]
Phosalone®
Phosvel®
Pounce
Pyramat®
Sevin XLR
Systox® (demeton)[2]
Scout
Tartar emetic
Thimet® (phorate)[2 6]
Thiodan®
(endosulfan)[2]
Trithion®
Vydate
(carbophenothion)[2]
Zephyr
Zolone

Group 3 – Relatively Nontoxic. These can be used around bees with a minimum of injury. Herbicides and fungicides not included in this list.

INSECTICIDES
Acaraben®
(chlorobenzilate)
allethrin
Altosid
Aramite®
Baam
Birlane
Bacillus thuringiensis
Cryolite[2]
comite
Delnav® (dioxathion)[2]
Dessin®
Dilan®[2]
Dimite® (DMC)
DNOCHP
(dinitrocyclohexyphenol)
Dylax® (trichlorfon)[2]
Eradex®
Ethion[2]
Fundal®
Galecron®
(chlorophenamidine)
Heliothis virus
Kelthane® (dicofol)[2]
Kepone®
Mavrik®
Methoxychlor[2]
Mitox®
(chlorbenside)
Morestan®
Morocide® (binapacryl)
Murvesco® (fenson)
Nemagon®[2]
Neotran®[2]
Nicotine[2]
Omite®
OMPA (schradan)
Ovotran® (ovex)[2]
Pentac®
Phostex®
Pyrethrin
Rotenone[2]
ryania[2]
sabadilla[2 5]
Saphos® (menazon)
Strobane®
Sulphenone®
Tedion® (tetradifon)
Toxaphene[2], Tetram
Zardex

[2]These materials, in addition to having been laboratory tested, have been field tested mainly on seed alfalfa or cotton, citrus, ladino clover, milo, and sweet corn. All others were laboratory tested only. Further field testing may change the group location of some of these materials.
[3]Dibrom®, Phosdrin®, and TEPP have such short residual activity that they kill only bees contacted at treatment time or shortly thereafter. These materials, usually safe to use when bees are not in flight, are not safe to use around colonies.
[4]Malathion has been used on thousands of acres of blooming alfalfa without serious loss of bees. However, occasional heavy losses have occurred, particularly under high temperature conditions. If applied to alfalfa in bloom, it should be only as a spray, and treatment should be made during the night or early in the morning when bees are not foraging in the field. Do not use undiluted technical malathion spray around bees.
[5]Sabadilla, when used as a 20 percent dust, may cause bee losses.
[6]Di-Syston® and other systemics used as seed treatments have not caused bee losses.
[7]Temik®, although highly toxic to bees as a contact poison, is used only in granular form and extensive field usage has not resulted in bee losses.

Mark Winston

A Sense Of Occasion

"Our collective failure to mark events with a sense of occasion is glaringly apparent in the beekeeping community, and perhaps provides an explanation for why some meetings are fantastic while others are eminently forgettable."

I spent this last New Year's Eve at a typical party of the '90s, at least typical for people of my age. There was lots of food, piles of kids in the basement watching a nonviolent and politically correct video, as much dancing to the hits of the '60s as middle-aged dancers with bad backs and sore knees could do, and plenty of mineral water to drink. New Year's Eve parties are fun in the same way that weddings are fun, by bringing together diverse friends of the host who don't know each other and mixing them into a party. Somehow it usually works, with the occasion providing a good excuse to mingle, learn each other's stories, and reminisce about how things used to be in the olden days.

I spent some time at this party talking with the principal of a local school, and we soon arrived at the predictable subject of "what's wrong with kids today." Her view on this subject was not what I expected, however. We went through the usual laments about drugs, teenage sex, too much television, overworked parents and latchkey kids, etc., but then she remarked that these problems were only symptomatic. The worst problem that she observed in schools was that kids had lost their sense of occasion. That is, kids were not aware of the difference between, say, a pep rally and an assembly for Remembrance Day (the equivalent of Veterans Day in the United States). Their day at school, and their lives at home, were no longer marked by a sense of formality by which to distinguish a serious, important event from a trivial occasion.

Her comment struck me as being broader than just a "kids today" observation. Many of us have become too busy, too bombarded with stimuli, or just too tired to provide our lives with the rhythms of formal observance that help us to distinguish important from trivial events, deep occasions from transient stimulation. "Provide" is the right word, because occasions are celebrated only when we make the effort to mark them by constructing a special mood and feeling.

Our collective failure to mark events with a sense of occasion is glaringly apparent in the beekeeping community, and perhaps provides an explanation for why some meetings are fantastic while others are eminently forgettable. The rhythm of our worst beekeeping meetings is a drone of tone, in which speaker after speaker presents talks or opinions about issues, but nowhere is the meeting marked by a sense that we enjoy being together and respect each other's presence. In other words, they are just meetings, and we don't make the extra effort to turn them into occasions.

Perhaps the best way to describe the lack of occasion at meetings is to look for the opposite, those meetings that were punctuated by a feeling that something important was happening. Of course, the easiest examples are meetings when, in fact, a special occasion *was* being observed. The most obvious are those times when awards were presented, retirements noted, or new initiatives kicked off. I think, for example, of the retirement "roast" hosted by the Manitoba Beekeepers' Association to honor Cam Jay when he stepped down from his post as professor at the University of Manitoba. This occasion was marked by a banquet in Cam's honor, at which person after person got up and told stories, poked fun, and occasionally even waxed sentimental about Cam and his career. This event, and any other event, could have been cobbled together with nothing more than a briefly mumbled speech and a gold watch, but the beekeepers put in great effort to insure that it would be conducted with a sense of occasion.

While a properly delivered sense of occasion will recognize that some meetings are more "important" than others, we need to work harder to make ordinary meetings more occasionlike. Even the most local, monthly meetings can become special by introducing rituals to mark the meeting's rhythm. In the past, meetings would begin with a prayer, but prayer is no longer considered acceptable in nonreligious settings. Nevertheless, you don't have to invoke a deity to begin a meeting with ritual. Perhaps just having someone stand up and give a non-denominational appreciation for getting together would set a tone for beekeepers to value and enjoy each other. I can't help but think that the rancorous exchanges that too often are the norm at beekeeping meetings would diminish if we started our meetings by publicly and vocally recognizing that we're supposed to be enjoying each other rather than fighting.

Continued on Next Page

"While a properly delivered sense of occasion will recognize that some meetings are more 'important' than others, we need to work harder to make ordinary meetings more occasionlike."

There are other rituals that might be introduced into your meetings. For instance, a formal thanks to individuals who booked the hall, made the coffee, or set up the chairs elevates the occasion from taking it for granted to one of appreciation. A repeatable and recognized rhythm to a meeting also adds a sense of occasion. In addition to the usual presentation, perhaps ask a different beekeeper at each meeting to prepare a short, five-minute report on something that happened relating to his or her beekeeping that month. Another excellent way to elevate meetings is for groups to be working toward a common goal. Raising money for a small library, organizing school visits to inform students about bees and beekeeping, or preparing for a field day are great ways to provide the common purpose that turns meetings into occasions.

Indeed, a sense of occasion is best constructed by building a sense of common purpose. This was brought home to me last October, at the annual meeting of our British Columbia Honey Producers Association (BCHPA) in Williams Lake, B.C. Our group, like most beekeeping organizations, is perpetually short of money, and the lack of funds has been a serious impediment to the programming that the organization would like to provide. Nevertheless, the BCHPA wanted to sponsor a session at the upcoming 1999 Apimondia meeting in Vancouver, but lacked the $5,000 sponsorship fee. However, at a previous meeting the group had decided to establish a BCHPA apiary with donated hives and labor, and use the proceeds from honey sales to fund the symposium sponsorship. Immediately, one beekeeper had stood up and said he would donate hive equipment, another jumped up and said he would provide some bees to start the hives, a third chimed in with his willingness to manage the bees, and within a few minutes the apiary was off and running.

At the October meeting, the gentleman in charge of the apiary reported the results of the Summer's management: Over $8,000 had been raised by selling honey at the end of the season, enough to sponsor a session as well as provide additional funds for other needs. This was exciting because the beekeepers had banded together with a common purpose and more than accomplished their goal, but what was most noticeable to me about this accomplishment was that the beekeepers attending this meeting elevated the accomplishment into an occasion. It was recognized clearly on the meeting floor and during the banquet, with formal thanks delivered to those who participated. In addition, the hall talk during the breaks was full of plans to extend this project to other needs, replete with mutual congratulations and the glow of success that changes an ordinary event into something special.

The BCHPA also has a wonderful tradition of presenting speakers with small gifts. Williams Lake, B.C., is rodeo country, and at the end of the meeting each invited speaker was given a framed print by a local artist of a cowboying scene, with an engraved plaque underneath saying simply "In Appreciation, BCHPA Convention 1997, Williams Lake, B.C." I rode back to Vancouver with some of the speakers, and they were obviously touched and moved by this small gesture, a gesture that elevated the meeting from "just another beekeeping meeting" into an occasion.

Cutting up together also can help to bond individual beekeepers into groups with a common purpose. One of the first meetings I attended after arriving in Canada was out in the very cold province of Manitoba in the dead of Winter. During the banquet, one beekeeper wearing a jacket and tie approached the podium and began telling a tear-jerking story about how his beekeeping business had collapsed that year, while nervously fidgeting with his tie, jacket and shirt. I was getting quite concerned, and couldn't understand why everyone else in the room was suppressing chuckles at hearing about this poor guy's misery. Sure enough, there was a punch line about how nothing had worked for him that year, and in the end he tearfully exclaimed that he had lost his shirt, at which point he somehow yanked his shirt off without removing his jacket and tie. Corny, just a magic trick, everyone but me had seen it before, but nonetheless the beekeepers and accompanying spouses hooted and hollered at the end. I was stunned, since I hadn't seen it coming, but I also had never seen anything quite like this in my previous, more staid experiences at U.S. meetings.

Yes, it takes some effort to produce a sense of occasion. Someone has to get up to say the thank yous, present the awards, evoke the feel-good emotions to recognize the accomplishments, or give the inspiring speeches to generate a common sense of purpose. The formality of an occasion does not have to be something we used to do in the olden days. Occasions have become a less natural and regular part of our lives, and may require a conscious effort to re-establish their traditions, but the rewards of better meetings, greater attendance and mutual respect are more than worth the effort. BC

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THE HYGIENE QUEEN

Screening *your* bees for hygienic behavior just got easier.

Marla Spivak & Gary Reuter

Hygienic behavior of honey bees is the primary natural defense against American foulbrood (Park et al., 1937; Woodrow and Holst, 1942; Rothenbuhler, 1964) and chalkbrood (Gilliam et al., 1983). Hygienic bees detect, uncap, and remove diseased brood from the combs before the disease becomes infectious. Hygienic behavior also is one defense against *Varroa* mites (Peng et al., 1987), and although it is not the main mechanism of resistance to the mites (Harbo and Hoopingarner, 1997), it appears to limit their reproduction and population growth to some degree. Our studies have shown that it is possible to select for hygienic behavior without compromising honey production or gentleness (Spivak, 1996; Spivak and Reuter, in press). The trait can be found in approximately 10 percent of the managed colonies found in the United States, in any race or stock of bees. We feel it would benefit the beekeeping industry to have hygienic lines of bees commercially available.

In this article, we present a simple way of screening colonies for hygienic behavior. We also discuss some frequently asked questions about the behavior, and how to breed hygienic colonies.

Using Liquid Nitrogen

For years, we screened colonies for hygienic behavior by cutting out a section of comb (2 x 2.5 inches) containing sealed brood, freezing it for 24 hours, then placing the frozen comb section in the colony to be tested. If the test colony was hygienic, the bees would uncap and remove the freeze-killed brood within 48 hours when tested repeatedly (Taber, 1982; Spivak and Downey, 1998). Cutting comb sections out of frames is relatively messy and damages the combs, so we sought a better way of killing brood without having to handle the combs.

Dr. Jerry Bromenshank at the University of Montana was the first to suggest using liquid nitrogen (N_2) to freeze a section of sealed brood within the frame. He found that freezing the brood this way was more efficient than cutting, freezing, and replacing comb inserts. Based on his suggestions, we conducted several tests to determine how much liquid N_2 was necessary to completely kill the brood, and whether the test yielded the same results as cutting and freezing comb sections. We are now convinced that freezing brood with liquid N_2 is the best screening procedure found to date for assaying hygienic behavior.

Liquid N_2 is relatively inexpensive and easy to obtain; check with your local veterinarian or livestock artificial inseminator. It must be kept in an appropriate tank and securely fastened to the truck during travel to avoid spillage.

Common sense and several precautions must be used when handling liquid nitrogen. It has a boiling temperature of -320°F (-195.8°C) which means that it is extremely cold and will kill skin (causing severe frostbite) on contact. Protective clothing including heavy gloves, boots, a face shield and safety glasses should be worn. The boots should be sufficiently secure so that the liquid N_2 can not be spilled into them.

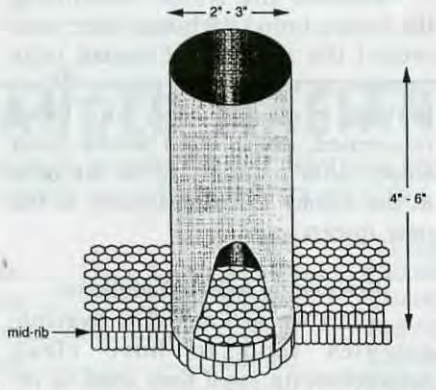

Diagram of the hollow cylinder through which the liquid N_2 is poured to freeze a circular section of sealed brood. The cylinder is twisted into the comb down to the midrib. The cylinder should be 4-6" in length and from 2-3" in diameter.

You will need to construct (or find) a hollow cylinder into which you will pour the liquid N_2 to freeze a circular section of sealed brood. We have been using a 3-inch diameter cylinder, cut from galvanized clothes-dryer vent. The cylinder must be at least 4 inches long because the nitrogen will boil on contact with the brood. The thinner the walls of the cylinder, the easier it is to press into the comb assuring a good seal.

A tank holding liquid nitrogen (N_2). Liquid N_2 may be obtained from a local livestock inseminator. This particular tank is fitted with a valve for dispensing the liquid N_2. Use protective clothing to prevent severe frostbite.

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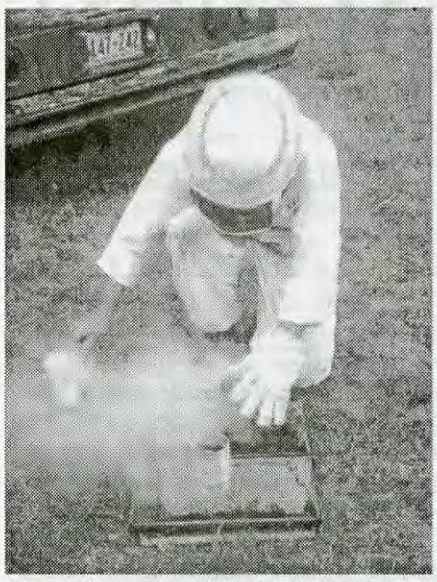
QUEEN ... Cont. From Pg. 23

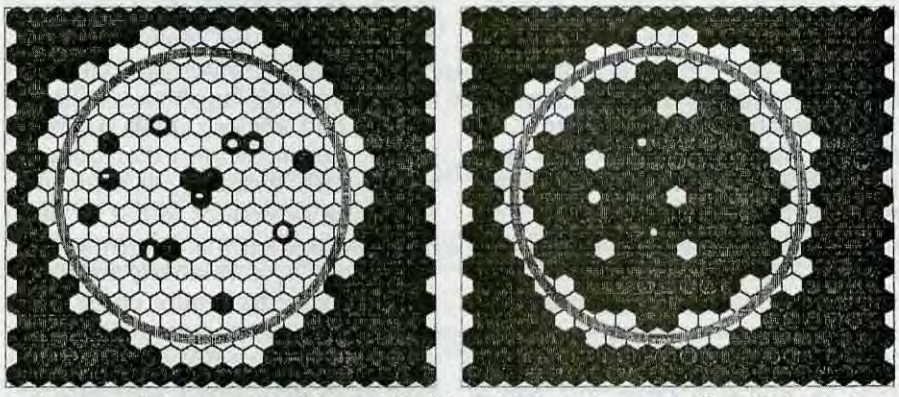


About 10 ounces of liquid is poured into the cylinder using a Styrofoam cup. The cylinder in the comb toward the back is not visible beneath the beekeeper's glove and the N_2 vapor.

Nine to 10 ounces (250-300 ml) of liquid N_2 is needed to freeze-kill all the brood (approximately 160 cells) within a 3-inch diameter cylinder. A smaller amount will not kill all of the brood, leading to erroneous results. Use a 10-ounce or larger Styrofoam coffee cup for measuring and pouring. Other materials will shatter on contact with the liquid N_2.

Select a frame with at least a 3-inch diameter circle of sealed brood containing fewer than 30 unsealed cells within the circle. Lay the frame horizontally across a support (i.e. an empty super). Twist the metal cylinder into the sealed brood until it reaches the midrib. Record the number of unsealed cells inside the cylinder. Pour a couple ounces of the liquid N_2 into the cylinder and wait for it to freeze the edges or evaporate. Then pour the remainder of the liquid N_2 into the cylinder. Wait to remove the cylinder until it thaws, which may take three to five minutes. If you have additional cylinders, you can start the next test while you are waiting for previous ones to thaw. We put a thumbtack in the top of the frame to mark the frame and the location of the test on the frame. Some hygienic colonies clean and repair the comb so quickly that it is hard to locate the test when you return. Place the frame in the center of the brood nest.

