Bee Culture

NOVEMBER 1993

WHAT ABOUT WAX MOTH?

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POLLINATING CRANBERRIES

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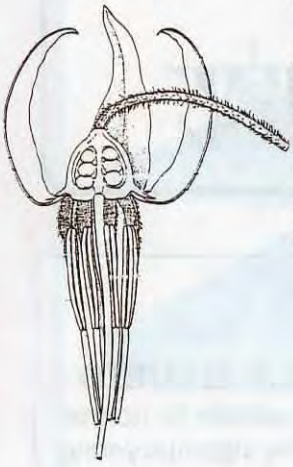
COLUMNS



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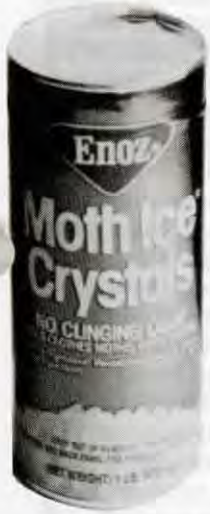
FEATURES



Cover

Harvesting cranberries can only happen after several events take place, in a precise and ordered sequence. One of those is adequate pollination – a service supplied by, and only by the beekeeping industry.

One challenge to that industry, however, is controlling wax moth, a particularly meddlesome pest in some parts of the country. Find out about cranberry pollination, and wax moth control inside.

Cranberry photo by Ed Nute, courtesy Ocean Spray Cranberry
Wax moth photo by Kim Flottum

INNER·COVER

In case you haven't noticed, the thing this industry has most wanted for crop producers has happened to us. The 'thing' is a significant reduction in the use of pesticides as a management tool to produce crops.

The past few years have seen literally hundreds of pesticide products taken off the market. Many more have gone from general use to restricted use (license required) and still others can be used on even fewer, mostly non-food crops, than before.

What new products have come on the scene tend to be less toxic, host specific, and safer to apply. Moreover, agricultural techniques that don't require the use of pesticides to produce crops are being studied, and encouraged, and implemented.

The government, bowing to public pressure is pursuing these activities with vigor, but at the same time looking closely at the economics of completely banning some chemicals – the benefit/risk scenario – with a more informed eye.

One result of this slow but steady march toward chemical sanity is that registration of new chemicals, and re-registration of existing products is more difficult. The rule makers want better answers now. The control of wax moth is a prime example of this progress.

Certan®, a B.T. product was probably the most benign pest control chemical ever invented (with the possible exception of the fly swatter and soapy water). When re-registration came up, the tests required were so extensive, and expensive, the manufacturers (rightly so) withdrew it from the market. Scratch one for the good guys.

Now a possibly dangerous chemical, para-dichlorbenzene has met the same fate. It controls wax moth, inexpensively and efficiently. But the possibility does exist that it could cause people problems – but the chances are very, very remote. Scratch another one for the good guys (but with a bit more enthusiasm, I think).

There is a good side to all this though. Since the traditional chemical approaches to wax moth control are no longer available, those that seek the truth have looked to (essentially) non-chemical controls. And lo, they work, they're inexpensive (or will be, once on the market), and they're non-toxic. What could be better?

The old saying, "Be careful what you wish for, you might get your wish", worked this time. We got our wish.

We were lucky.

•

There wasn't enough honey on most of my colonies this season to bother harvesting, so I didn't have to haul out the extractor or the rest of the stuff that goes with it.

The downside is that there's no new honey in the pantry, not one drop. But that's about all the downside I can think of. I didn't miss the mess, the work or the clean-up – not one bit, thank you.

The upside was that fall chores got started earlier than usual. Feeding was at the top of the list, but fall meds could get on early, too. So I spent a Saturday checking for queens and brood and food, putting on extender patties, putting in Apistan strips and plopping a bag of menthol pellets on the top bars of each.

I checked back in a few days to see how the feeders and the rest were doing. The first yard was fine – bees chomping down on everything available, propolizing the menthol bags and generally doing O.K. It was in the second yard I made my discovery.

In front of one colony, just one and no more, were about 35 or 40 menthol pellets, laid out in an exactly perfect double row.

But, I wondered, how did those pellets get outside, and in such a neat and orderly manner? I mean, after all, one of those things is almost as big as a regular bee, and probably just as heavy. Now I raise tough bees, but they're not that tough. There's no way they could pick up a pellet from the bottom board and drop it outside. I know one group of bees, sometimes called undertakers, remove fallen comrades from inside the colony. They push, pull and carry them out, up and away from home, but they don't line the deceased up in nice neat rows.

Well, I thought, maybe there's a group who have a different kind of responsibility. Like guards or undertakers, maybe there's a bunch whose job it is to push other things outside.

But to set up those nice neat rows they needed some help. So what I envision is, is that a select squad of bees, (bulldozers, I'll call them) heads down and shoulders (as it were) to the wheel, began pushing those pellets across the bottom board, down the ramp, across the grass and into those nice neat rows outside. To get those rows straight, with each pellet perfectly placed, there must have been some airborne spotters, giving directions, passing out information, letting those bulldozers below know exactly where to go. Probably with some type of dance – maybe a Pellet Prance, if you will.

You may question this tale of perfectly placed pellets, but I saw them out there, all in a row. The real question, in case you haven't guessed, is why?

Kim Flottum

Wax Moths, and Bulldozer Bees

Reader Assistance

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NEXT MONTH

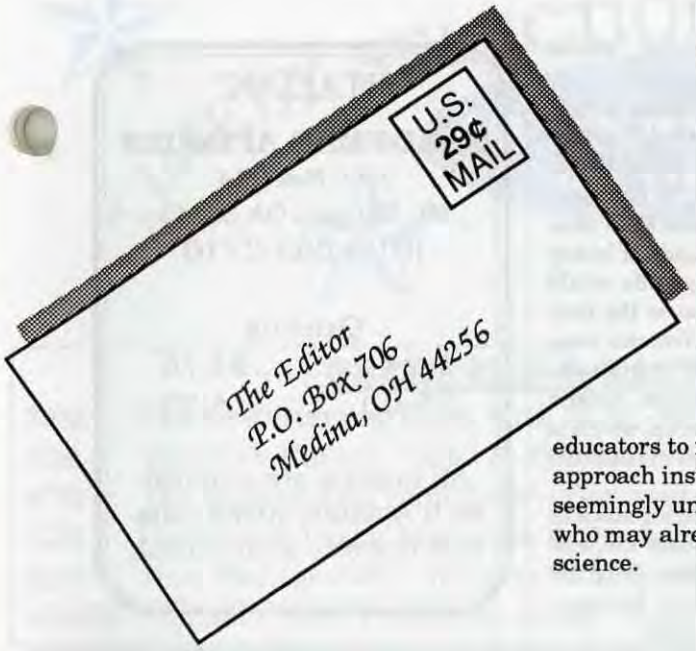
December brings the Holidays, time off from work, the heart of whatever it is you call winter, and a bit of extra time to enjoy your issue of *Bee Culture*.

We'll start with Clarence Collison's monthly brain teaser – Do You Know? Only this time it will be feature-article long – Clarence has written scores of these short exams, and Next Month he's put together the equivalent of a final exam on every aspect of keeping bees you can imagine. Put your thinking cap on and settle back for this one and truly find out What Do You Know?