After the liquid N_2 is poured into the cylinder, it may take 3-5 minutes for the cylinder to thaw sufficiently before it can be removed without damaging the comb. Note the frost on the sides of the cylinders.



A diagram of the amount of freeze-killed brood left in the comb after 48 hours in a hygienic colony (left), and a non-hygienic colony (right). Dark colored cells represent sealed brood and white cells represent empty cells. Some sealed cells have been partially uncapped. In the hygienic colony, 95% of the dead brood was completely removed from the comb.

Remove the frame containing the frozen brood 48 hours later, and record the number of sealed cells remaining within the circle. When testing a colony that has been requeened, six to eight weeks must elapse after requeening for the bees in the colony to be daughters of the new queen.

Frequently Asked Questions

Often we are asked if hygienic colonies tend to have clean bottomboards, or if they tend to remove debris (such as wax paper, newspaper or cardboard) from the colony more quickly than other colonies. Mayer (1996) suggested that if colonies eat grease patties quickly, they might be hygienic. Removing debris from the hive is a form of cleanliness, but it is not necessarily a sign that the bees carry the hygienic trait.

Although the common usage of the word hygienic denotes cleanliness, hygienic behavior is a specific response by the bees to diseased and parasitized brood. A colony that keeps its hive clean does not imply that it will be resistant to diseases. Colonies must be screened for hygienic behavior using an assay such as the one described above. If a colony removes all of the freeze-killed brood within 48 hours, the colony will probably be resistant to diseases and will tend to remove mite-infested pupae. To determine whether they can actually resist the diseases or mites, the colony would have to be challenged with American foulbrood, chalkbrood or mites.

Another question we encounter concerns the difference between hygienic and grooming behaviors. Grooming behavior involves an interaction between adult bees; one bee removes mites or debris from the body of another bee. Alternatively, a bee may groom herself. Grooming and hygienic behaviors are different traits, and selecting for one does not imply selection for the other.

It is assumed by some beekeepers that hygienic behavior is associated with a high degree of defensive (stinging) behavior. This assumption stems from the reputation of the Brown line of hygienic bees studied by Rothenbuhler. Rothenbuhler (1964) showed that stinging behavior and hygienic be-

"Years of research experience have clearly shown that it would greatly benefit the beekeeping industry if productive, hygienic lines of bees were available commercially."

havior are inherited separately. Our experience has shown that hygienic colonies are as gentle as the stock from which they were bred.

Propagating Hygienic Colonies

Any race or line of bees can be bred for hygienic behavior. We recommend that bee breeders select for hygienic behavior from among their best breeder colonies; i.e., from those that have proven to be productive, gentle, and that display all the characteristics desired by the breeder. A breeder can get a head start on selecting for hygienic behavior simply by rearing queens from colonies that do not have chalkbrood.

When colonies are first screened for hygienic behavior using liquid N_2, they may not remove all of the frozen brood within 48 hours. The colonies that remove the most freeze-killed brood within 48 hours should be propagated by rearing queens from them. Subsequent generations will remove the brood more quickly, because hygienic queens from the first generation will produce drones for the second generation. If the hygienic queens are instrumentally inseminated with semen collected from drones from hygienic colonies, or are mated naturally in an isolated area, where all the surrounding drones are from hygienic colonies, it will be easier to fix the trait in your line of bees.

Beekeepers should rear queens from unrelated hygienic colonies each year to avoid the negative effects of inbreeding. In time, if many bee breeders select for hygienic behavior, the frequency of the trait should increase in the general population of bees, which will increase the chances that any queen will encounter drones that carry the trait.

The effects of American foulbrood, chalkbrood and *Varroa* mites can be alleviated if queen producers select for hygienic behavior from their own lines of bees. Because a small percentage of the managed colonies today express hygienic behavior, it is important for many bee breeders to select for the behavior to maintain genetic variability within and among bee lines. Our experience has shown there are no apparent negative characteristics that accompany the trait. Years of research experience have shown it would greatly benefit the beekeeping industry if productive, hygienic lines were available commercially. BC

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Coming To A Field Near You

Transgenic plants are almost everywhere. And *your* bees are, or soon will be foraging on them. Are you concerned? Should you be?

David Gerry

If your bees are not already foraging in fields of genetically engineered crops, they soon will be. In 1997, 14 percent of the U.S. soy acreage was planted with beans that were genetically modified, up 12 percent from the year before. Next year, Monsanto is projecting 4.5 million acres of genetically modified cotton, more than a five fold increase over this year's 800,000 acres. Since this trend to transgenics is accelerating, how can you reconcile their presence in your honey with the customer's expectations of a 'natural' product? How should honey be positioned in future markets? How will these crops containing foreign genes affect honey, pollen, brood or hive health?

What is Genetic Engineering?

Genes are like a live computer software program which controls the production of every protein, the building blocks of all life. Genes ensure that correct proteins are made, at the right time and place and in the correct amount in all living tissue. Experience has now shown, however, that genes are not interchangeable between plants, bacteria and animals the way blocks of computer code are movable between different software programs.

Traditional plant and animal breeders cross related species to attain desirable traits. Developing a red squash this way would mean finding a red trait in a plant that could breed with squash. Genetic engineering, however, will now allow a red gene from any source – a flower, a tree or an insect – to be spliced into the genetic sequence of the squash.

One of the ways genetic engineers transfer genes between dissimilar organisms is through viruses. The disease-causing portion of the virus is deleted, and then the modified virus shuttles a package containing genes for the desired traits into the target plant or animal. The package often contains a portion of a bacterium which is antibiotic-resistant to act like a bookmark. This marker is a convenient way for the biotechnicians to identify which of the numerous attempts at transference of traits has been successful.

Biologists have long held that species' boundaries are inviolate, i.e., that different species cannot successfully reproduce. Genetic engineering techniques enable us to circumvent these boundaries. Surprisingly (perhaps), more recent research has now shown that microorganisms probably never abided by the species barrier 'law.' For example, when different types of plants genetically modified with an antibiotic-resistant gene were grown with a commonly occurring soil fungus, the fungus subsequently acquired the antibiotic-resistant gene[1].

This means that the soil is both a reservoir and a highway for gene flow between plants and microorganisms. And as we will see this has significance for bees and their keepers.

Proponents of biotechnology claim that it can produce plants and animals with previously unimagined characteristics, efficiently and precisely. This belief has been borne out in controlled environments, with simple microorganisms (such as viruses, bacteria and fungi) producing compounds such as insulin for people and rennet for cheese making.

However, as many cotton farmers in Mississippi, Arkansas, Tennessee and Louisiana[2] discovered this year, producing cotton in fields from transgenic crops is not as easy as producing rennet from modified bacteria in vats indoors. While it is not yet understood exactly why so many of the cotton bolls were either stunted or fell off, several things are well-known (to geneticists)[3]. A foreign gene placed in a new host will not reliably perform exactly the same function as it did originally. It may disrupt some other ongoing functions, and the target plant may try to inactivate or eliminate the foreign gene.

An example of how genetic modification can disrupt normal cell function was the Flavr-Savr tomato. It incorporated flounder genes to resist frost damage; however, the skins were too delicate, and it bruised so easily that it could not be moved from field to market.

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[1] T. Hoffman, C. Golz & O. Schieder (1994) *Curr. Genet.* 27: 70-76.
[2] "Genetically Engineered Cotton in Jeopardy," by Marc Lappe and Britt Bailey, Center for Ethics and Toxics, September 10, 1997.
[3] M. Antoniou *Nutritional Therapy Today* (December 1996) Vol. 6 (No.4):8-11

"Last year one in seven acres of soybeans was transgenic (vs. one in 50 the year before), which means that genetically engineered plants are rapidly becoming part of most farming practices."

Coming Soon to a Field Near You

The best available data[4] for last year's plantings of transgenics comes from Monsanto. Globally, they have the largest market share of all of the biotech companies.

Crop	U.S. Acres
Canola	70,000
Corn	3,000,000
Cotton	3,260,000
Potatoes	25,000
Soybeans	9,000,000
Total U.S.	**15,355,000**

Although the total acreage planted in Canada of transgenic crops was very modest (3 percent) compared to the U.S. plantings, 24 percent of the Canadian canola crop was genetically modified. This means that if current trends continue, not only most commodity crops but also most common fruits and vegetables will be altered by this technology in five to eight years.

Which Crops, How They Are Modified

There are at least 48 plants undergoing genetic modification for commercial release[5]. Characteristics being modified include: disease and insect resistance, herbicide tolerance and market qualities such as shelf life, frost resistance, etc. Of particular interest to all beekeepers are those crops that have been or will soon be released which contain their own insecticide. Potatoes, corn and cotton containing an insecticide comprised about one-third of the U.S. transgenic plantings last year.

This pesticide has been one of the safest and most cost-effective pesticides on the market. It comes from the common soil bacterium *Bacillus thuringienis* (Bt) and it kills specific target pests by binding to the midgut membrane[6]. Since first commercially available in 1930[7] the sales of Bt have grown to $60 million a year[8]. Bt, in foliar form, does little or no harm to people, wildlife or even other insects. It does not accumulate in either the soil or the water. It's safe enough that it is one of the few insecticides permitted for use by organic farmers, and it can also be used in metropolitan areas to control mosquitoes. Despite various long-term and wide applications, there is little or no evidence of the emergence of resistant pests.

Bees and Bt

First-year results from an ongoing three-year study at the Laboratory of Comparative Invertebrate Neurobiology in France[9] *may* indicate a possible build-up in honey of insecticide toxins genetically engineered into rapeseed. While detectable levels of the protein were not found in the pollen or nectar of the rapeseed, it was assumed that the toxin *could* become concentrated in the honey. Experimenters fed bees a sugar solution containing up to 100 times the protein found in the genetically engineered rapeseed. Bees fed this solution for three months died 15 days earlier than those fed normal sugar. These bees also found it difficult to distinguish between the smells of different flowers after 15 days.

In general, the impact of large-scale, long-term plantings of so many different transgenic crops is not understood. In particular, the effects on bees of genetically expressed insecticides are not known. To address this crucial gap in our understanding, building coalitions with groups such as farmers who depend upon your pollination services may be the quickest way to get these items on the research agendas of local colleges and universities.

Groundbreaking research by North Carolina State University entomologist Fred Gould[10] has shown that a cotton-eating moth (*Heliothis virescens*) could develop resistance to Bt in plants in just three to four years. There is also an indication that the simplified toxins used in genetic engineering resist degradation and remain toxic[11]. In September 1997, 31 groups began legal action against the EPA, seeking to have approval for Bt crops to be rescinded. One of their primary concerns was that rising insect resistance could cause the loss of effectiveness of this important biopesticide.

The "one gene-one pest" approach will inevitably fail. For beekeepers, this means that new versions of these crops, with their unknown side effects, will continually have to be introduced to keep up with ever-changing resistance in pests. So now you will not only have to be vigilant about insecticides *on the crops*, you will also have to become informed about insecticides *in the crops*.

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[4] compiled from *The Gene Exchange* Fall 1997, page 11.
[5] For a detailed list of transgenic plants now being developed see J. Rissler & M. Mellon *The Ecological Risks of Engineered Crops*, MIT Press page 12.
[6] S. Gill, E. Cowles, & P. Peitranonio (1992) *Annu. Rev. Entomol.* 37: 615-636.
[7] C. Beegle & T. Yamamoto (1992) *Can. Entomol.* 124: 587-616.
[8] S. Gilman *The Natural Farmer* Winter 1997.
[9] C. Crabb *New Scientist* (1997) Aug. 16
[10] F. Gould et. al. *Proc. Natl. Acad. Sc.* (1997) 94: 3519-3523.
[11] J. Doyle et. al. *Advan. in Ap. Microbiol.* (1995) 40:

Bees as Vectors

Researchers at the University of North Dakota have used bees to carry powdered Bt insecticide to control the sunflower moth. With all of the genetically engineered crops in the fields, bees may now also inadvertently become vectors for many other agents in the rapidly evolving farm environment.

The success of genetic engineering is due in part to constructing vectors (often derived from disease-causing viruses),[12] which overcome the target species' defense mechanisms. Although the disease-causing portion of the virus is deleted in preparing these vectors, experiments by Agriculture Canada[13] show that the deleted characteristic can reappear one in eight times in the next generation.

The risks of unwanted recombinations are not therefore just theoretical. The Austrian government has banned the import of genetically modified corn that was developed using an ampicillin-resistant bacteria marker. Their concern is that this resistance could transfer to any number of microorganisms in the gut of a cow fed such corn and then onward to people.

Bees are going to be exposed to genetic material in combinations which they have never encountered. The best way to understand these challenges is to find out: what crops are being grown in your areas of operation that have been genetically engineered; what is the source of the new genes; what markers were used to develop same, etc. This information will assist you in both obtaining assistance specialists and providing factual information to your customers.

Allergies, Food and Biotech

Proteins, not sugars (such as honey), are the cause of allergies; therefore, alterations of pollen from transgenic crops might affect people. Critics claim, however, that allergic reactions are possible to some of these novel genes which have not previously been part of the human diet.

This claim has been at least partially borne out by research. To eliminate the need to supplement soy meal-based livestock rations, Pioneer Hi-Bred International developed a transgenic soybean using a protein from Brazil nuts. For some people exposure to Brazil nuts can produce severe or even fatal allergic reactions. An experiment[14] was designed to test whether or not the soybean engineered with Brazil nuts provoked allergic reactions. Blood samples from all 12 subjects indicated strong allergenic reaction. (As a result, Pioneer withdrew the transgenic soybean because they recognized that it would be impossible to completely segregate this bean from the human food chain.)

Allergenicity can therefore transfer from the source genes to some target crops or organisms. Although a very remote possibility, this transference might have implications for marketing honey (with traces of altered pollen) from transgenic crops. Dr. Marion Nestle is Chair of the Department of Food Studies at New York University. In an editorial in the same issue of the *New England Journal of Medicine* which published the landmark soy/Brazil nut study, Dr. Nestle observed that "...the responsibility for protecting the public against uncommon or unknown allergens in transgenic foods will continue to be delegated to industry and [is] largely voluntary."[15] So, which agencies do you turn to to find out about new transgenic crops, health standards, etc?

How is Biotechnology Being Regulated

The best overview of these issues has been published by the Iowa State University and is called "Regulation of Genetically Engineered Organisms and Products." Although it may seem overwhelming to find out which gene or which antibiotic marker was used to make squashes resistant to viruses, many databases on the Internet are available for just such a purpose. An annotated list of about 40 useful Websites is available at http://www.nbiap.vt.edu

Who's Going to Know?

The reliability of tests which can detect genetically altered substances is currently controversial. There is one company in Iowa which can test specific kinds of products for the presence of GMOs. The Europe Commission has just established a research facility which, within two years, is to be able to identify 26 of the 28 GMOs currently permitted on the market. More reliable testing methods are coming, so soon tests will identify the presence of a GMO in a final product.

More important than test results, how are you going to feel when customers ask you directly about biotech and honey?

To Label or Not

US Secretary of Agriculture Dan Glickman is so adamant that genetically modified organisms (GMOs) not be either segregated or labeled that he has threatened to sue countries like Austria (through the World Trade Organization) which ban transgenic products. Unlike here, the presence of GMOs in food is highly controversial in Europe. Consumers there are cynical about the role of government agencies in protecting public health after the (preventable) outbreak of mad cow disease. Caught between the bickering authorities and anxious customers, the Institute of Grocery Distribution in England has produced (after a four-year study) a 28-page guide[16] for grocers on how to label foods containing GMOs.

Despite Glickman's intransigence, Safeway stores in England have successfully sold a tomato puree made from genetically modified

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[12] Mae-Wan Ho *The Ecolog.* 27:(No. 4).
[13] K. Kliener *New Scientist* (1997) Aug. 16
[14] J. Nordlee et al *N. Engl. J. Med.* (1996) 334: 688-92.
[15] M. Nestle *N. Engl. J. Med.* (1996) 334: 726-8
[16] *Communication and labelling guidelines for genetically modified foods*, March 1997.

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tomatoes. They launched the product in 60 of their 398 stores February 1996, with point of purchase material explaining how the product was developed. Spokesman Tony Combs reported in November (1997) that they had sold more than 750,000 of the 170-gram cans, far exceeding their launch expectations.

A lesson to be learned here is that with adequate information, some consumers will accept transgenics in their food. Last year one in seven acres of soybeans was transgenic (vs. one in 50 the year before), which means that genetically engineered plants are rapidly becoming part of most farming practices. It is, therefore, a case of *when*, not *if* you confront the issue of honey from transgenic crops with customers. Taking the initiative now rather than waiting until consumers raise the issue means greater influence, as Safeways has found, on the customers purchase decision.

Why Meet Trouble Halfway?

Even public relations experts like Burston Marstellar, retained by Monsanto, concede that the activists and environmental groups have been more effective in the controversy that has arisen in Europe surrounding the introduction of transgenic food. To avoid being trapped into responding to either the agenda of the biotech industry or its numerous detractors, beekeepers should collectively decide how best to position honey in the market, given the rising tide of transgenics.

"If scientists and managers want consumers to have the facts about food biotechnology, all they need to do is state them where they will do the most good – on the product labels.... Labeling is the easiest way to inform the public and end the controversy" said Dr. Nestle. BC

David Gerry is a free lance writer from Victoria, British Columbia. He states, "I learned about genetic engineering at a conference on intellectual property and was awed by the implications of this rapidly emerging science. Like the Industrial Revolution or the advent of the computer age, biotechnology also will have a profound impact on how we live. Unlike Europe, where biotechnology is controversial, here in North America there is very little public discussion on the topic. And yet, paradoxically, North America is the hotbed of development of biotechnology processes and products. My purpose in writing is to bring to wider public circulation debates which are raging in the specialized scientific journals."

Handling Swarms

Catching & Hiving Swarms is profitable, and awesome

Richard Taylor

The swarm control methods I discussed last time all involve opening up the brood nest, either by splitting the colony or otherwise. There are of course, other approaches, and I should mention some of them.

A colony will almost never swarm if deprived of either its queen, its brood, or its field force. If the queen is rendered unable to accompany a swarm, by having a clipped wing, for example, or by being captured after the swarm has emerged, then the swarm will not abscond. Clipping the queen's wing in no way prevents swarming, however, and the bees fly off with the first virgin queen to emerge, so this is no method of control. You can deprive a colony of enough brood to delay swarming, if not prevent it, by making splits and nucs, as described last time. And a colony loses its field force at a single stroke if you move the hive to a new spot in the same apiary. But this, too, provides no good method of control, because the field bees, that is, the entire foraging force, return to their original stand, and those are the very bees you need to get your honey crop. I have tried switching hives around in an apiary, exchanging the places of strong colonies for weak ones, thereby depriving the strong ones of their field bees and augmenting the foraging forces of the weak ones, but this does not work well either. The field force, entering the new hive, finds there a strange queen, who is likely to be murdered on the spot, especially in a weak colony. It is also quite a lot of work.

"Swarming is not always a bad thing. When you hive a swarm, even if it is from your own apiary, then you've got yourself another colony."

Of course you can always swarm a colony artificially, by moving the hive to one side and shaking maybe half the bees from the combs, together with their queen, giving them something, there where the hive was, to cluster on. But this is hardly a method of controlling swarming; quite the contrary. And the convenience of getting a swarm at a time of your own choosing hardly justifies all the work. You might better just let them swarm in their own way, and hope to be able to recover the bees.

The clearest sign of swarm preparation is, of course, the construction of queen cells. So it immediately occurs to a beekeeper to prevent the swarm by destroying the queen cells. The bees will not swarm without ensuring a virgin queen to take over the colony that is left behind. And there are beekeepers who do this. Go through the hives every week, shake the bees from the combs, destroy every last queen cell, and no swarm will emerge. But there are problems with this, the biggest one being that it is an awful lot of work. The bees build new queen cells almost as fast as you can destroy them and if you miss a single cell, which is likely to be an inconspicuous runt cell, then your labor has been wasted, because the bees will swarm and let the runt queen take over. Destroying queen cells is also an assault upon the colony, and thus violates one of my fundamental rules of beekeeping, which is, to work always with the bees and not against them. When you try to apply force to bees, to get them to do what you want them to do, against their own powerful impulse, then they usually have a way of defeating you. I tried the method of destroying queen cells in my home apiary many seasons ago, and I found, in the end, that half the colonies swarmed anyway, after about three weeks of this, leaving only partly finished queen cells behind. It almost drove me nuts and I decided then, never again.

Swarming is not always a bad thing. When you hive a swarm, even if it is from your own apiary, then you've got yourself another colony, and in case it came from another apiary, then that beekeeper's loss is your great gain. But when you hive it, make sure it is going to stay put by giving it a comb of brood. If the swarm is high in a tree, way out of reach, you can bring it down by raising a comb of brood up to it. Thus, put a comb of brood from one of your hives in some sort of basket, with the comb protruding so the bees will find it, and toss a string over the branch near the swarm. Then use this to pull a clothesline rope over the branch, raise the basket and comb, so the brood is in contact with the swarm, and after a while most of the bees will be clustered on the brood and basket and you can lower them.

If you are in your apiary when a swarm emerges, then it is your good luck to know which colony has swarmed, and you can put this knowledge to great use. Move that colony off to one side and hive the

Continued on Page 34

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B2	C/5	Met. Covers w/inner	138.00	51 lbs.
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B9	C/5	Inner Covers only	53.65	12 lbs.
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B14	**C/1**	**Slatted Rack**	**10.50**	**4 lbs.**
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G16	C/100	9-1/8 Frames	107.50	45 lbs.
H8B	C/10	Deep Wired Fnd.	13.35	2 lbs.
H11B	C/50	Deep Wired Fnd.	63.75	8 lbs.
H21	C/10	Deep Medium Brood Fnd.	11.20	2 lbs.
H23	C/50	Deep Medium Brood Fnd.	52.10	8 lbs.
B50	C/10	Frame Supports	2.50	1 lb.
G50	C/100	Wedges for Top Bar	15.75	2 lbs.
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B57	C/1	Spacers	.50	1 lb.
G50	C/100	Wedges for Top Bar	15.75	2 lbs.
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G28	C/100	5-3/8 Frames	99.75	37 lbs.

CAT. NO.	PKG.	DESCRIPTION	RETAIL	SHIPPING WEIGHT
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G50	C/100	Wedges for Top Bar	15.75	2 lbs.
H27	C/10	Shallow Med. Brood Fnd.	7.40	2 lbs.
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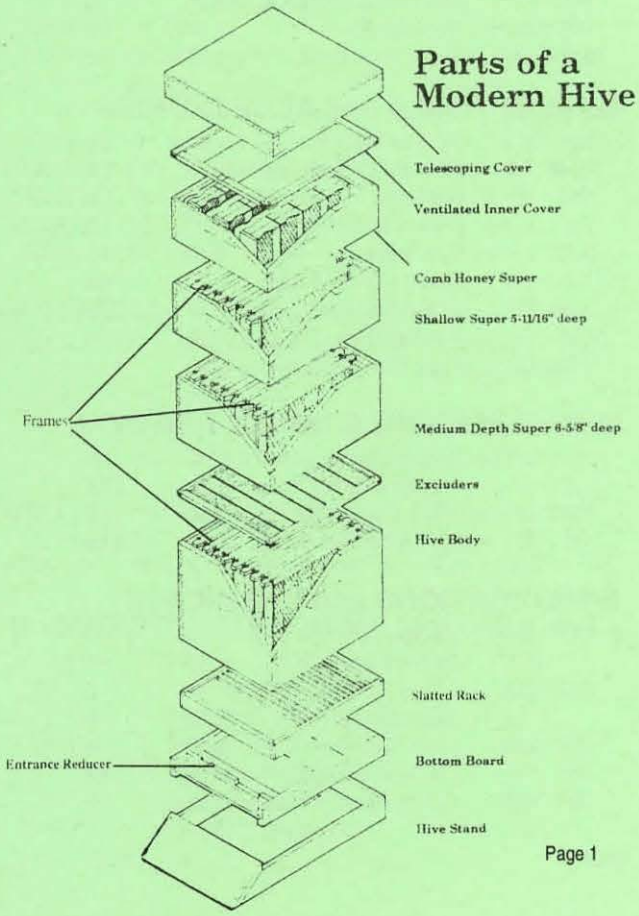

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N16A	C/1	White Ventilated Helmet	13.50	1 lb.
N16C	C/1	White Plastic Helmet	13.00	2 lb.
N20	C/1	Replace. Zipper Veil	22.00	1 lb.
N19	C/1	Coveralls w/veil (All sizes)	84.00	5 lbs.
N95	C/1	Coveralls (All sizes)	52.00	4 lbs.
N95 (XL)	C/1	Coveralls (XL)	52.00	4 lbs.
N98	PR	Leg Straps	4.00	1 lb.
N21	PR	Med. Soft Leather Glove	18.00	1 lb.
N22	PR	Large Soft Leather Glove	18.00	1 lb.
N22X	PR	XL Soft Leather Glove	18.00	1 lb.
N25A	PR	Small Vinyl Impreg. Glove	14.00	1 lb.
N25	PR	Med. Vinyl Impreg. Glove	14.00	1 lb.
N26	PR	Large Vinyl Impreg. Glove	14.00	1 lb.

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P38	1 lb.	Paradichlorobenzene	7.00	2 lbs.
P39P	C/10	Menthol Crystals, 10 packs	41.50	2 lbs.
PA10	C/10	Apistan® Strips 10's	25.00	1 lb.
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Q17	C/24	1 lb. Gamber Jars w/lids	15.00	15 lbs.
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/78924	C/60	63mm Lids Only (2 lb.)	8.00	2 lbs.
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SWARM STORIES

SWARMS ... Cont. From Pg. 32

swarm there on the parent stand. Result? You get a very powerful colony, having been augmented by all the foraging bees from the parent colony, and it is one that is very unlikely to swarm, since it has no brood other than the comb you may have given it to make it say put. And the parent colony is not likely to swarm either, since it has lost all its foraging bees. It rebuilds fast, having lots of brood and a new queen, and the swarm, now on the parent stand stores up an unbelievable crop of honey. This procedure is called "padgening" or, I suppose, more correctly, "pagdening," since it was first described long ago by a British beekeeper named Pagden.

Of course, you are more likely to find a swarm in your apiary and have no idea which hive it came from, and it is very difficult to tell just by inspecting the hives. Sometimes, after you have gathered the swarm, you will find some of the bees you missed back at the entrance to their hive, fanning their wings and extending the nasanov glands on their abdomens. Then you can go ahead and do the padgening as described above. Or you can take some of the bees from the swarm, shake them about in a bag with a bit of flour in it, release them, and then look to see which hive has a few bees with flour on them fanning at the entrance. But this, I have found, while it sometimes works beautifully, sometimes does not work at all.

There is something deeply satisfying about hiving a swarm. Since the bees are full of honey, they draw foundation out beautifully. And you get a new colony, one that is very industrious but will not be likely to swarm again that year, so you don't need to worry about that. And, of course, the bees are very valuable; you would have to pay a lot to get that many bees shipped to you in packages. You also put to use some equipment that was doing you no good at all.

Some beekeepers assume that the way to get a swarm hived, whether it is in your own apiary or a stray swarm you have been summoned to deal with, is to take a hive to it, hive it right there, then go back later to get the hive and move it to where you want it. This is a lot of trouble. It is vastly better then to gather it into a swarm cage, which is simply a hive body, screened on one side and with a hinged screen on the other. A very large funnel can be inserted into a hole in the top (that is, what was the side of the hive body), and the bees are then shaken from whatever they are clustered on into the funnel. This way you can cart the bees away at once, and then hive them at a time and place that suits your convenience. If you are going to keep the bees in this swarm cage more than a couple of days, however, you'll need to give them a sugar syrup jar over the funnel hole, so they don't starve.

Stray swarms, as well as swarms from your own apiary, can sometimes be lured into bait hives. A bait hive can be nothing more than an old hive body you've got lying around, with some sort of bottom and cover, and an entrance, which can be nothing more than a hole or large crack, and inside it, an old, dark honeycomb. This should be up off the ground perhaps six feet or so, but where you can easily get it back down. It greatly enhances the likelihood of a swarm taking it over if you use a synthetic pheromone lure. These lures can be purchased from the Brushy Mountain Bee Farm, and perhaps other places. If a swarm takes over the bait hive, then you will, of course, transfer it to a proper hive, a simple enough task if the swarm has not been there long enough to have built much comb.

I don't know how many swarms I have gathered over the last several decades, but seeing a swarm march into a new hive still fills me with awe. I never miss a chance to demonstrate it for an onlooker when I can, always with stunning effect. I spoke last time of the apparent sagacity of swarming bees, of their sudden adaptation to totally new circumstances, and one sees the same thing here, in the hiving of a swarm. The tiny brains of the bees are, in a matter of a few moments, totally reprogrammed. An empty hive, which until then meant nothing to them, now becomes their home, which they will defend with their lives from that moment on. This hive is all at once the center of their universe, and they will learn to return straight to it from miles around. The hive they have abandoned, which was the center of their universe until perhaps an hour ago, suddenly becomes a thing of indifference, and they will never go back to it even if it is but a few feet away. Indeed, if that hive is filled with honey, and a dearth of nectar settles in, so that they are now threatened with starvation in their new hive, then they will not normally try to plunder the hive they have abandoned, even though the abundant honey still stored there is the fruit of their own labor. The new orientation, their new destiny, is fixed, at whatever cost. BC

AN ALL OCCASION BEEKEEPING TOOL

Robert Alten

Twenty-seven years ago, I started beekeeping. The first year told me there must be a better way to catch "out-of-reach" swarms besides using a ladder and risking serious injury.

I designed and built a vacuum/blower, powered by a four-stroke, three-horse air-cooled engine mounted on tricycle-type wheels for easy mobility. At very low rpm, I can get all the vacuum I need to capture a swarm, and I never injure a bee or the queen. I regulate the flow of air by the engine rpm.

I have taken bees out of very difficult places with the greatest of ease. Many times I have taken swarms out of trees as high as 20 feet up.

You wonder how I come by that dimension? You see the hand-held, very light swarm catcher enables me to use eight or more two-foot lightweight extensions. They are smooth inside; therefore the bees do not stick to the sides causing a "hang-up." The catcher and the extension can be held in the vertical position directly under the swarm.

The Plexiglass sides allow me to see exactly what is going on inside the catcher. The bees are never injured because they land on a strip of burlap which is a very good cushion.

I use one flexible hose between the vacuum and the catcher, and if conditions require it, I can use many more without affecting the vacuum pressure.

To give you an idea of how efficient it is, I set the vacuum on the ground outside a two-story home, ran enough flexible hose in a second-story window to reach an inner wall, and removed the bees with the flexible hose attached to the rear of the catcher with a 14-inch nozzle on the front end.

After the bees are caged and put in a hive, nine times out of 10, at your first inspection, you discover there is no queen, or else the queen has been superceded.

Now some of you are wondering how I know if I have the queen! Very simple: The catcher has two screened sides. The bees that I don't capture will cling to the cage where "Mother" is.

I have six of these cages. One pair of Plexiglas sides will fit all of the catchers. These create the vacuum. If I forget to remove the Plexiglas sides the bees will not suffocate because of a two-inch screened opening at the rear of the cage.

There are ways to make up nucs by shaking, lifting frames from the hives, and taking a chance of not seeing the queen, or my easy way. I pull the vacuum behind me with the catcher in the other hand. I lift the hive cover from the rear and usually, depending on the colony, there are a lot of loafers on the inner cover. These loafers are easy to catch. I go to the next hive and the next; I know what you are thinking – on the contrary – these bees are very content. I take bees from five or six hives for each nuc and watch them through the Plexiglas sides. It seems the only thing they want to do is cluster on the burlap strip and on the top of the catcher.

I take them home, feed them, and keep them overnight. The next day I take them out to one of my yards, sometimes back to the yard they come from, and set the catcher on a nuc or hive body with either foundation or drawn comb and a caged queen.

The catcher has a sliding aluminum bottom (three-hundredths of an inch thick). It is designed in such a way that it does not kill the bees when it is removed. A gentle shake removes the cluster from the catcher.

No hostility among the bees leads me to believe that the flow of air through the cage keeps them calm, and there are always a few of them doing their "fanning ritual" standing on the cage floor. Maybe this "fanning ritual" keeps them quieted down.

When Summer is in full swing and a good nectar flow is in process, there are beautiful "beards" on the strong colonies. This is when I get the urge to start some "nucs." It is so easy. I just position the vacuum beside a hive sporting a large beard, reach around the front of the hive with the catcher, and in about two minutes I have as many bees as I want to start a nuc. There is absolutely no confusion among the bees.

Contined on Next Page

TOOL ... Cont. From Pg. 35

Due to the vertical engine being mounted on coil springs, this eliminates all vibration.

Enough about the vacuum.

When it comes time to take the honey off, I place an escape screen under each super, and when I go back later, the burr comb is nice and dry, eliminating a sticky mess. (There are always a few bees that won't leave the super.) I secure the blower next to the tailgate in the corner of the pickup truck, then lift the super off the hive, set it on end on the tailgate, raise the rpm just a little, and believe me, that three-horse really creates a hurricane.

Sounds easy, doesn't it? It really is. On occasion there are a few bees that hide to escape the hurricane's force, so I remedy this by placing a double screen under the super and one on top. This keeps the robbers out while I'm working on another super. I stack the supers three or four high with a screen on top and one on the bottom. Before I leave the yard I remove the screens from the top as there are always a few bees that want to go back to Mother. I don't take my bees home; they belong in the beeyard.

Beekeeping can be a very pleasurable pastime, or you can make it the exact opposite. I keep my yards well-mowed and trim around each hive by hand.