But there's more of course. The second part of Dick Bonney's article on running a bee school will talk about how, who and what to teach so your students learn the most, and your teachers give the most. If you're planning a bee school this spring Don't Miss This One!

Then there's Steve Taber with his usual comments on keeping bees, and beekeepers; a great piece on pollination in Arizona – the crops, the locations, the prices and the problems; Research Review, Richard Taylor, The Honey Price Report, Mailbox, Inner Cover, Bottom Board, Tom Sanford, Ann Harman, Gleanings.

Yes, there's plenty in the December issue, and it's the perfect time of year to sit back and enjoy.



MAILBOX

■ Biology Through Bees

I strongly agree with Peter Popinchalk's perspective on teaching science through using bees in the curriculum (*Bee Culture*, Sept. 1993). I am now teaching a college course to non-science majors entitled, "Biology Through Bees" This course uses bees as the thread of continuity to which we constantly return. Questions relating to bee biology are given which require building enough background to answer them. For example some of the questions and areas of study are: "What is wax? chitin?" (macromolecules); "How do plants make nectar?" (photosynthesis); "Why do bees need oxygen?" (cellular respiration); "What is foulbrood:" (bacteria); "How does terramycin work?" (antibiotics); "What is the reaction to bee stings?" (immunology). The difficulty comes in narrowing the list of questions.

The laboratory component of this course involves some of the following: drawing external anatomy using a dissecting microscope, marking bees for observation, interpreting the waggle dance, preparing pollen from bees for viewing by electron microscope, and investigating plant anatomy and transpiration.

Using bees to organize biological information avoids the anthropocentric view strongly held by non-science students. It also stresses the sophistication and complexity found in invertebrates – especially those to which the usual reaction is immediate avoidance. The students are changed by this experience. I urge other educators to incorporate this type of approach instead of presenting seemingly unrelated facts to students who may already be turned off to science.

David H. Kesler, Ph.D.
Rhodes College
Memphis, TN

■ Canada Attraction

I'm writing to tell your readers about a very impressive tourist attraction about 15 miles east of Quebec City in Canada. It is the Musée de l'abeille, bee museum. Upon entering, you are invited to taste mead (honey wine) made at the museum. There's a gift shop with all sorts of honey/wax items; a room filled with nice displays demonstrating how bees make honey and build their hives – also beekeeping equipment is displayed. Two huge, well-kept observation hives (4' x 8' with two glass sides) let you see the queen at work. Then a 45-minute talk by a beekeeper in a screened area, actually opening hives, and explaining all about bees. There's also a display case of honey from all over the world.

This was all professionally presented in a fun way. And it was *free*. We highly recommend it to anyone traveling in that area.

Susan and John Flemming
Columbus, OH

■ Good Advice!

I am writing to let you know how much I appreciate the very helpful article by Richard Bonney: Winter Prep (Sept. '93). He said that small things can really mean big things and his advice wasn't about complicated manipulations, but easy-to-understand advise.

I certainly will try Mr. Bonney's way this fall to eliminate the moisture problem at winter time in my beehives.

Frederick Walliser
Philadelphia, PA

■ Flower Dust

In the last 15 years, nothing has ever been written in regard to dust on flowers. I am sure some of the dust gets into the nectar that the bees pick up and bring back to the hive.

I brought this up with the Pennsylvania State Bee Inspector, a very dear friend of mine, and he stated that the worker bee at the back of the stomach has a filter system that gets rid of the dust. I'm sure many beekeepers would like to know of this so they could pass this along to their customers and other beekeepers in case they should ask.

Kleber J. Minich
Natrona Heights, PA

Editor's Note: Honey bees have a valve between the crop (or honey stomach) and the stomach which acts as a filter, collecting pollen and, supposedly, other material. The valve edges are equipped with fine hairs to trap particulate matter. Nectar in the crop is screened through these hairs, but not allowed to pass into the stomach. Pollen, however, is captured and passed into the stomach to be digested.

■ Treating Nosema

On page one of last month's issue was a beautifully photo-illustrated advertisement by the makers of Fumidil-B (Mid-Continent Agrimarketing, Inc.) explaining the diagnosis of Nosema disease. A few days after reading this ad, I was stung by a bee which literally disemboweled herself while crawling away from the embedded sting. There stretched out on my finger was a swollen white midgut confirming the disease.

Continued on Next Page

MAILBOX

My first question is, was this just coincidental or do diseased bees disembowel themselves more easily than healthy bees? I have never seen this before; I have only been keeping bees for three years.

My second question regards Fumidil-B. In the many articles I have read on feeding bees (*Bee Culture*, October 1992, O.B. Wiser, pgs. 558-559) and books (*The Complete Guide To Beekeeping*, Morse, pg. 96) to name a couple, the ratio given for mixing sugar syrup is usually two to one in volume. (e.g., 2 volumes (gallons) of dry sugar (approximately 15 lbs.) to 1 (gallon) volume of water.) However, the literature which came with the Fumidil-B gives this 2:1 ratio as *weight*. I quote: "44 pounds of sugar in 22 pounds (2-3/4 gallons) of water will make roughly six gallons of 2:1 sugar syrup." Is this correct? Forty-four pounds of sugar costs $52.80 locally *on sale*! Add the cost of the Fumidil-B and you're talking almost $60.00 – or $10.00/gallon. I can buy honey cheaper than that!

Please check this out. Until then, I'm going to look into buying stock in C&H Sugar and Mid-Con!

Mark G. Forsythe
Gibsonia, PA

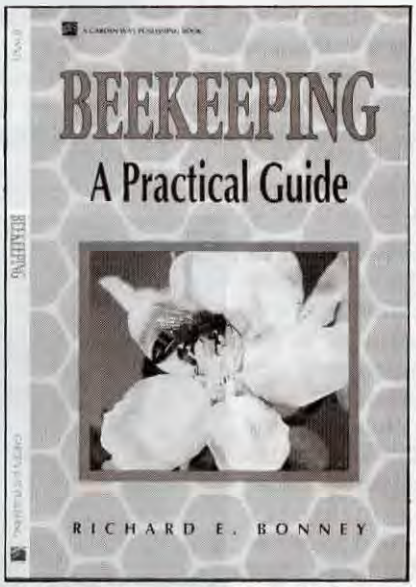
Editor's Note: Regarding your question on the sting – my sources seemed to think that bees suffering a debilitating disease would be less inclined, or able, to expend more energy than a healthy one. My guess is that she planted her sting deep enough to provide a strong anchor then pulled away. It is not uncommon.

It is generally recommended that fall feedings should have less water:sugar ratios than spring stimulative feedings so the bees have less water to remove when storing the sugar. That assumes they have the opportunity to remove it at all. If you are feeding syrup at the ratio you mentioned to feed sugar, note that you are only adding a bit over seven pounds of sugar per gallon – about the equivalent of one and a half medium frames of honey – not nearly enough for an overwintering colony. Remember, stored honey is only (about) 80% sugar.

However, if you are feeding only to dispense the Fumidil-B throughout the colony, a less dense ratio would be adequate, 1:1 would be fine. It is always better to feed honey for food than cane or beet sugar, (seven pounds of honey costs $3.50 – $5.00; 22 pounds would cost $10.00 - $15.00), because the bees don't need to work for it. You can measure the cost and labor differences between the two. This, of course, doesn't consider the use of corn syrup, which is significantly less expensive in both cost and labor.