A friend of mine asked to see one of my yards, and as we drove to one location, he said, "This is nice," and I answered him, "Yes, almost heaven." BC

Setting Up A Nuc Shop

Michael Meyer

In Part I of this series on setting up a nuc operation (see *Bee Culture*, March '98 issue) we looked at a theoretical 50-colony operation and explored many issues regarding setting up a local nuc operation for this size beekeeper. This installment examines the actual nuts and bolts of the operational phase for a complete cycle of a beekeeping calendar year. Keep in mind that the techniques discussed here will work for beekeepers with a couple dozen to several hundred hives with only slight modifications in numbers of nucs and equipment needed. The timing, however, will be a constant and not a variable in this part of the operation. I am going to assume that the beekeeper reading this has several years' experience, is well-acquainted with all the nuances involved in making nucs, and knows how to raise queens from start to finish, although a satisfactory but less profitable operation can be maintained using queens purchased through the normal bee supply channels.

Inside, each is divided into two small nucs, each covered with canvas.

We must pick a time in the bee year to begin our look at the nuc operation, so I'll start in the Summer management phase and explore the overwintering of nucs as an excellent place to begin. Somewhere in the middle of the honey flow it becomes imperative to start your nucs for next year. Colonies which are behind on the honey flow for whatever reasons make excellent choices for 'nuc candidates.' One technique which greatly simplifies the life of the 'nuc maker' and which results in higher honey production and better nucs is to do a 'day move.' Here's how this technique works.

Let's say you have five beeyards with 10 hives each. First, identify the three worst hives in each yard, so you have five times three or 15 hives out of 50 which will get 'nuc'd' instead of making honey. Have a sixth location, without bees, ready, then simply reduce the identified hives to a manageable height, say two boxes, and move these hives during the day to the new yard. You may have to screen or net these hives, but you'll be amazed at how easy they move compared to night moves. In the original yards, distribute the supers among the remaining hives. Don't worry about the field force – they'll find a home in one of the hives, and since this is done during a honey flow, very little fighting will occur. These old field bees will make you quite a bit of extra honey in the original yard. But enough about the honey yard. What you're concerned with is the new yard with 15 or so disoriented (temporarily) hives.

At this point you should be ready to make nucs. This means that

The double entrance floor board.

nuc boxes are brought to this beeyard, hereafter referred to as the 'nuc yard,' and that you have queen cells emerging in a few days or have caged queens arriving or in a queen bank.

Nucs can be made in the traditional fashion or with the "Cook Method," described here: Arrange 15 or so hives, in two groups with hive entrances facing in all compass directions and some distance between the two groups as you bring the hives into the nuc yard – not after. Decide on a standard for each nuc, say two frames of brood and one frame honey or three frames brood and one frame honey per nuc. This standard is very important, as we shall soon see. On the day of nuc making, quickly move all hives in the group into a circle with the entrances facing in. Confusion will reign, but ignore the circling bees. In front of

Finished Nucs showing 1 entrance/side, plus better handles.

each hive place three or four nuc boxes and remove lids. Then simply start filling the nuc boxes with brood and bees from the original hives, removing the hives to your truck as they are emptied. Scatter the brood among the many nucs with no pattern except to get each one to your predetermined standard. When you are all done, arrange the boxes more or less evenly around the circle you've just made, and introduce queens or cells within a day or two if possible. Outside feeding can be started if the honey flow is not strong enough. Your standard should be influenced by 1) time left until honey flow is over; 2) likelihood of a Fall flow; 3) general weather trends. You'll want these nucs going into Winter bursting at the seams with bees, so try to time your nuc making with this general thought in mind. If you wait too long, until the Summer flow is ending or has ended, you'll find you have major problems with robbing activity and with queen acceptance, so do this during the Summer flow.

Check these nucs in a while for queen acceptance. You should have plenty of drones this time of year and great mating weather, so the cells you raised (if you went this route) should be real nice. Queens in the original 'nuc'd' colonies should have been located and removed (or caged and saved for requeening purposes if they were young queens) as you were making nucs. They will just interfere with your acceptance process. Except for routine feeding as the honey flow tapers off, these nucs should be maintenance-free. Treat for mites and AFB and reduce entrances as day temps cool or if robbing behavior is noticed.

In my own operation (1,000 colonies at Summer's peak) I run all 'duplexes,' that is, single hive bodies modified into two four-frame nucs with opposing entrances, for my nucs. Nucs Winter wonderfully in these units, as do small Fall hives, and build very rapidly in the Spring. A special bottomboard, plus a separator board and a piece of canvas are all that is necessary to create these duplex four-frame nucs from old or new hive bodies. Migratory beekeepers have used them for years, and I strongly recommend these over single nuc boxes, but just about anything will work.

Wintering these nucs in the duplexes is rather straightforward. They will Winter anywhere a single or double hive will. Reduce entrances and put in good Winter yards. Make sure each is very heavy. Sometimes the outside frame, if not full, can be replaced with a good, full frame of honey. A division board feeder can be inserted and each nuc fed one to two gallons of a thick syrup if necessary; then the feeder can be removed and replaced with a full frame of honey.

Also during the Winter you can work on ads for next Spring and decide your nuc sizes, plus other details such as discounts for larger orders, due dates for Spring queens and getting these ordered, plus other customer-relation type stuff.

Spring will find you plenty busy. Your overwintered colonies need to be nuc'd a few days before your queens arrive, or in the case of horrible weather, the queens need to be banked until the weather breaks. Do you have modified frames or other holders for your queen bank?

Continued on Next Page

NUC SHOP ... Cont. From Pg. 39

Do you know how to bank queens so they'll last for weeks without loss? If not, get this part of your operation in order by asking an experienced bee man.

As you are making nucs from your colonies (replacement frames should have been readied long ago), keep in mind that the larger you make the original nuc, the less likely it is that the nuc will accept the queen you give it. For the best success, it's better to make smaller nucs and boost them with bees and brood at a later date. You'll also have better nuc results if you move the nucs to a separate 'nuc yard' several miles away. A good rule of thumb is to make nucs for two to three hours max, then move these to the nuc yard. Keep the completed nucs plugged with screens or grass and in the shade. Stoppered nucs can overheat very easily. For caged queens, introduce within a few to 48 hours, but leave alone for seven to 10 days after introduction. You can feed outside (six feeders in a duplex nuc box works great) and this will help on queen acceptance. Another beekeeper rule of thumb is that a nuc made with a good frame of honey will rarely starve.

You need to keep an eye on your overwintered nucs at this point. Entrances should be opened up, and ones that are crowded should be lightly nuc'd (one frame out per nuc) or transferred to singles for later nuc'ing. Or, these can be sold for a premium price as early nucs. Be sure to tell the customer that the queens were late-Summer queens and should perform as well as this year's queens.

Customers' empty boxes (many will bring singles) should be brought to the nuc yard in anticipation of transferring the nucs. Nucs should be examined for a good laying queen, and brood leveled to bring all to a standard size. Brood can also be brought in from other colonies or nucs for this purpose. A good trick for uniting strange bees at this point is to use a light syrup in a squirt bottle. This syrup is more effective with a flavor such as peppermint or vanilla added to it. Simply spray the bees adhering to a frame of brood and put it into the nuc. Very little fighting will occur. As your nucs reach the right size, they should be transferred into your customers' equipment (have them put their name and phone number on their box) with as little disturbance as possible. If you spend a lot of time looking for the queen or general brood pattern as you transfer these, you'll just get a bunch of supersedures and a lot of complaints from your customers.

If you have a locked bee yard, you could bring your customers right out to the yard, but otherwise you'll have to move their equipment to a convenient pickup point, whether at your house or at a closer beeyard. At this point, if you have queen cells started and about to emerge or if you have more caged queens arriving, you can nuc your colonies again, but another nuc taken at this point may seriously hinder your honey flow, so use cautionary judgment. Nucs that had been transferred to singles can also be nuc'd at this point, but their honey production may be hampered.

Shortly after this point in time, have your Summer nuc boxes and queen cell raising operation ready for the Summer nucs described at the beginning of this article and get ready to begin another cycle in your nuc operation. From all the information presented, you can see that to do all this in a timely fashion takes much preparation in the slow season, especially building frames and nuc boxes and having queens ordered for the right time. If you are an eternal procrastinator, this nuc operation will be your undoing, as you'll have a bunch of dissatisfied customers and have burned much midnight oil. If, however, you are organized and a planner, you'll find this nuc operation to your liking and a source of guaranteed income and swarm prevention each year. There's a lot of material in these two articles. Save them for future reference, and may God bless your nuc operation in the future. BC

Michael Meyer is a commercial beekeeper, who doesn't procrastinate, from Springfield, MO.

MAKE THIS BROOD TRANSFER BOX

Roy Hendrickson

Removing excess brood and bees from over-populous colonies is an integral part of Spring management. Whether it is used to boost weak colonies, restart deadouts, or for increase, excess brood in early Spring is a beekeeper's most valued commodity. The most efficient use of the brood and bees occurs when it is moved to another location. This prevents the older field bees from returning to the old stand, and allowing the brood to chill and die.

After several years of experimenting with different methods of moving brood I settled on the brood transfer box. This box is nothing more than a standard hive body with

the long sides extended down 2½ inches. A plywood bottom with one inch runners and a hinged three-quarter-inch plywood lid complete the assembly. Both ends of the extended bottom are screened with #8 mesh hardware cloth. Inside, the box is fitted with nine-frame frame spacers to keep the brood frames from sliding and crushing bees during transit. Western style hand grips are added to aid in handling and transport.

In use this system is simple and versatile. First, estimate the amount of brood to be moved. Then load the required number of transfer boxes with the necessary empty combs, frames of foundation, or frames of honey. Whatever will be needed to replace the brood frames being removed should be included. Starting with an empty transfer box, fill with brood and replace the brood frames with frames from another box. When the first box is full of brood another will be empty. When all the boxes are full or all the colonies have been worked, transport the brood to another location and reverse the process. In addition to moving brood and adhering bees the box can also be used to move large numbers of excess bees. From those colonies with an over abundant field force shake several extra frames of bees into the box. Leave a couple of frames out while shaking, then replace. Or, if the weather is hot leave a frame out along each side for additional clustering space. The increased depth and screening of the box will allow for adequate ventilation to prevent overheating. It is not uncommon to shake five pounds or more of excess bees into each box. When the process is reversed and the brood is being distributed all those extra bees will pay many dividends.

In cases where inclement weather halts the work the brood can be held overnight, or even for a couple of days without problem, provided the frames contain enough honey and extra water is supplied. Under longer term storage conditions the bees will remain quietest if kept in a cool dark room. BC

Roy Hendrickson is a commercial operatior, who has made several contributions, from Willioughby, OH.

MAKE YOUR OWN 5 FRAMER

Keith Rawlinson

One of the most useful pieces of beekeeping equipment I have is my five-frame nuc box. I use it every season for such things as making splits, capturing swarms, and queen rearing. It can function as a temporary stand-alone hive when needed, and allows the frames to be pulled out easily and placed into full-size equipment at my leisure. When I first started beekeeping a few years ago, I realized very quickly how useful a five-frame nuc box would be, but I just could not seem to find plans to build one. As a result, I ended up designing and building my own.

My nuc box is simple, sturdy, durable, lightweight, has an attached bottomboard and a one-inch entrance to accept an entrance feeder. It's made from only 13 pieces which are cut from a 12-foot length of 1 x 12 pine, and is put together with 1-½-inch 4d galvanized box nails and waterproof wood glue or construction adhesive. Simple butt joints are used, thus, cutting the pieces and fastening them together is fairly easy. Use a table or radial arm saw, but a hand-held circular saw can also be used. Save all the scrap since it is used to make some of the smaller pieces of the nuc box.

Start by cutting the two side pieces shown as E in Figures 1 and 2. First, crosscut two 20-inch lengths from the 1 x 12 board, then rip each piece to 11-1/8 inches wide and set them aside.

Next, cut the pieces for the front, back and bottom. The front is shown as G in Figure 1, the back is shown as I in Figure 2, and the bottom is shown as H in Figure 1. To make these pieces, start by crosscutting a 41-¾-inch length of 1 x 12, then ripping this piece to 7-¼ inches wide. From this 41-¾ x 7-¼ board cut a piece 21 inches long, a piece 11-1/8 inches long, and a piece 9-3/8 inches long. The shorter piece is the front (part G), the longer is the bottom (part H), and the third piece is the back (part I).

The front and back will need to have a rabbet cut into one end for the frame rests as shown in Figure 3. Be sure to use the ¾-inch dimension shown in Figure 3 if you will be using the kick-up style metal frame rests, or the 5/8-inch dimension if you will be using 90-degree metal rests or no metal rests at all. Rip the 41-¾-inch pieces of scrap exactly down the center and save these two pieces to make the rim for the outer cover.

To make the outer cover, start with part A in Figure 1. Cut a piece of 1 x 12 to 22-¼ inches long, then rip it to 10-¾ inches wide.

The rim for the outer cover consists of two pieces shown as B in Figure 1, and two pieces shown as C in Figure 1. Part B is 20-¾ inches long and 1-¾ inches to 2 inches wide. Part C is 10-¾ inches long and also 1-¾ inches to 2 inches wide. Both of these pieces can be cut from the scrap left over from cutting the front, back and bottom pieces. Make sure that parts B and C are all the same final width.

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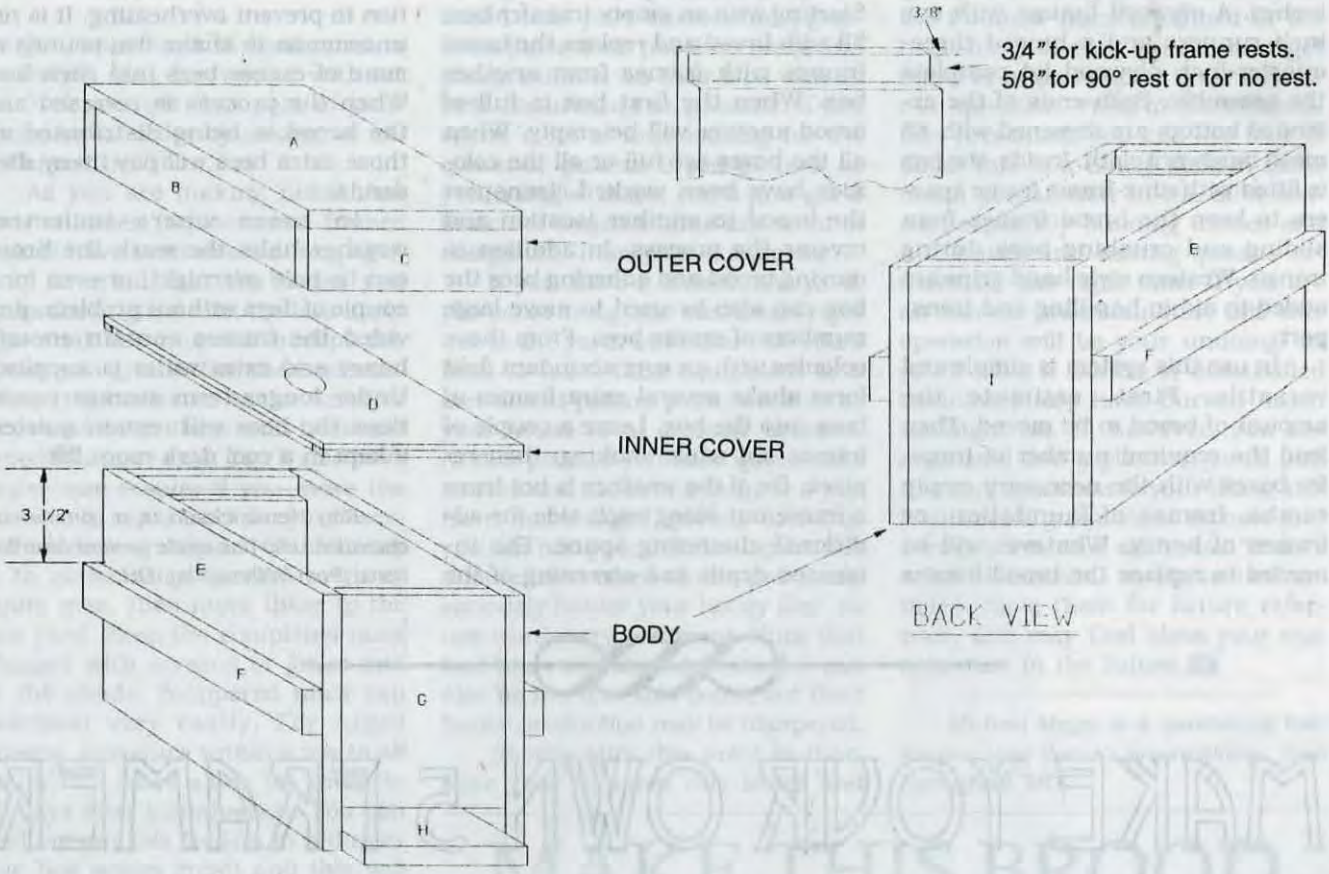


The inner cover is made by ripping the remaining 1 x 12 board to 8¾" wide, then cutting a 20" length. This is shown as D. A 1½" diameter hole can made in the center of the inner cover if preferred. The handhold cleats shown as part F are each 20" long, and approximately 1¾" wide. They can be cut from the remaining scrap pieces.

When assembling use waterproof wood glue or construction adhesive on each joint before it is nailed. You can drill pilot holes to prevent splitting, but it isn't usually necessary.