I'd wait a bit before buying stock in the California & Hawaii Sugar Co., and maybe check out Archer Daniels or the like. Mid-Con however, may be interested in your investment offer.

BOOK REVIEWS



Beekeeping - A Practical Guide, Richard E. Bonney, 192 pages.

Finely written with the keen insight of a person truly committed to his avocation, *Beekeeping* takes beginners completely through the yearly cycle of beekeeping, carefully explaining the how and why of events and procedures throughout the seasons.

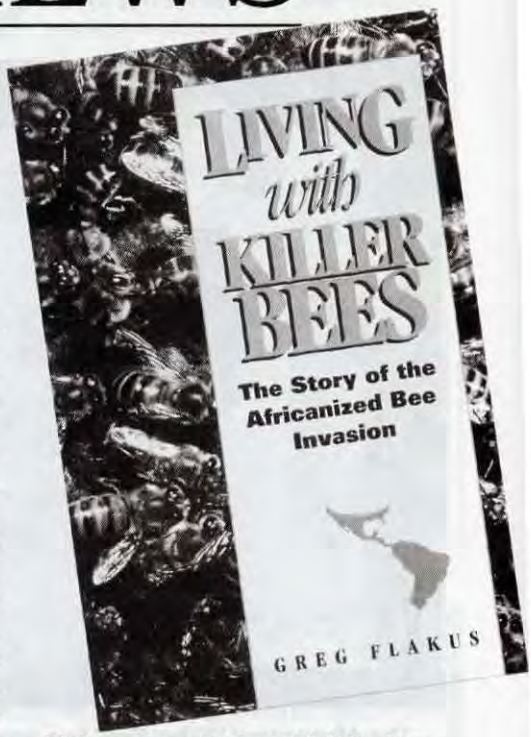
From "What is a bee?" to "How do I extract honey?", Dick Bonney provides the answers and explains the techniques that beginning beekeepers – or those with a season or two of experience – need to know. From acquiring and installing bees, to hive location, equipment and supplies, Bonney combines the ins and outs of beekeeping with personal anecdotes about the techniques that have worked for him – and the pitfalls to avoid. An overview of bees themselves, their colonies, nutrition and feeding, activity, and behavior is also included.

Beekeeping offers additional vital information on coping with diseases, mites, predators, and pesticides, plus a list of suggested further reading and equipment sources give the beginner a complete reference.

Dick owns Charlemont Apiaries in Charlemont, MA, where he lives, and teaches at the University of MA in Amherst. In 1991 he was named the Massachusetts Extension Specialist-author of *Hive Management: A Seasonal Guide for Beekeepers* (Storey Communications, 1990), and is a regular contributor to *Bee Culture*.

Beekeeping is available through Storey Publishers and The A.I. Root Company, plus other outlets.

Kim Flottum



Flakus, Greg. *Living with Killer Bees: The Story of the Africanized Bee Invasion*. 120p. illus.

Africanized bees have been sensationalized in some unrelentingly awful movies, but they do indeed attack people – though only when provoked. Of course, it doesn't take much to provoke them. As they advance their drones mate with European queens, so that for a time a hybridized zone exists, but then – because the Africanized bees produce more drones and queens than the European bees – the Africanized strain dominates. There appear to be variations on this scenario: South American stingless bees still flourish; in Africa, some strains of Africanized bees are fairly docile; Africanized bees do not winter as well as European bees. The latter characteristic may mean that – like fire ants – Africanized bees will not venture much farther north than Mississippi. Flakus, who studied the bees in Costa Rica and here carefully documents their 40-year migration from Brazil to the U.S., is calm and fair-minded, considering not just the impact on outdoor recreation but on agriculture, for which bees are vital. Can beekeepers work with Africanized bees? Yes. Will beekeepers want to? No. And that's the key to the industry.

But Flakus examines other aspects – outdoor recreation and industry, the consequences of suburban and even urban infestations and the ramifications of the bee on U.S. agriculture.

Written in an easy-to-read style, without the hyperbole or technical information of other texts, this book is not *for* beekeepers, but should be read *by* beekeepers to help them explain, in basic, easy-to-understand language, "What about those Killer bees?"

Killer Bees is available from Quick Trading Publishers, or The A.I. Root Company, plus other outlets.

Kim Flottum

Book Reviews, And More

The Africanized "Killer Bee" has arrived in the United States and so has a **Killer Bee T-shirt**. The shirt, developed by Garber and Company, was created to provide a fun way to spread informative facts about the newcomers with just a bit of off-beat humor.

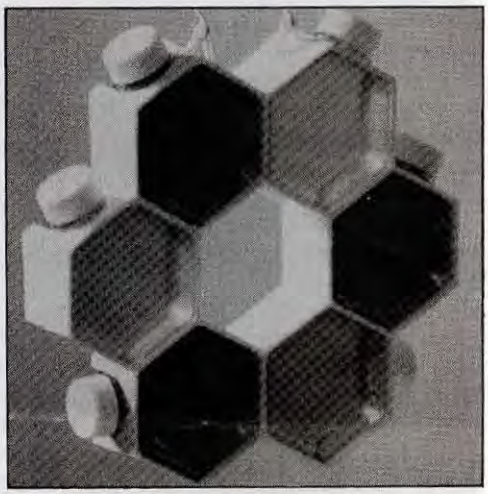
The front of the shirt depicts a 1950's horror film full color cartoon image of angry bees chasing a screaming blond. The back of the shirt lists 10 facts about Africanized bees and how to possibly avoid attack. One line states: "You can outrun a Killer Bee attack if you travel 15 mph for an 1/8 to 1/4 of a mile."

The shirt's creator, Cassandra Garber, came up with the idea during a gathering of entomologist friends discussing the upcoming arrival of Killer Bees. "We wanted a fun way to get the word out and dispel some myths that people seem to have about the bees," explains Garber. "The design for the front was based on all those classic, science-fiction, B-grade, horror films that poke fun at our worst fears.

The shirts are 100% cotton tees with six colors screen printed on the front and type on the back.

Available from the A.I. Root Co.

Kim Flottum



The Honey Light honey display device is unique in design and function. It consists of six individual six-ounce clear containers held together in a hexagonal frame. When placed (hung on available chain or sits on a stand) in front of light source – windows are perfect – the effect is amber stained glass.

When each clear jar has a different color honey the effect can be striking.

Makes a great gift, display at sales stands or table dispenser. Makes an effortless way to display several varieties of honey for tasting or viewing.

Comes packed in its own box which is ideal for shipping. Can be used in holiday gift baskets as is or with wax or other items.

Developed by the Drewes Brothers in Phillipston, MA, the Honey Light is available from them (508-249-5555) or dealers, including Drapers Super Bee, in Millerton, PA (800-233-4273).

Kim Flottum

The Wine and Food Library Catalogue – A Catalogue of Books Uncommon, Scarce or Rare. Gastronomy, Cookery, Wine and Beverages.

This catalog contains books, uncommon, scarce and rare. It has all of these but so much more.

If you are a student of history, and especially of cooking history, you should check out this catalog. With a focus on the time of Columbus and secondly the 1893 Columbian Exposition in Chicago many of these books are one-of-a-kind artifacts. One from 1588 (yes, 1588!)was written by the physician to Pope Sixtus V, another, from 1584 deals with wine, as does one from 1660. These are not inexpensive collector's items.

But by far the majority of the listings are more moderately priced, and cover a world of cooking and wine. Some groupings include Regional Mexican Cookery; The World Before Columbus; The Age of Exploration (1500-1800); The American Indian; The Origins of Food and Wine in Iberia; Latin America; Afro-American Cooking; Cathay, Cipaugu and the Pacific; Gifts of the New World, and Chocolate.

No, there's not a Honey Cookbook in the lot, but honey was used on occasion, and recipes can be found. The catalog authors are particularly aware of this gourmet ingredient, and have located several in the collection.

If you have an eye for the unique, a sense of adventure in the kitchen or love to collect wonderfully old books, I recommend this great place to start.

"The Wine and Food Library, an antiquarian bookshop founded in 1973, is devoted solely to books and related materials on the pleasures of the table and cellar. Clients include culinary historians, libraries and museums, authors, journalists, chefs, caterers, brewers, winemakers above all the enthusiastic private collector." – (from the catalog).

To purchase a copy of this catalog, send $5.00 to: The Wine and Food Library, 1207 West Madison, Ann Arbor, MI 48103.

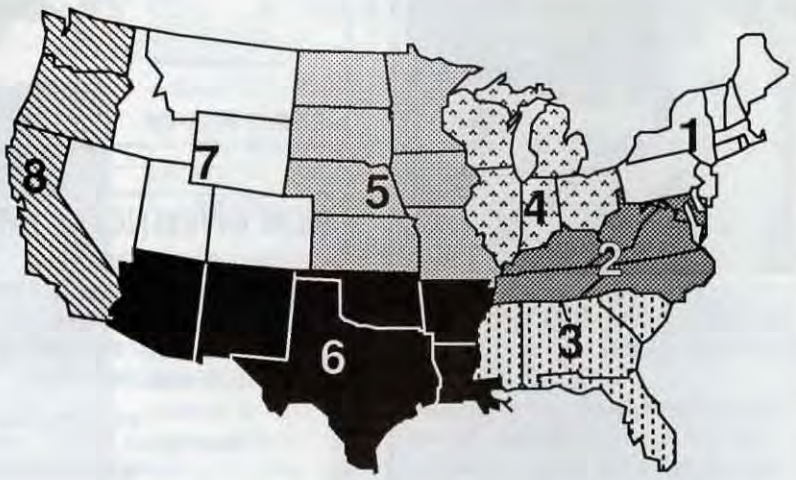
Kim Flottum

NOVEMBER Honey Report

November 1, 1993

REPORT FEATURES

Prices shown are averages from many reporters living in a region, and reflect that region's general price structure. The Range Column lists highest and lowest prices received across all regions, from all reporters.



	Reporting Regions								Summary		History	
	1	2	3	4	5	6	7	8			Last	Last
Extracted honey sold bulk to Packers or Processors									Range	Avg.	Month	Yr.
Wholesale Bulk												
60 #Light	48.72	45.28	44.68	41.50	42.15	42.50	44.90	41.73	31.20-58.00	44.85	42.63	43.03
60 # Amber	46.07	42.78	38.30	36.50	39.95	42.07	40.91	38.27	25.80-58.00	41.82	39.81	40.06
55 gal. Light	.723	.614	.656	.559	.525	.575	.535	.607	.51-.85	.607	.576	.608
55 gal. Amber	.638	.515	.549	.499	.490	.500	.529	.570	.44-.65	.558	.528	.551
Wholesale – Case Lots												
1/2 # 24's	21.83	21.83	19.21	24.90	29.12	21.04	22.00	18.40	16.50-36.30	21.93	21.50	20.59
1 # 24's	31.67	30.15	29.22	31.50	30.51	33.74	31.68	29.05	21.10-44.40	31.03	29.87	29.34
2 # 12's	30.35	29.52	27.80	28.80	28.18	34.05	29.48	30.85	25.25-48.00	30.20	28.10	27.47
12 oz. Bears 24's	30.57	30.04	28.37	25.10	20.00	29.63	27.77	22.74	12.85-44.40	27.87	26.44	25.13
5 # 6's	32.45	30.02	29.95	31.30	30.15	29.02	28.13	28.33	26.00-38.00	30.28	29.62	29.90
Retail Honey Prices												
1/2 #	1.19	1.27	.94	1.08	.96	1.17	1.09	1.14	.82-1.35	1.06	1.25	1.16
12 oz. Plastic	1.61	1.81	1.72	1.51	1.48	1.76	1.57	1.54	1.24-2.29	1.63	1.58	1.51
1 #	1.73	1.89	1.61	1.68	1.77	2.03	1.81	1.56	1.30-2.29	1.80	1.82	1.70
2 #	3.45	3.47	2.90	3.09	2.58	3.29	3.05	2.75	2.15-4.75	3.14	3.23	3.05
3 #	4.77	4.62	4.44	4.45	3.90	3.97	4.30	4.13	3.50-5.60	4.25	4.33	4.30
4 #	6.23	5.55	6.00	6.07	5.83	5.70	5.41	6.10	4.95-7.40	5.86	5.73	5.25
5 #	7.55	6.63	6.00	6.82	6.19	5.82	6.23	5.77	5.25-8.80	6.51	6.55	6.47
1 # Cream	2.33	3.35	2.74	2.21	2.07	3.20	2.31	2.36	1.74-3.95	2.52	2.37	2.17
1 # Comb	3.40	3.45	3.56	3.52	2.50	3.80	3.49	3.76	2.50-5.00	3.48	3.28	3.19
Round Plastic	2.70	2.77	4.60	2.97	2.71	3.38	3.65	3.33	2.00-4.25	3.05	2.88	2.41
Wax (Light)	2.46	1.35	1.59	1.41	1.54	1.73	1.83	1.32	1.00-3.80	1.72	1.79	1.74
Wax (Dark)	1.61	1.19	1.13	1.15	1.20	1.21	1.15	1.13	.90-1.95	1.25	1.36	1.32
Poll. Fee/Col.	35.70	25.00	27.50	30.00	33.33	25.00	30.00	31.50	20.00-45.00	30.38	32.54	29.27

We surveyed our reporters and others in each region about treating tracheal and varroa mites, nosema and AFB. We asked if they treated and what they treated with. Though not scientific, the results are interesting. Across all regions, the results were: Tracheal mites: two-thirds treat, using menthol (33%), Amitraz (21%), grease patties (54%). Fifty-six percent treat for varroa, using Apistan (73%), Amitraz (25%). Only 22% treat for nosema. Seventy-eight percent treat for AFB, using TM in sugar (50%), and extender patties (54%). The percentages don't always equal 100% because two or more treatments were often used.

Region 1

T.Mites: 88% treat, using menthol (57%), Amitraz (14%), grease patties (57%). V. mites: 63% treat, using Apistan (80%), Amitraz (20%). Nosema: 38% treat. AFB: 100% treat, using TM & sugar (50%), extender patties (63%).

Region 2

T. Mites: 80% treat, using menthol (50%), grease patties (50%). V Mites: 60% treat, using Apistan (100%). Nosema: 20% treat. AFB: 100% treat, using TM & sugar (80%), extender patties (40%).