Start by assembling the rim for the outer cover, which consists of two each of parts B and C. Put glue on both ends of parts B – remember, there are two of these. Then nail part C to the ends of part B. Be very sure that part B butts into part C and not the other way around; otherwise, the outer cover dimensions will not be correct. Now, attach part A to the rim as shown, using glue and nails. Match the rim to the edges of part A as best you can during nailing and set aside for the glue to cure.

For the inner cover, part D, a ¼" rim can be added to one side as shown. This would make the inner cover reversible, but it is in no way necessary. Otherwise, the inner cover needs no further assembly.

Now for the body itself. Start by gluing and nailing parts F, the handhold cleats, to both parts E as shown. The top edge of each cleat should be about 3½" down from what will be the top edge of the body.

Next glue and nail both parts E to the back, part I. Be sure that parts E overlap the ends of part I and that the frame rest rabbet is on the inside and at the top of the body.

Next, apply glue to three edges of the bottom, part H, and slide it in between the two sides E until it stops by butting up against part I, which is the back. Part H will extend past parts E at the front of the body in order to form the landing board. Then nail part H into place.

Finish by gluing and nailing the front, part G, between parts E as shown. Be sure that the frame rest rabbet is on the inside and at the top of the body, and that the top edge of part G is lined up with the top edges for parts E. This will leave a 1-inch opening above the landing board to serve as the entrance.

After 24 hours you can paint. Be sure to apply a generous amount of paint to any exposed end grain, and to the joints to make sure everything is sealed and watertight. Use at least two coats.

I have a full set of detailed plans for this five-frame nuc box, a four-frame nuc box, and a simplified full-size hive including deep and shallow supers, bottomboard and covers. I will send a set for $3. (copying, postage and handling) Send check or money order to: Keith Rawlinson, Box 152, Nova, OH 44859. BC

Keith Rawlinson is a sideline beekeeper and woodworker from Nova, OH.

COMB HONEY

A New Voice, 30 Years Experience – From The North

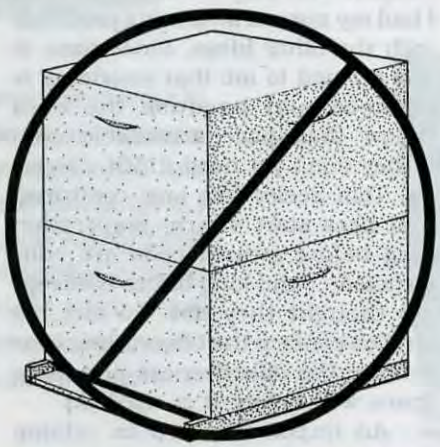
Lloyd Spear

Thirty years ago I decided I wanted to learn beekeeping and contacted my local agricultural extension service for advice on where to buy a beehive. They referred me to a grand beekeeper who was kind enough to sell me two hives. Sensing that I had no idea what I was getting into, he advised me to raise comb honey. He said, "If you raise comb honey, you will learn a lot about bees and beekeeping and will not have to spend money on extracting equipment. You will always be able to sell everything you produce, and will avoid the hard work and expense of extracting honey. Leave the extraction for the big guys who can afford the investment."

I followed his advice, and for the past 30 years, I have produced nothing but comb honey. Through reading magazines and books, discussions with other beekeepers, and trial and error, I have developed a procedure involving relatively little effort to produce beautiful comb honey.

I live near Albany, New York. We are approximately 150 miles from the ocean and not near any major body of water to temper our Winters. While our snowfall only averages 30 inches a year, bees cannot forage for five months (November-March), and do little foraging in October and April. We usually have at least one entire week when daytime temperatures never get above 10°, and have had Winters when we got three consecutive weeks of such temperatures. We often have nights of -20°.

We generally get our first frost about October 1, dandelions bloom around May 15, and our safe planting date for tomatoes is June 1. If you wish to try the methods I outline, you should adjust your timing to reflect the dates of these occurrences where you live. Producing quality comb honey requires maintaining a relatively small brood nest to force the bees into the supers, managing the brood nest to control swarming, and preventing the queen from laying in the comb honey supers. Management of these three key areas is closely related, as the relatively small brood nest can induce the bees to swarm, and the queen's natural tendency is to expand her brood nest upward, which is where the comb honey supers are.



Most of the advice for producing comb honey starts with the assumption that bees are kept in two-story deep hives (9-5/8 inches) for the Winter. Spring management starts with advice for reversing the hive bodies early in the year and then reducing the colony to one story when the flow starts. Reversing is a lot of heavy work, and the sudden reduction to one story either leads to swarming conditions or requires more manipulation to open the brood nest. My procedure is to keep the bees in a single deep, plus a 6-5/8-inch (western) super. I call this a story and a half (1-1/2). Moreover, and this is very important, the 6-5/8-inch super is kept on the bottom and never reversed. In evaluating this procedure, it is important to think about the purpose of the hive bodies below the honey-storing supers.

The hive bodies are where the bees raise their brood and gradually store honey to sustain themselves through the Winter. Thus, there needs to be sufficient comb space for both functions, without excess that will lead to unnecessary manipulation. In this area of the country, 60 pounds of capped honey will take bees through the worst Winters. (In the northern parts of Maine, Vermont, New York, Michigan and Wisconsin, as well as the Dakotas, Minnesota and Montana, bees need approximately 100 pounds of honey for the Winter.) As a 9-5/8-inch hive body with 10 frames will hold about 80 pounds of honey, there is plenty of storage room for our Winters. For brood rearing, it is important to have 10 (not nine) frames. The queen will not normally lay in the two end frames, as they will be filled with honey. In a 10-frame hive, that leaves eight frames for brood. If there are only nine frames in the hive, those on the ends will still be used for honey, leaving only seven frames for brood. That is a reduction of over 12 percent compared to a 10-frame hive.

So, we need a 9-5/8-inch hive body for Winter storage and brood, but why do we also need a 6-5/8-inch super underneath? Old-time beekeepers (does that include me?) know of the use of slotted racks for

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"On about May 15 I usually make my first hive manipulation and inspection. (Those who Winter in two-deeps will have already reversed their hives at least once. and probably twice.) The bees will not yet be working the supers, and I just set them aside, which is the same thing I'd do if they were partially filled with dandelion honey."

northern beekeeping. These provide clustering space and, more important, induce the bees to keep good brood comb right to the bottom of the frames. Without slotted racks, the bees chew away at the wax at the bottom of the frames, sacrificing space that is needed for both honey storage and brood. The 6-5/8-inch super on the bottom works just like a slotted rack for the deep hive body and, in late August and September, provides a space for the queen to move when the deep gets almost plugged with honey. Thus, the hive configuration of 1-1/2 stories provides plenty of space for brood and Winter stores and eliminates the slotted rack as a piece of equipment. As we will see, it also has other advantages.

Start In March

My honey-producing year starts in March, usually around March 8 when I can at least walk into the yards. As a rule, this trip is very fast. I lift the cover, use a tiny amount of smoke, and put in Apistan®. Since I use only one deep, the cluster is right up on top. I put a terra patty on the top bars, and close the hive. Unless I get some 60° days, I leave the bees until May. If I were using two deeps, the brood would almost certainly be in both, requiring lifting or tilting the top deep, additional Apistan®, and more disturbance of the bees.

On May 1, or the soonest day without rain after that, I go back to the hives, scrape off the Terra patties, replace with plain grease patties, and put two supers on. The super closest to the brood nest always contains Ross Round™ circular sections. (I will come back to the "why" of this.) The upper super is either a cut comb super or another Ross Round™ super. I don't have a good dandelion flow, so my first flow is from black locust on June 1. However, the purpose of adding the supers on May 1 is not to capture a flow, but to give the bees a lot of room. For my first several years of beekeeping, I followed the advice of not providing comb supers until I saw white comb being built just below the top bars. I also had a lot of swarming. One year something crazy happened, and I had some supers ready early and put them on some of my hives on May 1. I was still preparing supers, so most hives had to wait until I saw comb being built. To my surprise, none of the hives that I supered on May 1 swarmed, while I had my normal swarming problems with the other hives. Since then, it has seemed to me that swarming is reduced just because the bees "know" that space is available, even if they don't yet need it! (Of course, Dr. Tom Seeley has now confirmed that bees start swarm preparation long before swarm cells are constructed ... and long before beekeepers thought they did. To me, his studies confirm the observation concerning the effectiveness of adding space well before it is needed.)

An important step in raising comb honey has just been intentionally missed. That is, putting a queen excluder on top of the brood nest to prevent the queen from laying eggs in the comb honey. Well, I've used, and own, lots of queen excluders. The first time I raised comb honey, the queen laid eggs in the first super. I was told, "You put the super on too soon; wait until you see comb starting to be built along the top bars of the brood nest." I did that the next year, and the hive swarmed. Then I was told, "Put on a queen excluder and put the supers on early." I did that, and the hive swarmed. Then (this is the third year, for those who haven't been counting) I was told, "Put your supers on early, wait until the bees have half filled the first super (even if the queen is laying in it), chase the queen down into the brood nest (not an easy matter for a beginner), then put on the excluder." Fine, that works. One gets one or two supers of comb honey untouched by the queen. With brood above, the bees will readily move through the excluder. As the brood hatches, the bees fill the cells with honey (and pollen), and they are conditioned to move through the excluder and readily draw and fill the supers above. But, without an extractor, what does one do with the super in which brood was raised and there is still pollen? (I left it outside to be robbed and then reused it the next year.)

To me, using excluders is never easy. While I know that others have methods and timing that make it easy for them, I have never mastered the technique. But there is a better way. When Ross Round™ circular sections became readily available in the mid-1970s, I quickly tried them. There are lots of good reasons to use Ross Rounds™, and one is that, in 20 plus years, I've never known a queen to lay in them. The space provided is confined and somewhat complicated. I have no doubt that queens go "up there," but they quickly go down ... at least they have never laid eggs in one of mine. I believe this experience is universal. The great comb honey producer, Gene Killion, taught me to "put the cut comb super over the Ross Round™ super. By the time the bees have the Ross Round™ super three-quarters or so filled, they have also built a 2-inch barrier of honey on the top of the brood nest. The queen will not cross that barrier to lay in the cut comb super." After hearing that I understood the significance of the advice "don't put the supers on until you see wax being built on the top of the brood nest." The presumption was that by the time bees were building wax, they had also constructed a honey barrier. Unfortunately, that is not always true. I've seen them build wax on top of the brood nest well before the honey barrier is there. But Killion's advice works and, as far as I know, is the

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TINY SECTIONS

Rick Green

The conditions are said to be right for producing section honey when the bees are kept on the verge of swarming. While this produces small, beautiful white sections, it also produces more swarms despite intensive management. Another drawback of current production methods is the need for expensive containers and special equipment. I have found a nice alternative – inexpensive miniframes that look natural; with no added risk of swarming; and packaged quickly and inexpensively in ziplock plastic bags.

While I have switched to plastic frames elsewhere in my operation, I use standard deep wooden frames to make the miniframes. I cut the top and bottom bars in half and with a few more cuts duplicate the notched ends. Next, I assemble these half-size frames in the usual way and add a piece of foundation. Wiring, gluing and extensive nailing are not needed. To a standard hive body I add a board across the middle with a groove on each side to hang 20 miniframes, instead of the usual 10 full-size frames.

The bees readily accept this arrangement. I remove the miniframes that are newly capped with white wax and put undrawn frames in their place. I also move the end frames toward the middle so that all sides are equally drawn. The completed deep miniframes weigh about three pounds and fit nicely in one-gallon baggies. Medium- and shallow-depth frames could be made just as easily.

Sales are good. For transport and display I hang the miniframes in an empty standard hive body by temporarily tacking parallel strips of wood on top. My best outlets have been farmer's markets and health food stores.

Try it. No special equipment is needed and the bees tend not to swarm. The result is a new product that sells at a premium price. BC

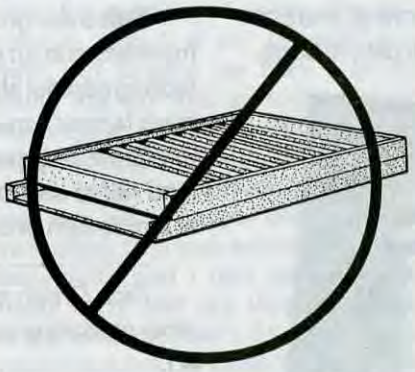
Rick Green makes these comb honey sections, and other marketing innovations from his home in Ballston lake, NY.

COMB HONEY ... Cont. From Pg. 44

most simple way to guarantee that the queen will not lay in the cut comb super.

On about May 15 I usually make my first hive manipulation and inspection. (Those who winter in two-deeps will have already reversed their hives at least once, and probably twice.) The bees will not yet be working the supers, and I just set them aside, which is the same thing I'd do if they were partially filled with dandelion honey. If I don't expect to get back to the yard in time, I pull the Apistan®. Otherwise, I leave it in until the required time, just before the black locust flow on June 1. The real purpose of this mid-May trip is to scrape the bottomboards (if necessary), inspect the brood, and make splits. I use Carniolan queens because they go into the Winter with small clusters and build up very fast in the Spring. To me, the only downside of this race of bees is that they build up so fast that they will swarm if the brood nest gets at all crowded. I look at the size of the brood nest and leave the bees with just two combs of sealed brood and all the unsealed brood. I take any other frames of sealed brood for splits. Sometimes that means I will take four frames of sealed brood, but it's usually two or three. If the hive has more than the two end frames full with sealed honey, I will take those as well. All frames taken are replaced with drawn frames if they are available. Otherwise, I replace them with foundation. All of this is very fast and easy, as I only have to worry about the single deep. This frees up the brood nest and, together with the two empty supers, gives both the queen and the bees lots of room.

If I come across a hive that doesn't have at least two frames of sealed brood, I give the queen the "hive tool test." If she fails, I take all the frames from that hive and use them for splits or to replace those I have taken from other hives. This keeps my yards with nothing but productive hives and provides enormous building power to the splits. A few days after the black locust starts to bloom (early June) I go back to my yards again. Four of five years the black locust fails, either because of 90° temperatures or a thunderstorm that knocks the blossoms from the trees. However, this crop is so important that I want to always be ready to collect it. On this trip I start by prying up the top super (either the cut comb super or the second Ross Round™ super) and looking down into the super above the brood nest. If it is being filled I close up the hive and walk away without using smoke. Around here, only black locust is blooming at that time, and I don't want to disturb the brief flow. If the supers are not being worked, I again go into the brood nest and remove all but two frames of sealed brood, and replace with foundation or drawn comb. Most years I will give



any brood removed to the splits I made up the first time. Some years I will make more splits.

If I lose the black locust flow, the supers start being filled around June 15, principally from chokecherry, but also from raspberries and blackberries. If I've not already done so, I go back into the hives looking for more excessive sealed brood to remove. The real flow starts on July 1 with linden (basswood), so the bees necessary to collect this flow have already hatched, and removing the brood does not reduce the number of foragers available. Some years honeysuckle yields nectar, sumac always helps, and in dry years farmers don't bother with the second cut of alfalfa and those blooms provide a good yield. My supers start coming off around July 15 and, except for one yard, all my supers are off by August 15.

One yard is located near a large stand of purple loosestrife. This starts blooming around August 8 and lasts for three weeks. To me, the honey and cappings are beautiful and the honey has a fine taste. Others find the taste (or the consistency?) oily. Perhaps either my honey or that of others is combined with something else coming in at the same time. If I moved hives, which I don't, I'd go to the flows of purple loosestrife.

When the last supers are off, I put in Apistan® again. I do this by yard and usually start around mid-August. By then there is little brood in the top box – usually only four frames, and the rest are packed with honey. I tip the top box forward and use a little smoke to look at the western super on the bottom. Usually there's no brood. If there is, I put a strip in down to the bottomboard and just let the remainder lie on the top bars. If there are four or five frames of brood in the deep I use one strip. If there are six frames, I use two strips. So, by September 1 my production is over. Instead of removing the cappings, extracting, heating, clarifying, and bottling honey, I use a penknife to trim off the edges of the Ross Rounds™ sections, put on covers and labels and sell them. I use a four-inch-square "gizmo" to cut the cut comb sections, drain them, and put them in plastic boxes. I start delivering honey to customers in late July, and by the end of August, better than 75 percent of the crop is gone. By October 1 it is all gone. I only sell wholesale, and last year my Ross Rounds™ 8-ounce sections went for between $2.00-$2.25 each. My 12-ounce cut comb sections go for the same price, but demand isn't nearly as high. The Winter lies ahead, but some hives have been exclusively collecting Winter stores since August 1, and all have been doing so since September 1. The Apistan strips were applied in plenty of time for a good mite kill. By November 1 my Apistan® is out of the hives, and the deeps are too heavy to lift. Time to be thinking about next year. BC

Lloyd Spear is a successful sideline beekeeper. He recently purchased the Ross Rounds Company and knows his product well.

NOT IN ANY BOOK

Young Colonies Can Be Unpredictible . . . . . and Troublesome. Some Thoughts and Solutions.