Region 3

T. Mites: Half treat, using menthol (90%), grease patties (40%). V. Mites: 85% treat, using Apistan (85%), Amitraz (33%). Nosema: only 10% treat. AFB: 66% treat, using TM & sugar (80%), extender patties (25%).

Region 4

T. Mites: 33% treat, using menthol (22%), Amitraz (5%), grease patties (53%). V. Mites: 33% treat, using Apistan (100%), Amitraz (10%). Only 10% treat for Nosema. AFB: 66% treat, using TM & sugar (100%), extender patties (20%).

Region 5

T. Mites: 80% treat, using menthol (20%), Amitraz (40%), grease patties (60%). V. Mites: 80% treat, using Apistan (50%), Amitraz (50%). Only 40% treat for Nosema. AFB: 60% treat, using TM & sugar (40%), extender patties (66%).

Region 6

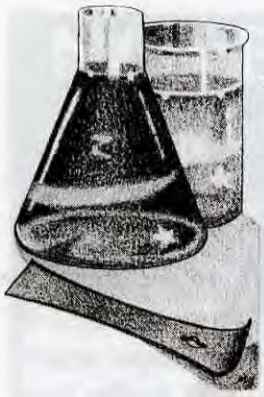
T. Mites: 33% treat, using Amitraz (50%), grease patties (50%). V. Mites: 33% treat, using Apistan (50%), Amitraz (50%). Only 17% treat for Nosema. AFB: 65% treat, using TM & sugar (50%), extender patties (50%).

Region 7

T. Mites: 50% treat, using Amitraz (10%) grease patties (100%). V. Mites: only 10% treat, using Apistan (100%), Amitraz (25%). Only 10% treat for Nosema. AFB: 100% treat, using TM & sugar (31%), extender patties (65%).

Region 8

T. Mites: 60% treat, using Amitraz (33%), and grease patties (75%). V. Mites: 60% treat, using Apistan (100%), Amitraz (41%). Only 20% treat for Nosema. AFB: 60% treat, using TM & sugar, (50%), extender patties (65%).



RESEARCH REVIEW

roger morse cornell university ithaca ny

Why is Honey A Safe Food?

Honey does not carry any disease organism that would have an adverse effect on people. It is a safe and unique food. However, there is nothing secretive about its special properties.

Honey is acidic; with a pH of about 3.9 mold, fungi, bacteria and other microbes cannot grow in it. (The pH scale runs from 1 to 14 with 7 being neutral.) However, it has fewer acidic properties than other foods with a pH of 3.9. Honey has a low pH because there are few buffering factors that might force the pH higher. Just a small amount of acid or base added to honey will push the degree of acidity several units one way or the other.

Honey is a supersaturated sugar solution, which gives it a high osmotic pressure. Osmosis is the movement of a liquid through a membrane, which takes place any time the concentrations on either side are not equal. That is why our hands shrink when they are in dish water for several minutes. Under these circumstances water passes out of our hands, through the skin and into the dish water. If a bacteria or other small life form is introduced into honey, water passes out its body and into the honey. The microbe's cell dries out and it dies.

Thus, ripe honey has two systems that protect it against microbial growth: a high degree of acidity and a high osmotic pressure. However, there is still another antibacterial system active in unripe honey that is truly a marvel.

The nectar that flowers secrete to attract bees is largely sucrose and water. Sucrose is the sugar found in ordinary white table sugar. When a worker bee collects nectar she adds two chemicals to it. One is an enzyme that splits most of the sucrose into two sugars, glucose and fructose. Glucose is the sugar usually made from corn while fructose is best known as fruit sugar. The second enzyme a worker bee adds to fresh nectar is glucose oxidase. This splits a very small part of the glucose into two substances, hydrogen peroxide and gluconic acid.

When nectar is collected and deposited in the hive, the bees work quickly to bring its moisture content below 19% where it will be protected by the high osmotic pressure. (Officially, Grade A honey has less that 18.6% water.) However, between the time that the nectar is collected and the moisture content made sufficiently low, 24 or more hours may elapse and during this time the unripe honey is protected by the glucose oxidase system and the hydrogen peroxide that is produced. The glucose oxidase system stops working when the water content of the honey is less than 19%. The hydrogen peroxide that is produced breaks down rapidly and is not toxic to humans in the quantity it is found. However, it is very effective against microbes. That's why honey has been used as a wound dressing with good results.

The gluconic acid is what causes honey to have such a low pH. Interestingly, this glucose oxidase system is not found in honey bees alone. Bumble bees, ants and even the solitary bees all produce glucose oxidase to protect their stored food, according to Mike Burgett of Oregon State University. This is discussed more fully in the book *Honey, a Comprehensive Survey*, by Eva Crane.

When worker bees feed their larvae honey they first dilute it. The glucose oxidase starts to work again, producing hydrogen peroxide and gluconic acid, and the diluted honey remains safe for the larvae to consume.

Most honey that is sold is pasteurized to kill the yeasts that will remain alive (but not grow) in honey. Pasteurization destroys the glucose oxidase system. Some people are critical of heating honey and destroying these enzymes, but since the glucose oxidase and the products produced in that system have nothing to with human nutrition I don't think it is important.

There is another good reason for pasteurizing honey and destroying the yeast cells. When honey crystallizes, it is only the glucose sugar that forms a crystal. The fructose remains in liquid form. However, the glucose crystal contains only 9.09% water. Since honey contains about 18% water the water content of the uncrystallized portion of the honey increases. If the moisture content of the honey is already high, the liquid part may become even greater and fermentation could take place, giving the honey a bad flavor and odor. Of course, heating the honey also melts any wax nuclei on which crystals may grow. This slows down the rate at which crystallization might take place and gives the liquid honey a longer shelf life.

The physical and chemical nature of honey that I am reviewing here is not new information but a collec-

tion of facts assembled by a number of researchers over a period of many years. An important contributor to our knowledge of honey is Dr. J. W. White Jr. who is retired and living in Texas. He still attends beekeepers' meetings and has a keen interest in honey.

Those who wish to study these facts further will find the book cited below useful. It contains chapters by White and references to the work by Burgett and others. Our understanding of honey came slowly and many people contributed to our knowledge. While this book is nearly 20 years old its facts are still valid and it remains an important addition to every beekeeper's library. Q

References:

Crane, E. *Honey, a Comprehensive Survey.* Crane, Russak and Company Inc. New York. 608 pages. 1975.

POLLINATING CRANBERRIES

howard scott

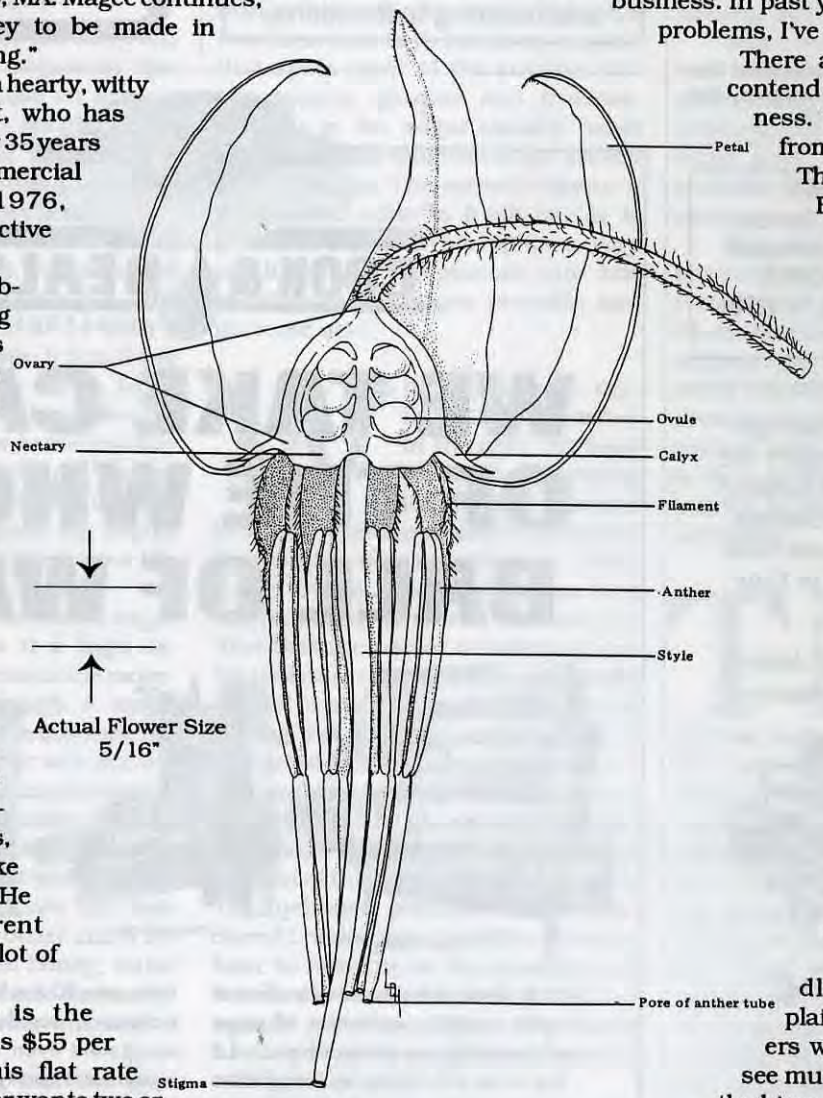
"If I had the locations, I would produce honey rather than rent to cranberry bogs," says commercial beekeeper Fred Magee, of West Bridgewater, MA, who rents 200 hives to cranberry growers in the dozen or so communities that ring Ocean Spray, the giant cooperative in Lakeville-Middleboro, MA. Magee continues, "There's more money to be made in honeying than renting."

Still, Magee, 61, a hearty, witty part Irish, part Scot, who has been keeping bees for 35 years and has been a commercial beekeeper since 1976, makes renting an active part of his business.

There are two problems in cranberry bog renting. The first is that cranberry plants in this area do not secrete enough nectar (the berry is small and irregular), so that the bees do not produce good honey harvests. Second, the hives are so scattered that it is hard for the beekeeper to maintain his hives. For instance, Magee can only get to his rented hives once every two or three weeks, and he can only make cursory inspection. He says, "When you rent hives, you give up a lot of control."

The advantage is the rental fee. Magee gets $55 per hive. He charges this flat rate whether the bog owner wants two or fifty hives. With 200 hives rented out last year, Magee's rental income topped $11,000. But he is quick to point out that that sum is gross, not net.

Says Magee, "Some bog owners think I'm making good money because the fee looks like easy income, but it isn't. There's the cost of feeding the hives to bring them up to strength, gas, truck wear and tear, insurance, the cost of replacing dead hives each year, the cost of replacing vandalized or broken hives, and the expense of medicating. Last year, I lost money on my pollination business. In past years, with fewer disease problems, I've done better."



There are several problems to contend with in the renting business. The first is competition from migrating beekeepers. These operators come from Florida or Maine, moving up and down the coast, renting their hives to bog owners for $35 to $42 a hive. Magee says, "the big growers – those who need 500 hives – tend to rent from these migrating beekeepers. The problem is they don't tend their hives, and often they don't do well. At least I take care of my hives."

Besides employing migrating beekeepers, some bog owners try to keep bees. But when they find out it isn't as easy as it looks, they usually give up in a year or two.

A second issue is handling bog owner complaints. Sometimes bog owners will call when they don't see much activity coming out of the hives. Magee says, "You try to accommodate your customers, so you come over the next day or so. But sometimes the bees are using a back door. Sometimes the wind is strong, and they're temporarily inactive. Bog owners want to see boiling hives, but that's not always possible."

A typical cranberry bog. The ditch in the center is used for irrigation, and for flooding during harvest.

A third issue is getting paid. Magee bills his accounts on delivery. Some send a check right away. Some wait until their October harvest, when they get paid. But every year, a few delay payment. Magee has two accounts on the books that haven't paid for last year's rental. He intends to take them to small claims court.

But bog renting is not without its pleasures. Magee enjoys travelling through the backwoods areas of the towns, likes dealing with bog owners ("between government regulation and local politics, they have a lot of headaches of their own"), and enjoys the push to get the hives up to strength and delivered. Magee says, "We try to get the rented hives delivered by the first week in June."

To experience that pleasure, we accompanied Magee and his assistant, Paul Durchame, of Taunton, MA, as they brought 52 hives to two cranberry bogs, one in Dartmouth and the other in Freetown. We met at 6:15 a.m. The evening before, Magee and Durchame loaded up their trucks plus two 12-foot open-bed trailers with hives. Magee says, "Loading up is best done at night, when the bees are in the hive. We used to deliver them at night, but that became too dangerous. Someone would get his foot caught in a gopher hole and go down, and the hive would fall on top of him. So now we deliver the hives early in the morning."

Magee recalls one evening he was delivering hives, and suddenly the road ended. The bog owner had changed the configuration, but neglected to tell Magee about it. Daytime negotiation of the bog roads aren't too bad. Magee says, "Stay on the tire tracks, and stay alert." Only once did he get stuck and had to be towed out. But that was at night, at a sandy spot in the road.

Colonies are moved on a trailer, held down with pallets tied with rope.

About moving bees, Magee says, "Movement is never good for a hive. At minimum, it sets them back ten days. A more serious problem is that the bees could ball a queen in their agitation, or it could set off their swarming instinct."

At their first stop, Magee and Durchame unload 43 hives in two different spots. Two hives were in place from last year. That was all that Magee thought could survive the winter. The hives on the trailer are topped with pallets and tied down by rope. The hive entrances are blocked in by heavy gauge bent wire mesh, edged with tissue paper.

Why tie down the hives? Magee recalled one beekeeper who didn't believe in tying hives down. One day, he went over a bump, and the hive super flew up and crashed on the ground. He went back to clean it up, but the bees were all over the road. A convertible came by, and the people got stung several times.

Why not use more secure entrance blocking? Magee says, "Some people get carried away using staples, wood blocks, etc. but the key element is ease of pulling out. This wire works fine – it's quick, easy, cheap. And since my supers don't have vent holes, I don't have to cork up holes."

Magee checks the wintered hives to see that they are healthy, then the

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Before moving it's important to check details - like lights, brakes, tires and tie-downs.