James E. Tew

Initiating and developing beekeeping skills is much like learning to drive a car. Few people are immediately accomplished drivers simply because they have been through a state licensing procedure. It takes years of time and innumerable instances of risks, bad weather experiences, mechanical problems, and the unpredictable actions of other erratic drivers, before a driver has "seen it all." Many state beekeeping groups are in the enviable situation of currently having large numbers of new beekeepers. A common concern of newer beekeepers is the sense that some seemingly obscure detail will be overlooked and their colonies will suffer because of that oversight. In essence, they are impatiently asking for all of life's beekeeping experiences in short order. Beekeeping expertise – like automobile driving expertise - takes time and discipline. If you have recently installed packages or purchased your first hive, you should be experiencing the enjoyment of watching your new hives develop. The installation of package bees is a popular beekeeping "rite of passage" into the world of experienced beekeeping.

There are abundant sources of information that give beekeepers the correct way to perform various beekeeping tasks. In a perfect world, perfect information would be all the that you should need, but alas problems do arise. Ironically, those instances when things don't go right are more memorable than the unexciting episode when things went exactly right.

One colony persists in being the runt of the litter It's not uncommon for one hive to consistently be smaller than the others. The reasons are not always clear. The problem will probably be caused by drifting bee populations, defective queens, or diseases.

What are the symptoms of a runt? It just does not built up as fast and its population is noticeably smaller than the population of my other colonies. The supers you added when you put supers on all the other colonies have not been used while they have in the others. Upper hive parts are not propolized together allowing the hive parts to slip easily. Flight activity at the entrance is less intense than the activity at your other colonies. In general, the hive is not thriving at a time when it should be.

If bees appear to have drifted away from the weaker colony, its population should be equalized with your other stronger colonies. The weaker colony can be strengthened by adding brood or adult bees (or both) from other colonies. How much to add? It's not a procedure that is not easily quantified.

To add adult bees, select one of your colonies that is approximately 30% stronger than the weaker colony. One warm, clear day when the bees are actively flying, simply swap locations with each colony. The smaller colony gets the larger colony's field force while the smaller field force will return to the larger colony. Giving the colonies a bit of smoke during the move would not hurt. From yet another colony take one or two frames of mostly capped brood and donate to the weaker colony. In just a matter of minutes, the weaker colony will be dramatically stronger – both in brood and adult bee populations. It would not be a bad idea to recage the weaker colony's queen during this procedure to be certain the new foragers are not too hostile to her.

Everything looked okay for a while, but now I can't find the queen or any eggs Even to experienced beekeepers, this situation can be troublesome. There is a period of time before the new queen begins to lay when there is no sign of a queen and there are no eggs or young brood that the bees could use to raise another queen. Much like a space craft passing on the dark side of the moon, there is a period of time when there is no communication with the craft. In a similar way, the beekeeper must wait for the new queen to mate and to begin to produce eggs and begin to show her presence; therefore, coming out of the period of "queen darkness". Occasionally, you may happen to see the elusive virgin queen, but she is difficult to find. She readily runs and is quick to hide, thus making her presence all the more difficult to determine. This "waiting for the queen to show herself" process

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ANY BOOK ... Cont. From Pg. 47

should not go on much longer than ten days. As an insurance policy, take a frame of eggs and larvae from another colony and place in the middle of the brood nest of the colony in question. Just one day later, the development of emergency queen cells will be obvious if there is no queen within the colony. At that point, you must decide if you are going to order a new queen or let them produce their own. Remember that many weeks will pass before the self-produced queen is producing worker offspring.

Shouldn't these bees be making more honey right now? Nectar flows are classic seasonal events. Some years they hit while in other years they just never really materialize. The biggest reason that a nectar flow happens or does not happen is caused by the weather. Cold and rain does not make for a nectar flow while warm and sunny does. Now that you have these new colonies and the nectar flows are not developing, what should be done? If the colonies have no stores at all, you must feed them heavy syrup* immediately. If the colonies are light, but clearly have a few frames of scattered honey, you may just want to hold on for a while and continue to check them. Ironically, feeding a hungry colony inspires that colony to produce more brood - not to store the food for the future. In a way, the beekeeper has only made things worse. The intensity of the fall flow varies across the U.S. If you are in an area that has a good fall flow from Goldenrod or other fall flowers, you might just consider waiting until then to see if your colonies can put aside enough food to pass the winter. But .. you will not have much time to feed your colonies if winter comes on fast once the fall season has begun. Give it your best guess.

Why won't they take the syrup? Now that you have decided that you need to feed, you are finding that a few of your colonies just won't take the syrup while other are sucking it down faster than you can put it on. What else can happen, you wonder? Two things are possibly at play here. Either there is a natural flow on or the colonies in question are not learning to use the particular style feeder you are using. You can tell the presence of a nectar flow by the presence of fresh nectar dripping on your shoes when you hold a frame sideways or by new white wax being produced throughout the colony. Most colonies will prefer to forage naturally rather than to take sugar syrup from a feeder. Not seeing those new wax features within the colony and not seeing an abundance of flowering plants in your community, you would probably then select the second common cause for not taking syrup - the bees are not using the feeder.

The Boardman Feeder (the entrance feeder) is commonly the feeder of choice for the new beekeeper, but it is not always readily accepted by the bees that are having to travel to the front of the colony to get the syrup. Consider removing the feeder jar from the Boardman feeder at the entrance and putting the jar over inner cover hand hole. Then put an empty super around jar and close the colony up. Bees tend to find and consume the syrup faster from such a feeder more quickly, but it won't be as convenient for the beekeeper.

During times of feeding, some beekeepers drill holes in plywood boards cut to the size of the brood chamber thereby improvising a flat board cover with a hole cut in it. The feeder jar then just sits on top of the colony. When do you stop feeding? When the colony stops taking it or when you just get sick of doing it are probably the two most honest answers. In reality, you should stop feeding when the colony appears to have a two to five frames of processed syrup. All the sugar feed is really suppose to do is to get the light colony through a rainy spell. Otherwise, you must hope that they can find enough to live from day to day.

This yard is just not working out It frequently happens that a new beekeeper feels that they have the perfect location, but it quickly works out that the location is anything but perfect. What to do? I have to assume that the situation is bad enough that you feel you must move the colonies. The reasons vary wildly. Irate neighbors, irate spouse, an angry Black Angus bull, hives on a steep hillside, too far from the path, too much poison ivy, and bees chasing birds from my bird bath, are all reasons that I have heard for a beekeeper being required to move a yard before it has been in place for one season. Moving colonies is an in-depth discussion all by itself. But, the process of moving colonies is very nearly the same for one colony as for 1000 colonies. Let's say that you have five colonies to move and that the new location is eight miles away.

Close the entrance with aluminum window screening (vinyl screening won't work well) in the early evening on the chosen move day. Though other techniques exist (such as hive staples), for a small number of colonies, five in this case, I would suggest using nylon ratchet straps that can be purchased at home improvement stores. Ratchet the colonies down tight using occasional smoke. Move quickly. Confined colonies can suffocate within minutes.

If at all possible, have a helper present (probably not a spouse) even if the colony is only in a single deep, to help load. Have a good flashlight and maintain a good attitude. Upon arriving at the new location, get the colonies off quickly and open them immediately. Two points that may need more discussion are: upper screening and confining the queen for the move. If the weather is particularly warm (probably anything above 70°F), staple window screening to the top of the colony with both the inner cover and outer cover removed. It would not hurt to put a half pint of water over the screened colony 3 or four times during the move if the bees seem particularly active. Under these conditions, you just about cannot drown them and you certainly cannot chill them. Second, in fairly new colonies, the frames are easily removed and only lightly propolized. That's good for working the colony, but such frames

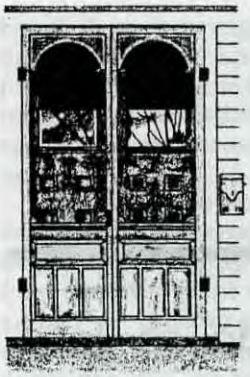
**Heavy syrup is essentially hot tap water with granulated sugar mixed in (about 50/50 by volume). Even better would be heated to nearly boiling with all the sugar the hot water can hold, but this is quite a bit of work.*

will bang around during the move.

It's a good idea to recage the queen for the trip. I would recommend leaving her caged for a day or so after the move in order for the colony to settle down. Too cautious to do the queen recaging thing? Then just take your chances with the queen loose. Drive slowly and grit your teeth often. If possible, place your colonies so the frames align front/rear of the truck. Now, at this point, be prepared to begin to find all the things wrong with this new location, but at least the next time you will have experience moving bees when you have to do it again.

Keeping bee colonies productively and enjoyably is not always about doing things right, but is often about correcting things that went wrong. It's all part of the craft. Ironically, it's the things that go wrong that you remember the longest. BC

James E. Tew is State Specialist in Apiculture, The Ohio State University at Wooster, Ohio.



Ann Harman

Home Harmony

Take A Trip

May is a perfect time to take a trip around the world. You can have your choice of transportation: airplane, cruise ship, two feet, automobile, train, horseback, mountain bike, or – your kitchen. Here you can sample some of the world's cuisine without leaving home. Look at one of the advantages – you won't have to guess what the menu says. Reading a menu in a foreign language can be a challenge, even if you are reasonably fluent in that language.

Finding recipes using honey can also be a challenge. In some countries honey is too precious to be used in ordinary foods. Foods cooked with honey as an ingredient may be only for special holidays. In other countries honey is considered more of a medicine than as a delicious addition to a food. Who wants to cook with a medicine? In still other countries honey is served plain in a small dish to be eaten straight with a spoon. And finally, there are countries where cooks are quite convinced that a recipe cannot be modified to use honey instead of sugar (as in baking bread) – "It won't work." I'm still puzzling over that one.

Nevertheless we can still take our trip and discover some perfectly delicious foods. For this journey you won't need a ticket or even a passport. Let's go.

GREAT BRITAIN – SCONES

Our first stop will be in England where we will have tea and scones in a quaint country cottage. Although the recipe for the scones does not have honey, you will, of course, put butter and honey on them. The recipe, from an unknown British source, was my standard recipe when I lived in England. The scones are quickly made. Serve them warm from the oven so that the butter and honey melt into them. You can put honey in your tea, also, if you wish.

2 cups flour
2 teaspoons sugar
1 teaspoon cream of tartar
1 teaspoon baking soda
1/2 teaspoon salt
1/2 cup butter
3/4 cup milk

Sift dry ingredients together. Cut in butter until mixture is consistency of coarse meal. Stir in milk to make a soft dough. Divide in two portions. Pat out on a lightly floured surface into a round, 3/4-inch thick. Cut across in both directions, making four pie-shaped sections. Place on baking sheet. Bake at 400° for 12 to 15 minutes.

It's easy to get from England to France. You can take a ferry; you can fly; or you can go through the Channel tunnel either by car or by train.

FRANCE – CHICKEN VERONIQUE

Veronique, the irresistible French way with chicken and fish in a wine and grape sauce, achieved its name in a interesting manner. According to culinary legend, the chef who created the dish couldn't decide on a name. When his assistant came to work that day announcing the birth of a daughter, Veronica, the chef decided to name his creation Sole Veronique.

Numerous variations have since been developed, including this version of elegant Chicken Veronique.

2 tablespoons flour
1/2 teaspoon salt
1/2 teaspoon black pepper
1 broiler-fryer, cut into serving pieces
1/4 cup oil
1/2 cup dry white wine
1/3 cup orange juice
2 tablespoons honey
1 tablespoon chopped parsley
2 tablespoons slivered orange peel
1 cup halved seedless white grapes

Combine flour, salt and 1/4 teaspoon pepper; lightly dust chicken pieces. In large skillet brown chicken in the oil. Add wine, orange juice, honey, parsley and remaining 1/4 teaspoon pepper. Cover; simmer over low heat 30 minutes. Stir occasionally. Add orange peel and continue cooking until tender, about 10 to 15 minutes. Remove chicken to serving platter. Add grapes to gravy and cook, stirring constantly, 2 minutes. Pour over chicken. Garnish with grapes and orange slices.

Five Great Cuisines

GERMANY – RED CABBAGE

Take a train now. Or even better, drive on some of the small byroads and head east into...

1 large red cabbage
2 tablespoons butter or margarine
2 cups coarsely chopped onion
1 clove garlic, minced
1 tart green apple, pared, cored and thinly sliced
1/2 cup red wine vinegar
1/4 cup water
1 tablespoon caraway seeds
1/3 cup mild flavored honey

Cut cabbage in wedges and remove core. Chop cabbage into bite-sized pieces. Melt butter in large saucepan. Add onion and garlic. Sauté until wilted. Add cabbage and stir-fry about 5 minutes. Add apple slices, vinegar, water, caraway seeds and honey. Stir gently to mix well. Cover and cook over very low heat 1 to 1-1/4 hours. Makes 8 servings.

Honey With A Foreign Flair
California Honey Advisory Board

SWEDEN – SWEDISH FRUIT SOUP

It's time to head north into Scandinavia where you can enjoy a bowl of this soup at any meal, including breakfast. Furthermore, this soup can be served warm or cold and is delicious either way.

3/4 cup dried apricots
3/4 cup dried prunes
6 cups cold water

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Richard Taylor

Bee Talk

"Keep a record of what you do, so you can do the good things again, and avoid the mistakes."

I was talking with a well-known bee expert the other day who is offering a beekeeping course to beginners, and he remarked on how people who write books and articles about bees are quite unaware of the problems that complete novices face. For example, a beginner is likely to be starting with package bees. He opens the package, removes the syrup can – and the queen, in her cage, falls into the bees. The aspirant beekeeper is helpless. The idea of reaching in among the bees with one's fingers – as any of us would do without thinking – is too terrifying to consider.

This got me thinking about some of the beginners' mistakes that I've seen over the years, plus, I am afraid, some real boners made by those including myself, who are no longer beginners.

For example, a beginner opens the package of bees, and all goes well. She removes the queen in her cage, and reads the directions: "Remove cork from candy end . . ." etc. She removes the cork, and there is no candy in there at all! Omigod! Having no idea what else to do, she recorks the little cage and rushes to a store to buy a bit of chocolate to plug the hole. The reason the queen breeder did not bother to put candy in the cage is that, the queen being in the presence of the other bees for several days, slow release is probably not necessary. But the beginner had no way of knowing that.

I once saw a beginner, having been informed that his package bees were waiting for him at the post office, don his brand-new beesuit and veil before getting into his car to go fetch them. Another beginner, who was starting with a complete hive of bees he had purchased, opened it to find a layer of burr comb filled with larval brood just under the cover, and he imagined maggots of some kind had invaded his hive.

Beginners think that their bees will not survive without lots of feeding, and this once led to my being consulted on the following mystery: The beginner had started two hives and had been feeding them copiously with sugar syrup for several weeks. Both seemed to be doing well, with lots of bees coming and going at both hives, until he opened them and was astounded to find that while one had built up just great and stored a lot of honey (or sugar syrup), the other had no honey at all, almost no brood, very few bees, and a bedraggled looking queen. So he assumed that it must need more sugar syrup. He gave more syrup, checked again after a week or so, and found the same thing. So he gave up on that colony. Several weeks later he looked into it, and behold! It was building up wonderfully – a decent population of bees and a fine brood pattern. How on earth to explain that?

The reader has by this time figured it out. The flourishing colony owed its prosperity to the feeder on the colony that was languishing; in other words, the latter was being robbed out by the other. All those bees he saw coming and going from the weakling were robbers. As soon as he removed that feeder the weakling had a chance to recover, or the robbing bees could now turn their attention to the nectar in the fields. A sugar syrup feeder in an apiary can act like a giant flower gushing with nectar; at least, it can seem like that to the bees.

The most fertile source of beginners' mistakes is failure to understand the very simple principle of the bee space. Beginners invariably put inner covers on with the deep side down, to give the bees ample room to move over the top bars. The result is a lot of sticky burr comb, or they leave out a comb, thinking they can replace it next time they are in the apiary. I once did that – a very long time ago, to be sure. I removed the comb in the morning, and when I went to replace it *that afternoon*, the bees had already started one of their own, suspended from the inner cover, of course.

This principle of the bee space is sometimes disregarded by oldtimers. Usually it doesn't make much difference, but sometimes it does – as when, for example, you pry up a super and the bottom bars of the frames, being glued to the top bars underneath, break and come loose, ripping combs apart in the process. I have even seen commercially manufactured equipment in which the principle was egregiously disregarded, the most serious example being regular, standard comb honey supers sold as suitable for circular sections. The space above the frames is a quarter-inch too large, and it gets filled with burr comb that is filled with honey – an incredibly sticky mess. I've pointed this out to the manufacturer, but he does nothing about it.

Here is the bee space principle: The bees abhor a space in the hive

larger than three-eighths inch, filling it with comb, and they fill with propolis a space less than one-quarter inch. They want just enough space to move around in, no more, no less.

One fertile source of mistakes, even among beekeepers who are not beginners is failure to see things from the bees' point of view. For example, we tend to assume that a colony of bees identifies with its particular hive, as we identify with our houses, but in fact they identify with the *location* of the hive, not with the hive itself. If you put another hive there, they fly right into it, no questions asked. Ignoring this, I once did the following dumb thing: A friend asked me to help him move his hive of bees to another location a mile or so away. But it was so heavy that I proposed that first we move the top story, then come back in a day or two and move the rest. You know what happened: When we moved the bottom stories over we found, of course, that the bees had removed the honey from the story that was there and taken it back where it belonged, that is, to the original location. No wonder the rest of the hive was so heavy when we went to get it! You run the risk of a similar result any time you move honey, with or without bees, from one spot in the apiary to another.