CRANBERRIES ... Cont. From Pg. 601

two men unload one hive at a time, first out of the trailers and then from the trucks. As they work, they talk to one another - 'ready', 'lift', 'easy' They also kid a lot. This helps them work. To pull hives from the trucks, the men use long staffs with curved ends, so they can hook and drag a hive out.

Hive placement in bogs is a tricky matter of trial and error. Magee says, "Wind does an awful job on bees. One year we put the bees in a shelf, right above the bog, and the wind coming over the ridge hindered their flying. With 30 MPH winds and the bees flying at 15 MPH, that doesn't get them very far."

So hive locations have to be sheltered by trees, brush, or high ground. Two or three locations on a bog will usually do. Clusters of hives are fine. They can be in single rows or columns a few feet away from each other. As Paul Durchame says, "The only side-by-side requirement is that the hive covers don't touch. They must be at least a charge card away from one another." The important thing is to face them so that so they get plenty of sunlight and are protected.

After the men unload the hives, they put on their veils ("because some of those bees are ornery"), and go from hive to hive, smoking each entrance, pulling out the wire mesh (or winter blocks), and placing a rock on top of the hive cover. To keep the smoker going between stops, they insert a cork in the funnel opening. That keeps the fire simmering.

All the hives have a minimum of ten frames of active bees (although the extension service says five to six frames are sufficient). Many have second storys. To produce up-to-strength hives, Magee feeds sugar syrup to needy hives, adds full frames to weak hives, and replaces queens if necessary.

The bog owners state how many hives they want, but the extension service recommends one hive to an acre. Magee has some customers who are understrength, who might rent two hives for six acres, and others who go overstrength. One customer has one and a half hives per acre.

At the second bog, Magee and Durchame unload nine hives, to bring the bog rental up to 15. By 10:00 a.m., they are finished. We visit a local donut shop and swap stories.

The cranberries are harvested in late September to mid-October. Magee

CRANBERRY STATS

Ocean Spray is to cranberries what Kelloggs is to cereals. Each name evokes the products it sells. This is not an accident. In 1930, three cranberry growers formed a cranberry growers' cooperative. The concept of a marketing cooperative was new then. Its central focus was to develop and promote new uses. Today, Ocean Spray Cranberries, Inc., in Lakeville-Middleborough, Massachusetts, with 750 growers nationwide, is one of the largest cooperatives in the world. It represents about 80 to 85% of all cranberries produced in the country. In Massachusetts the largest cranberry producer in the nation, 450 cranberry growers are cooperative members, growing about half the annual crop.

These growers cultivate 12,500 acres of cranberry beds and maintain 30,000 acres for wetland protection.

Massachusett's cranberry growers constitute the largest farming activity in the state. With an average harvest of 144 barrels per acre, Massachusett's 1992 crop produced 1.89 million barrels (1 barrel weighs 100 lbs.) at a crop value of $100.5 million dollars.

Ocean Spray has found use for this expanding harvest by creating new products. As recently as 35 years ago, cranberries were eaten mainly as a traditional Thanksgiving treat. Today, they are a year-round staple. Innovations include cranberry juice cocktail, cranapple and crangrape drink, Mauna La'i passion fruit drink, cran-fruit crushed fruit, and liquid concentrate. With 500 employees at Ocean Spray headquarters, and 2,000 additional workers at its processing plants in Bordentown, NJ, Kenosha, WI, Markham, WA, Middleboro, MA, Sulphur Springs, TX and Vero Beach, FL, Ocean Spray is a true American success story.

1992 Cranberry Statistics

State	Acres$^{\Delta}$	Yield/Ac (bbl)*	Total Yield (bbl)
MA	13,100	144.0	1,887,000
NJ	3,300	144.8	478,000
OR	1,500	192.0	288,000
WA	1,400	112.1	157,000
WI	9,800	137.8	1,350,000

*1 barrel (bbl) = 100 lbs. fruit

$^{\Delta}$ 1992 acres totaled 29,000 (USDA)

Colonies are set on 2" x 6" stands, moved by the 'armstrong' method.

tries to harvest all his bog hives by early October. He harvests by using a blower ("Yes, even I have succumbed to modern technology.") or by brushing off bees and bringing the honey supers back to his processing plant. Using a bee lockout (escape board) takes too much time, and fume boards don't work well, when the wind isn't right. Magee makes a second trip to pick up weak hives, and to close up the remaining hives for winter.

As for obtaining accounts, Magee does no soliciting and relies on word of mouth. He admits it would be efficient if he could service many bog owners in an area. Still, Magee says, "They know I'm around. They can call me." Besides, the 18 bog customers he services keeps him busy enough.

Last year, Magee obtained 3,200 pounds of honey, from a total of 390 hives. His best guess is that the cranberry bog rentals contributed 500 pounds, or 16% of his harvest. With 200 hives rented, that's 25 pounds per rented hive.

What's the bottom line? Cranberry bog renting may not bring in great harvests, but it's steady additional income, which helps the cash flow. Plus it gets the beekeeper out and around.

WHAT ABOUT WAX MOTH?

bill sames

Every year the larvae of the wax moth cause a tremendous amount of damage to bee equipment. The good news is that this terrible waste can be reduced or prevented if you become familiar with some inexpensive and safe control measures, and you can choose the method (s) that best fits your situation. Successful control of wax moths depends on a knowledge of honey bee biology, colony inspections on a regular basis, knowledge of control techniques and availability of equipment for control.

The first step is to observe the overall health of a honey bee colony. A colony that is free from disease, has a good productive queen, plenty of food stores and numerous workers is able to defend itself against wax moth invasions. Conversely, a dying or very weak colony usually has problems controlling the wax moth's spread. This leads to the myth that a colony was killed by wax moth which is not true. Weak colonies usually have other problems such as a disease, pesticide poisoning, a poor queen, no queen, or poor or low honey stores. You must recognize these problems, correct them and prevent the colony's possible death and subsequent destruction by wax moths.

When they're done, moth larva leave only a mess.

Regular inspection is essential to any productive colony management plan, and it goes hand in hand with knowing the biology of the bee. You need to physically verify that the colony has plenty of bees to cover the frames, that the colony is queenright, and that it is free of disease and mites. Sometimes, weak colonies may have guard bees at the entrance but inside the wax worms (wax moth larva) are already burrowing through the combs so you need to go into each colony.

In the past, chemicals such as cyanide, methyl bromide and ethylene dibromide were used to prevent wax moth infestation in stored combs. Vapona, found in some pest strips, also was tried but the beeswax in the combs absorbed the chemical and poisonedthe bees living on the comb. The Environmental Protection Agency (EPA) eventually banned the use of all of these products because of their potential contamination of honey products or their toxicity to humans. However, controls such as sanitation, freezing, paradiclorobenzene*, Certan™*, Phostoxin®, carbon dioxide and open air stacking are still available and they are effective. Control measures for stored combs should be implemented as soon as they are removed from the colony.

Scraping the bottom board at least once every year is a sanitation measure that will enhance wax moth control. The bees will sometimes drop bits of wax or dead bees onto the bottom board and become negligent in hive sanitation. A fair number of wax moth larvae can live and develop in this frass and, if the colony becomes weak, move into unguarded brood combs in very quick order. Bees tend to keep their bottom board cleaner after it has been scraped the first time in the spring. Melting cappings soon after extracting and eliminating miscellaneous piles of beeswax around the apiary or honey house is another sanitation measure that will help reduce wax moths.