Foundation can give the beginner some unexpected problems, too. For example, you hive a swarm on foundation, and all goes just fine, but an hour later you find the hive empty of bees. That hive was not picked out by the scouts; they have some other site in mind, and the foundation, which we think the bees should just love, is of no interest to them at all. So put a comb of brood in the hive before hiving the swarm. That will make the swarm stay put. Sometimes, of course, the bees will stay, even if there is only foundation in the hive. But if it's a hot day, you might discover, when you open that hive a day or two later, that the foundation has all collapsed from the weight of the swarm – a real mess. Solution: Wire the foundation in good. You get a different problem with foundation if conditions are not good for getting it drawn. For example, if there is no honey flow, and no sugar feeder, then the bees cannot draw the foundation out, so they chew it up. You're apt to get the same result if you expect the bees to draw the foundation out in the bottom story of the hive. Put it up above, where the bees store honey. Of course, the best way of all to get foundation drawn is to give it to a newly hived swarm.

About 50 years ago, when I was getting back into bees after going to war and then back to college, I started keeping notebooks of all my observations, and, all of my mistakes. Two of them got filled up pretty fast. I got them out the other day and, for the first time in years, read them. Two things impressed me; first, my overwhelming enthusiasm, and second, all the mistakes I made. It was a good idea, keeping notes like that and I recommend it to anyone starting out with bees. BC

Richard Taylor is a philosopher and lifelong beekeeper who lives in the Finger Lakes region of New York.

HOME ... Cont. From Pg. 51

1 cinnamon stick
2 lemon slices
1 tart cooking apple
2 tablespoons raisins
1 tablespoon currants
1/2 to 3/4 cup honey, to taste

Soak apricots and prunes 30 minutes in cold water. Add cinnamon stick, lemon slices and bring to a boil. Cover and simmer 10 minutes, stirring occasionally to prevent sticking. Peel and core apple; cut into 1/2-inch thick slices. Add apple slices, raisins, currants and simmer 5 more minutes. Cool slightly and add honey, stirring until well-blended. Remove cinnamon stick. Serve hot or chilled. Make ahead; it can be reheated.

Here, There & Everywhere
ed. by VOCA

RUSSIA – *PORK CHOPS WITH CHERRY SAUCE*

Keep heading east, and after quite a journey you will be in Russia. Pork chops are popular there, but they are usually served with a sauce. If you do not have any cherries, you can substitute plums.

6 pork chops, about 1/2-inch thick
salt, pepper to taste
fine, dry bread crumbs
butter, margarine or oil
water
1 cup pureed, canned sour cherries, pitted
1/2 teaspoon cinnamon
1/2 teaspoon ground cloves
1 teaspoon grated lemon rind
1 tablespoon honey (or a little more to taste)
1/2 cup Madeira wine

Cut any fat from chops. Season with salt and pepper. Roll chops in bread crumbs seasoned with salt and pepper. Brown chops on both sides in the butter or oil. Add 1/2 cup water and cook over low heat, covered, 45 to 60 minutes, or until tender. Meanwhile, combine cherries, honey, cinnamon, cloves, lemon rind and bring to a boil. Lower heat and cook 5 minutes. Add a little water to thin if necessary. Stir in Madeira and remove from heat. Serve over cooked chops.

The Eastern European Cookbook
Kay Shaw Nelson

GREECE – *GREEK SESAME CHEESE PIE*

It's time to head south to a land where honey is a popular ingredient in many dishes.

Sesame crust for a 9-inch pie
1-1/2 cups graham cracker crumbs
1/4 cup sesame seeds
1/4 cup melted butter
1/4 cup honey
1/4 teaspoon salt

Mix with fork and press into 9-inch pie pan. If mixture is too stiff, add a little water.

Filling
2 cups ricotta cheese
2 eggs, separated
1 teaspoon vanilla
1 teaspoon grated lemon rind
2/3 cup honey
2/3 cup half-and-half
3 tablespoons cornstarch

In blender, combine ricotta with egg yolks, vanilla, lemon rind and honey. Add small amount of cream, then blend in the rest with the cornstarch. Beat egg whites and fold ricotta mix into whites until just combined. Pour into crust. Bake at 350° for 50 to 55 minutes. Serve at room temperature.

It's time to return home and unpack suitcases full of souvenirs. Perhaps you acquired sample jars of honey on the way, or even some honey recipes. If you do have honey recipes from foreign lands and would like to share them with others, send them to me and we will take another world tour in our kitchens at a later date. BC

?Do You Know? Answers

1. **True** Nectar is basically phloem sap which has undergone some alteration during the secretory process. Depending on the plant species, xylem sap may be added. The overall sequence includes the unloading of sap from the phloem sieve tubes, passage of the sap from cell to cell through the sub-glandular tissue and into and through the secretory cells, and finally the expulsion of the finished nectar to the outside.
2. **True** Early scientists believed that nectar was simply an 'excretion' of the plant and the nectary was often described as a valve for the release of excess pressure. Nectar secretion, however, appears from the evidence of several studies to be an "active" process, requiring energy built up in respiration and released by the hydrolysis of ATP. Thus nectar secretion is dependent upon the metabolism of the nectary.
3. **False** Atmospheric humidity does not affect nectar secretion directly, but has a pronounced inverse effect on nectar sugar concentration. As nectar is secreted, it undergoes a regulation of concentration until its vapor pressure comes to equilibrium with that of the atmosphere. Unless the humidity of the atmosphere is very high, the change will be a loss of water molecules to the air and an increase in nectar sugar concentration.
4. **True** Nectaries are glands that are specialized for the export of sugars. The conductive tissues that supplies the nectary are phloem (food conducting vessels) and xylem (water conducting vessels).
5. **False** The various events that occur during flowering appear to be coordinated, probably by plant hormones. Nectar secretion begins about the time the flower opens, pollen ripens, and the stigma becomes receptive. As bees visit the flowers to collect the nectar and pollen, their visits usually result in pollination that leads to fertilization. Fertilization in turn seems to activate a feedback mechanism in the flower which switches off nectar secretion.
6. **True** The time of day in which pollen is released is a species characteristic. The degree of synchrony of pollen release among flowers within a species is highly variable and is impacted by temperature. Low temperatures retard pollen ripening and delays anther dehiscence.
7. **True** Wind-pollinated flowers in general produce a greater abundance of pollen than those pollinated by insects. This greater abundance is inversely related to the probability of pollen reaching the stigmatic surface and achieving pollination.
8. **False** While both male and female flowers usually produce nectar, only male flowers produce pollen.
9. **True** Since the sugars contained in nectar are primarily supplied to the nectary by the phloem tissue while the xylem tissue supplies water, the ratio of phloem to xylem tissue appears to determine the sugar concentration of the nectar secreted.
10. E) Solar Radiation or Sunlight
11. B) Photosynthesis
12. Anthesis is the opening of the flower and anther dehiscence is the opening of the anthers to release mature pollen.
13. The exine or outer wall of a pollen grain provides high resistance to mechanical or chemical damage. It also keeps it from drying out.
14. Bats, Moths
15. Rain dilutes the nectar, making it unattractive to honey bees. Rain washes the nectar from the flowers.
16. Sucrose, Glucose, Fructose
    Sucrose is most attractive to honey bees
17. Prevents pollen germination
    Begins the digestive process
    Prepares the pollen for long term storage
18. Nectar dearth- a time in which there is a lack of nectar producing plants in bloom within the foraging range of honey bee colonies. During this time colonies have a strong instinct for robbing.

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

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

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

Questions?

Inferior Queens

Concerning the method of raising a small number of queens described in the February "Bee Talk," I have two questions. First, I understand that when bees raise supercedure queens they often select larvae more than four days old, resulting in inferior queens. Would not this be a problem? And second, if the queen is removed, how do the queen cells that the bees build along the bottom of the combs get eggs in them? Do the bees remove eggs or larvae from their cells and put them into the queen cells at the bottom of the frame?

Tim Bouwmeester
Penticton, B.C., Canada

It is true that, by letting the bees build supercedure cells in a queenless colony, you have no control over the age of the larvae they select, but I do not think this is usually a serious problem. I have found that the bees usually know what they are doing, and beekeepers who have raised queens this way have reported good results. With respect to the second question, supercedure cells are built, not just along the bottoms of the combs, but wherever there are young larvae, which is usually on the face of the comb. The bees simply build the cells around existing larvae that they select. Enough of these are apt to be near the bottom of the comb to make it worthwhile to insert a rim there, as recommended, so as to prevent destruction of those bottom cells when the combs are removed. A better method would be to insert a frame of foundation a week or so before removing the queen, and then trim away the bottom of the resulting comb in such a way that the youngest larvae are along the bottom edge, thus encouraging the bees to build their supercedure cells there. This was the method of C.C. Miller.

No Africanized Bees!

You say you are "quite sure that Africanized bees will never invade the Northern States." Why? Couldn't an Africanized queen accompany a colony of migratory bees north?

Ed Ritterhausen
Polson, MT

Africanized bees have apparently not spread into Argentina beyond the southern latitude corresponding to that of the Carolinas here, and have been slow expanding beyond a certain vague line in California. From what I have been told, by several authoritative sources, they seem to be a tropical or subtropical species.

Shake The Bees

You say that you can get rid of AFB by shaking the bees in front of a hive with just foundation. How late in the year could this be done? And would not the bees fly back to their former hive?

Harold Rogers
Bellbrook, OH

This would have to be done early enough in the season so that the colony could build up again for Winter, and you would want to feed them sugar syrup to begin with, too, to hasten drawing out the foundation. The new hive would have to be on the stand that the original hive was on, and after shaking the bees off, the combs would be burned and the original hive scorched out.

Three Hives - Two Dead

I have three hives and found two of them dead this Spring. They have lots of honey which I would like to extract and sell, but I am concerned about the Apistan strips and grease patties. The strips were removed last Fall and the patties stayed in the hives. Is the honey contaminated?

John Apol
Grand Rapids, MI

The grease patties pose no threat to the honey, assuming they contain no terra, but I would not bottle honey that has been in the presence of Apistan. Besides this, the honey is likely to have absorbed moisture and be liable to fermentation. The best use of that honey, in my opinion, would be to hive swarms in those hives, or, build up the hive that survived and give one or even two of the dead hives a few combs of brood, with adhering bees, and a new queen. Those revived colonies would build up fast on that honey, but don't forget to treat for nosema.

How Far?

I have two colonies of three-banded Italians on my farm and two colonies of grey caucasians about two miles away. This Spring I plan to add three additional colonies of Italians, three of Buckfasts, and three of Starlines. How far apart should I put these various races to prevent their interbreeding? My purpose is to compare honey production among these several races.

Lee Brown
Pittsburgh, PA

That experiment would yield no reliable results because too many things are beyond your control. Nectar sources vary from one area to another, and even if virgin queens from your hives did not mate with drones from your other hives, they could still mate with feral drones. The simplest way to compare productivity is to have the different races all in the same apiary and compare productivity, perhaps over two or three years.

Questions are eagerly solicited. Send them to Dr. Richard Taylor, Box 352, Interlaken, New York 14847 (not Medina) and enclose a stamped envelope for direct response.

Answers!

Richard Taylor

Gleanings

MAY, 1998 • ALL THE NEWS THAT FITS

Honey?
HEALTHY FOODS

Enhancing the nutrition of the plants Americans eat was the focus of a U.S.D.A. forum held in Washington (March 9-11). In opening the conference, USDA Under Secretary Miley Gonzalez said, "There is strong evidence that a food supply enriched in naturally occurring, healthy compounds could put a significant dent in the $200 billion annual cost of diet-related diseases." Scientists from agriculture, nutrition and health, as well as industry representatives, spent three days in workshops discussing how advances in biotechnology, genetics and other sciences can be used to increase levels of natural, health-enhancing substances in plants, called "phytonutrients."

Phytonutrients include the broad range of natural compounds found in soybeans, tomatoes, garlic and many other plant foods. They have been proven to protect against cardiovascular disease, cancer and general oxidative damage to tissues among other functions.

When In Doubt, Throw It Out
WARM WEATHER & POWER FAILURES

The El Niño weather phenomenon is playing havoc with parts of the United States. Beyond property damage, El Niño is also raising questions about how to save food during catastrophes such as the recent California and East Coast floods or the devastating tornadoes that pummeled parts of Florida. Bessie Berry, manager of the U.S. Department of Agriculture's Meat and Poultry Hotline said, "The most likely problem to occur, whatever the disaster, is a power outage. That's when you want to preserve the cold air inside the refrigerator and freezer . . . The worst thing that can be done is to open the door and check whether the food is still cold." If it looks like power outage will last more than a few days, Berry advises to buy some "dry ice" for the freezer from a local ice supplier. If the electricity continues to be out for more than two days, then freezer food may have to be thrown out as well. Remember these rules: "You can't always rely on appearance or odor when trying to decide which foods to discard." Berry advises, "Ice crystals are a good indication that the food is still cold enough to be safe . . . NEVER taste food that is suspect. When in doubt, throw it out."

MANDELA PARDONS BEES

Even bees have rights in the new South Africa. President Nelson Mandela proved it last month by halting plans to resettle a swarm that attacked him in the bathroom of his country house. "The police wanted to remove them but I said no, they are perfectly entitled to select their own home," said Mandela, 70, who said he had been stung "four or five times" on the stomach and "also in parts I can't mention."

From Chicago Sun-Times

Get This Today
IF YOU TEACH KIDS

"Let's Buzz the Schools" booklet is a continuing effort to bring agricultural education to the general public and in particular to elementary school teachers and their school children. This booklet contains lesson plans, illustrations, vocabulary, and reference materials. It is designed for children in Kindergarten through 5th grade and will hopefully change some attitudes about a very important industry. Beekeeping lesson plans are developed for each appropriate grade level. Teachers have a choice of what lesson plans to teach and can use as many as they have time for. They do not need to have a background in beekeeping because materials with the necessary information is provided along with answer sheets.

People have misconceptions about bees and this usually develops during childhood. We want to inform the general public through their children. We want to show that the honey bee is a friend, not an enemy; honey bees sting out of defense; how they live and function in hives; how man uses the honey bee; and how important they are to mankind.

Honey bees play a crucial role in pollination, thus ensuring an abundance of plant foods for man, domestic animals, wildlife and enabling the persistence of plant species.

Education and promotion is the key. We need to work very hard to inform the public as well as our legislative officials about the importance of honey bees to mankind.

As beekeepers we should make every effort to get at least one copy in each of our local school libraries. This booklet is being offered at a minimal charge. If you would like to obtain a copy, please contact Loretta Suprenant, Box 300, Essex, New York 12936 or call (518) 963-7593.

FQPA Data
PESTICIDE INFO READY

The U.S. Department of Agriculture's Agricultural marketing Service released (March 27) its "Pesticide Data program (PDP): Annual Summary, Calendar Year 1996," The program provides statistically reliable data on pesticide residues detected in selected foods. The Environmental Protection Agency uses PDP information to assess dietary exposure to pesticide residues. The program analyzes exposure to infants and children as well as other sensitive populations as required by the Food Quality Protection Act (FQPA). PDP data are also used to reevaluate tolerances to support the new FQPA pesticide reregistration requirements. USDA uses PDP data to support the export of American products in an expanding competitive global market and to review good agricultural practices with respect to pest management issues. Copies of the 1996 PDP Annual Summary can be obtained by writing to the Residue Branch, Science and Technology, Agricultural marketing Service, USDA, 8700 Centreville Rd., Suite 200, Manassas, Virginia 20110, by faxing to (703) 369-0678 or calling (703) 330-2300. Contact: Demaris Kogut (202) 720-8998.

MAD BEES?

From *UPI Science News.* The French Government moved to combat an outbreak of what's being called "mad bee" disease, which the scientific community says is killing millions of honey bees in western France.

With half the money coming from the European Union, the French ministries of agriculture and environment said today a total $1 million will be spent to find out why the honey bees are dying.

A high bee kill was first reported last Summer by beekeepers who said increasing numbers of bees became disorientated and failed to return to their hives after gathering pollen and nectar from sunflowers. Beekeepers in the region call the malady "mad bee" disease and blame it on a widely used insecticide that the beekeepers say is destroying the insects' sense of direction. They report the phenomenon has drastically affected the region's bee population and dramatically reduced production of area's farmed honey by 60 percent. That's more than a third of France's total output.

At issue is what the Ministry of Environment reports may be the insecticide, Gaucho produced by the German agrochemical company Bayer SA. It is used to protect sunflowers from parasites. Ministry spokesman Andre Lesireux said, "The research will tell us why the bees turn crazy and die." The beekeepers say only those insects collecting nectar from sunflowers appear to be affected.

The Bayer group has agreed to contribute five percent of the total cost of research.

Franck Allaitru of the FDSEA agriculture union said in Paris, "A poisoning problem from insecticide is the only explanation for the behavior of the bees and their systematic disappearance during the first week that the sunflowers bloom."

Regional authorities have already suspended use of Gaucho in three areas of western and central France – the Vendee, Indre and Deux-Sevres. The research initiative, reported earlier in the newspaper Ouest-France will determine if the bees in those areas recover. But the French Green party has demanded the produce be removed entirely from the market. Gaucho first went on sale in 1994.

The produce says Gaucho is based on imidaclopride, a chemical which acts on the nervous systems of a wide variety of pests, including wireworm and aphids. Bayer SA defends the product as the most widely used sunflower insecticide in France and insists "the accusations have no scientific foundation

Bayer SA French marketing director Bruno Feldrops says imidaclopride has been used in more than 70 countries and was subjected to rigorous testing.

WI to MN & NB

RESEARCH SUPPORT

The Wisconsin Honey Producers Association recently solicited proposals from bee scientists located in North Central Land Grant Universities.

$4,000 was sent to the Entomology Department at the University of Minnesota to help, support the work of Dr. Marla Spivak on alternative treatments for Terramycin-resistant American foulbrood.

$3,000 was sent to the Entomology Department at the University of Nebraska to help support the work of Dr. Marion Ellis, on monoterpinoids (a group of essential oils) to determine both tracheal mite and honey bee acute toxicity, and Dr. Joel Coats, a toxicologist at Iowa State University at Ames, Iowa.

OBITUARIES

Erwin Raymond Glew, 77, of Sioux City, IA, died March 21, 1998 at St. Luke's Medical Center in Sioux City after a sudden illness. Erwin was a long-time branch manager for Dadant & Sons, Inc., working first at the Dadant, Paris, TX, branch and then starting the Sioux City branch which he continued to manage until his retirement in 1997. Services were held March 25 at Morningside Lutheran Church in Sioux City, IA.

Erwin was born August 22, 1920, in Delhi, IA, son of Raymond and Estella (Miller) Glew. He grew up on a farm in rural Delhi, IA, graduating from Delhi High School. He served in World War II, attended the American institute of Business in Omaha, NE, and was married to Zada M. Wendt June 30, 1948, in Delaware, IA.

Erwin went to work for Dadant & Sons, Inc. in the Fall of 1949, by opening the first branch at Paris, TX. His family grew in Paris with two girls, Barb and Bev and one son, Rick.

Zada had worked part time at the branch in Paris, TX and then worked full time in Sioux City at the branch. Erwin loved his work and especially enjoyed attending beekeepers' meetings all over the Midwest. He was well known and appreciated by Midwestern beekeepers in the states served by the Sioux City branch. Erwin was an excellent bee supply salesman, probably because he loved beekeeping so much.

Erwin kept bees for over 60 years, starting his first colonies in 1936 as an FFA project. He started with 14 colonies, but by the time he began his branch manager duties, he was running 200 colonies.

Survivors include his wife, Zada, of Sioux City; two daughters, Barbara Kaufman and Beverly Lessman, of Sioux City; a son, Richard of Omaha, NE, brother, Donald of Sun City, AZ; six grandchildren, and 18 nieces and nephews. He was preceded in death by his parents and two brothers, Lawrence and Leonard.

Otis Robert Mitchell of Bunkie, LA died March 12, 1998 at the age of 77. He was born in Bayou Currant, LA on May 13, 1920. In 1936, at the age of 16, he went to work for Overbey Apiaries in Bunkie, LA where his duties included carpentry, queen rearing, and colony management. In 1942, he was drafted into the Army, serving his country in the Army Air Force in England as a medic. In January, 1945, after his tour of duty in England, he returned to work for Overbey Apiaries.

By September, 1946 he went into beekeeping for himself and by January 1947, he began building and stocking 1,000 nucs from 250 colonies with the intent of raising and selling queens. By 1949 he had increased his colony numbers to 2,000 a number that he would manage until 1976. Annual income came from the sales of honey, package bees, and between 20 and 25 thousand queens annually. After 1976 he began down sizing the business but he continued to sell queens through 1997.

Mr. Mitchell was an active member of Louisiana's state beekeeping organization during his life. He was also very active in church affairs, serving from 1954 to 1997 as a deacon of the First Baptist Church of Bunkie. He is survived by his wife, the former Nona Smith, one son, two daughters, five grandchildren and three great grandchildren.

Jimmy Dunkley

HONEY BOARD NEWS

The National Honey Board recently launched a second Web site, Honey.com(www.honey.com).

The fun and factual Honey.com will be a resource for consumers, providing general honey information, cooking and storage tips, recipes and a kid's section.

New recipes, accompanied by full-color photos, will be added monthly and new consumer recipe brochures will be available on the site.

The original National Honey Board Web site (www.nhb.org) will be redesigned to meet the needs of the general honey industry as well as the foodservice and food manufacturing industries.

In the coming months, look for redesigned foodservice and food technology sections as well as new sections focusing on import/export issues and honey industry concerns.

"The Honey Board is really committed to Internet communications. Splitting into two Web sites makes finding honey information quicker and easier, something everyone using the Net is looking for," said the National Honey Board's information manager Susan Millsapps.

Both Web sites will be continually refined to meet the needs of both consumers and the honey industry.

Three new recipe leaflets are now available for your next honey promotion: "Good & Golden" (baked goods/desserts), "Health & Hearth" (cooking for two) and "Swift & Savory" ("speed scratch" recipes).

Beekeeping associations and assessment-paying supporters of the National Honey Board can order their choice of up to 500 recipe brochures per year free of charge. Additional brochures are available at 12 cents each. To order brochures, call the National Honey Board at (800) 553-7162. Brochures are also available to download from our new Web site: www.honey.com.

CARON WINS TWICE

Dr. Dewey Caron, University of DE recently received two teaching awards. The first, from the Eastern Board of The Entomological Society of America, was the Distinguished Achievement Award in teaching. The award reads, in part: The introductory entomology courses taught by Dr. Caron consistently attracts very high enrollments. About one-third of all undergraduate students and one-tenth of all students in the College of Agriculture take courses from Dr. Caron. Dr. Caron's student evaluations are consistently among the best in the department and the college. Dr. Caron is known to incorporate the best available multi-media tools effectively into his lectures. The positive impact of his introductory entomology courses on the undergraduates is credited by his peers as one reason for student retention in the undergraduate entomology program at the University of Delaware.

The second award came from the University of Delaware. The award announcement reads: On behalf of the Committee on Student and Faculty honors, it is our pleasure to inform you that Dr. Caron has been selected to receive an Excellence in Teaching Award at the 1997-1998 Honors Day ceremony. In addition to the honor, each recipient receives $2,500 provided by the Office of the President.

Nominations for the Excellence in Teaching Award are made by students, faculty and alumni and are carefully reviewed and evaluated by the committee on Student and Faculty honors. Dr. Caron's selection from among the many outstanding teachers nominated is indeed a great honor.

Dr. Caron is a Professor and Chair in the Department of Entomology and Applied Ecology at The University of DE, Newark, DE. He is also Chairman of the Board of the Eastern Apicultural Society of North America, and co-author of the soon-to-be released book on Managing Observation Hives, published by A.I. Root Company.

COMMODITY PROGRAMS

Mushroom Industry Supports Program . . .

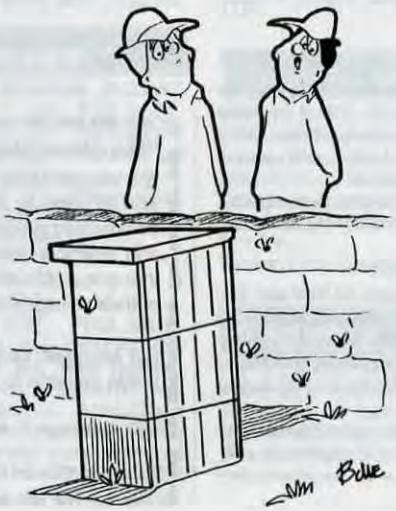
The U.S. Department of Agriculture announced (March 20) that the mushroom industry has voted to continue the promotion, research and consumer information program for fresh mushrooms. The program is authorized by the Mushroom Promotion, Research and Consumer Information Act of 1990. USDA's Agricultural Marketing Service conducted a referendum February 24 – March 13. Dr. Enrique E. Figueroa, administrator of AMS, said, "The results of the referendum indicate that 80 percent of those who voted favored continuance of the order and they represented 70 percent of the volume of mushrooms produced by those who voted." The program needed the approval of a majority of the voters who represented more than 50 percent of the volume of mushrooms produced and imported by those voting in the referendum. The program is administered by a council of nine industry representatives. The program is funded by an assessment rate of 0.45 of one cent per pound of mushrooms paid by persons who annually produce or import an average of more than 500,000 pounds of mushrooms.

. . . While Potato People May Not

The U.S. Department of Agriculture announced that on March 31 a signed petition was received from the Idaho Grower Shippers Association requesting that the Secretary of Agriculture conduct a referendum on whether to continue the national potato research and promotion program. In accordance with the Potato Research and Promotion Act of 1971, the Secretary of Agriculture will conduct a referendum if 10 percent or more of the potato producers and importers assessed under the program request the referendum. Dr. Enrique E. Figueroa, administrator of USDA's Agricultural Marketing Service said, "We are currently verifying petition signatures to determine if the petition meets the 10 percent criterion." The Potato Board administers an industry-funded promotion program for potatoes. AMS monitors the operations of the board.

LAND FOR BEES?

Agriculture Secretary Dan Glickman invited (April 8) the public to comment on a proposed rule for the creation of an innovative new conservation pilot program. The proposed rule was published in the April 2, 1998, edition of the Federal Register. Glickman said, "The Conservation Farm Option (CFO) pilot program will offer farmers incentives and cost-share payments to explore new ways to address resource problems in ways that will maximize benefits to the environment and keep farms productive." Deadline for comments is June 1. They should be addressed to Gary R. Nordstrom, Director, NRCS Conservation Operations Division, P.O. Box 2890, Wash, DC 20013-2890.



"When we divorced she got half of everything."

FREE BOOK LIST. Wicwas press, Box 817, Cheshire, CT 06410-0817. E-Mail: ljconnor@aol.com (TF)

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THE SCOTTISH BEEKEEPER. Magazine of The Scottish Beekeepers' Assoc. Rates from D.B.N. Blair, 44 Dalhousie Rd., Kilbarchan, Renfrewshire, PA 10 2AT, Scotland, U.K. Sample $1.

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IBRA: INFORMATION AT YOUR FINGERTIPS. IBRA is *the* information service for beekeepers, extension workers and scientists. We need your involvement - join IBRA - support this important information network and extend your beekeeping horizons. For more information contact: IBRA, 18 North Road, Cardiff CF1 3DY, UK. Telephone (+44) 1222 372409. Fax (+44) 1222 665522.

SCOTTISH BEE JOURNAL. Monthly magazine. Sample from Robert NH Skilling, FRSA, 34 Rennie St., Kilmarnock, Scotland. $4. per annum.

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IRISH BEEKEEPING. Read An Beachaire (The Irish Beekeeper) Published monthly. Subscription $15.00/year, post free. Mr. Seamns Reddy, 8 Tower View Park, Kildare.

THE AUSTRALASIAN BEEKEEPER. Published monthly by Pender Beekeeping Supplies Pty. Ltd. Send request to: The Australasian Beekeeper, PMB 19, Maitland NSW 2320, Australia. Sub. $US 27. per annum, Surface Mail (in advance). Payment by Bank Draft. Sample free on request.

BRITISH BEE JOURNAL. Monthly single copies 33p + postage. $15./yr. U.S. Annual sub postpaid. Sub-agent: 46 Queen St., Geddington, NR Kettering, Northants, NN14 1AZ, Eng.

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THE AUSTRALIAN BEE JOUR. Monthly, SeaMail $35. (Aus.), AirMail $50. (Aus.). Write to: Victorian Apiarists' Assn. Inc., Editor, Ms. Eileen McDonald, R.S.D. McKenzies Hill, Castlemaine, Victoria, 3450 Australia. Sample on request.

THE NEW ZEALAND BEEKEEPER. Published 11 times a year Feb - Dec. by the National Beekeeper's Assn. of NZ. Write for rates & indicate whether airmail or surface mail. NZ BEEKEEPER, Farming House, 211-213 Market Street South, P.O. Box 307, Hastings, NZ.

SOUTH AFRICAN BEE JOURNAL. The official organization of the S.A. Federation of Bee-Farmers' Associations. Published bimonthly in English & Africans, primarily devoted to the African and Cape Bee races. Subscriptions including postage (six copies). Payment to be made in S.A. Rands. NB. Sample copies available on receipt of donation. P.O. Box 41 Modderfontein, 1645, South Africa.

INDIAN BEE JOURNAL: International in appeal; keeps you updated with beekeeping developments in India and the world. Issued quarterly. Publishes research on Asiatic honey bees, tropical apiculture and pollination. Annual Subscription (foreign; including surface mail): U.S. $20 for individuals and U.S. $40 for institutions, by Bank Draft payable in Pune (India) drawn in favour of *Indian Bee Journal, Pune* and sent to Dr. K.K. Kshirsagar, Editor, 1294 Shukrawar Peth, Pune 411 002, India.

INNER ... Cont. From Pg. 6

away. And that won't happen until August of 1999 (Congress gave EPA 10 years to finish their tolerance reassessment, and OPs will be done in two) at the earliest. EPA started their assessment with the 'worst first' philosophy And then, the rules might change. That ceiling might be lowered, or EPA might not have removed enough OPs from the system. Or both.

I'm not criticizing the system, or not much anyway. Nor am I promoting Bayer's product, much anyway. What all of this is about is that there probably isn't much chance of a good, new product showing up in bee supply catalogs for *Varroa* control in the next two to three years. Which means, more than ever, that the correct use of the only product we have must be meticulously maintained. Apistan still works for almost everybody, and will control *Varroa* in your colonies so you can keep bees and safely make honey. It's all we've got until the EPA starts emptying some of their cups, and people like Bayer can do what they do best.

Kim Flottum

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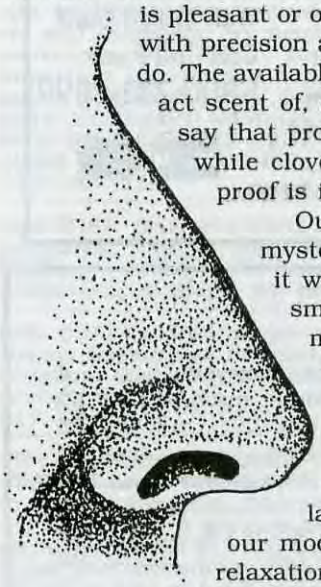
Beekeeping Makes Scents

Richard Dalby

Have you ever considered beekeeping as your nose perceives it? Probably not. Nor had I until a friend walked into my honey house and exclaimed, "This place sure smells good." He was right, of course. And his comment started me thinking about all the nice smells associated with beekeeping. As beekeepers, we get used to being surrounded by pleasant scents. Take away these scents, and beekeeping would still be a wonderful pursuit. But a lot of subtle pleasure would be gone from our craft.

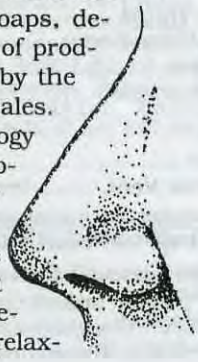
Fortunately, the scents of beekeeping are an integral part of bees and the products of the hive. One cannot be a beekeeper very long without enjoying the olfactory ecstasy of just-extracted honey, or the pungent smell of fresh propolis, or the sweet, clean scent of rendered wax. These scents and others are part of a beekeeper's world.

Yet there is little in the standard beekeeping texts on this aspect of beekeeping. Since scents are a peripheral subject, they seldom are mentioned. Then, too, we lack a precise language to describe what the nose knows. Our sense of smell tells us instantly if a particular odor is pleasant or otherwise. But if we attempt to describe with precision a particular odor, we find it difficult to do. The available adjectives just cannot convey the exact scent of, say, propolis or clover honey. We can say that propolis smells rich, pungent and exotic, while clover honey smells like vanilla. But the proof is in the smelling.



Our sense of smell is still something of a mystery. Scientists don't know exactly how it works. But it works anyway. When we smell a smell, our nose is responding to molecules coming from whatever we are smelling. These molecules are detected by a bean-sized receptor deep inside the nose known as the olfactory epithelium. Our noses can differentiate some 2,000 different smells. Particular smells can have a marked effect on our mood and outlook, evoking happiness or relaxation or one of many other states. Manufacturers of consumer goods are well aware of the power of scents. Hand soaps, detergents and fabric softeners are good examples of products whose various pleasing scents are deemed by the manufacturer to be very important in influencing sales.

There now exists a semi-scientific methodology known as aromatherapy which uses various aromas to treat such conditions as depression or stress. Long popular in Europe and Japan, aromatherapy has become more common in the United States. For example, an aromatherapist might use the scent of lavender or chamomile (derived from the plant's essential oils) to induce relaxation. Or the scent of peppermint or sage might be used to perk a person up.



As beekeepers, we get to enjoy all the pleasant scents associated with our craft. Call it, if you will, the aromatherapy of the hive. We know how pleasant a few hours in the apiary or honey house can be. What we might not have known is how much the various pleasant scents around us contribute to our pleasure.

So savor the pungent scent of fresh propolis, enjoy the sweet aroma of rendered wax, delight in the rare bouquet of honey new from the hive. These and other pleasing scents make up beekeeping as your nose knows it. Ah, ambrosia!

BOTTOM BOARD