It may become necessary to store combs for one reason or another. Stored combs that are not properly protected can be an exciting target for a female wax moth. In the northern United States and Canada, it gets cold enough during the winter to kill any wax moth eggs, larvae or adults that may be around or already infesting the combs. Beekeepers in the south can simulate this winter condition by freezing stored combs for at least four and a half hours at 20°F. The colder the freezer the less time is required to effectively kill the moth and its larvae. Leaving the combs at freezing temperatures for extended periods of time does not damage them. However, beeswax does become brittle when cold so care should be taken when handling the combs or hive boxes. Freezing works well but freezer space is usually limited so this method may not meet your requirements. Also, once they have been removed from the freezer, combs are susceptible to reinfestation if they are not protected in another manner.

Paradiclorobenzene (PDB), once sold in bee supply catalogs under trade names such as Para-Moth or Fumigator, is a white crystalline chemical which would kill all stages of the wax moth. It was applied by placing the crystals on a sheet of paper above a stack of supers. The

crystals vaporized through the boxes and killed any wax moths. Boxes need to be covered and tightly sealed (with tape over all cracks). A modification of this procedure was to place supers in a plastic bag. Add the PDB, squeeze out most of the air and seal it with a twist-tie. The bag helped reduce the smell of the PDB. Refresher amounts of PDB needed to be added every four to five months for continued protection. An advantage of this method is that individual boxes can be removed without disrupting the protection of the others. The reason PDB has been taken off the market is because it is a carcinogen. Reregistration for any use is not expected. And, although it is still available from a few outlets as a wax moth control, it very likely will not be for long.

Another method for controlling wax moths in stored combs is through the use of aluminum phosphide, commonly called Phostoxin® and available in tablets or pellets. Used to kill insects in stored food products such as almonds, barley, pecans, rice, wheat and many other agricultural products, Phostoxin® is also labeled to kill diseased or unwanted colonies of honey bees and it may be used to protect combs from wax moth damage. Honey that is exposed to Phostoxin® may be used as bee feed only. The recommended dose is 30-45 tablets or 150-225 pellets per 1,000 cubic feet of space. The boxes and combs are stacked in an airtight room; the Phostoxin® is measured depending on the amount of space to be fumigated and is placed on trays above the frames. The room is closed for several days or until the combs are needed again. It should be ventilated for several hours or days before people are allowed to enter and work in it for an extended period of time. When Phostoxin® is exposed to the air it becomes hydrogen phosphide (poisonous to humans), and an aluminum dust is left behind in the trays. Phostoxin® is a restricted-use insecticide and a person must have a certified applicator's license in order to purchase and use it. Therefore, it is not available for public purchase at local grocery or feed stores. However, local pest control operators can purchase and dispense the chemical.

Stored combs also can be protected by suffocating the wax moth in chambers of high carbon dioxide (CO_2)

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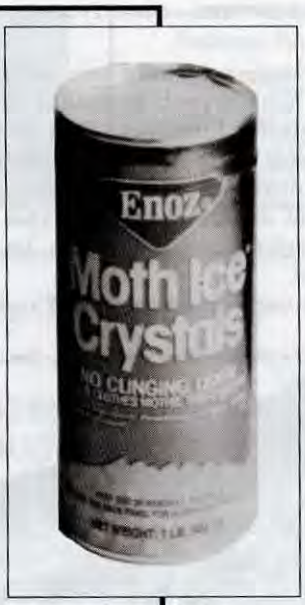
THE CASE AGAINST PARA



Para is still available, but it's not listed for wax moth control - only clothes moths.

The Delaney Clause prohibits the use of food additives, including pesticides, found to induce cancer in humans or animals. The Clause *requires* the Environmental Protection Agency to consider only a pesticide's use, however insignificant and not to consider any offsetting benefits. Paradichlorobenzene, when used as a fumigant in stored supers is considered a pesticide.

The Delaney Clause was enacted in 1958 at a time of insensitive instrumentation, lack of knowledge about levels of pesticides, and ignorance about causes of human cancer. Smoking, excessive dietary fat and some forms of cooking all cause cancer. Further, little was known then about natural pesticides (produced by plants) found in foods. These, too, produce cancer in rodents, yet are not considered under Delaney.

Paradichlorobenzene has been found to cause cancer in rodents. Its future as a pesticide, whether in stored supers, insect collections in museums or your closets at home is limited. The companies that manufacture para have chosen, for obvious reasons, not to register the chemical for many, and perhaps all of its current uses. Controlling wax moths in stored supers is one of those uses.

To our knowledge only one beekeeper's supply company still carries para for use in stored supers. Others may, however.

When a chemical is not re-registered for a particular use, the EPA allows sale of the chemical for a period of time to use all existing product. This protects retail sellers and end users from unnecessary expense or hardship.

If you have para now you may continue to use it until your supply is consumed, or, as near as we can determine until the end of 1994. (This date was not confirmed at press. The time limit may be sooner, we will attempt to confirm as information becomes available.)

If you do not have para now, you cannot legally use the product purchased from other than beekeeper's supply outlets, like grocery stores. The chemical, though identical, is not labeled for use in stored supers, therefore cannot be used for that purpose.

WHAT ABOUT WAX MOTHS... Cont. From Pg. 605

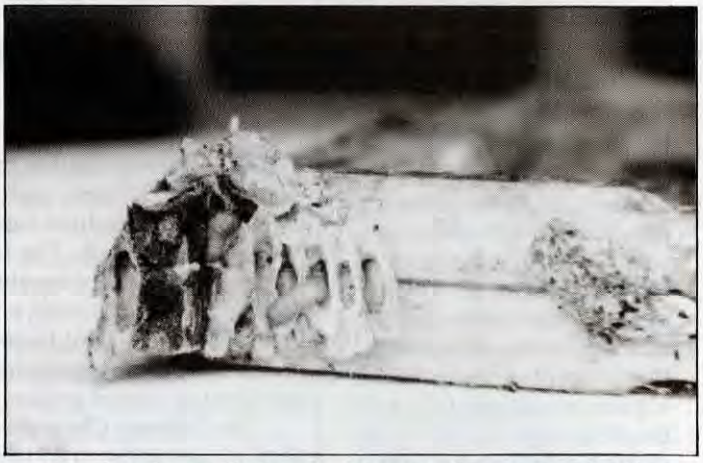
concentration. It was originally necessary to treat the combs in a 100°F airtight room for least four hours at 98% CO_2 with 50% relative humidity. This method requires special facilities and equipment. It is a viable method for storing large quantities of combs but, like Phostoxin® is not very practical for the hobbyist. This is, however, changing and techniques may soon be available to simplifyis process.

Supers left outside standing on end and not touching do not become readily infested with wax moth larvae. This technique is used mainly in arid or semi-arid regions for short periods of time. Damage from other sources such as curious mammals, the weather or termites eating into the wood may deter most beekeepers from using this method.

Wax moth control takes a lot of hard work. However, in time, the control measures become routine and the beekeeper will save the time usually spent repairing or replacing damaged equipment and enjoy better honey production because of improved beekeeping practices.

**The situation regarding Certan and para have changed. See box.*

Webbing over the tops of cells is a sure sign of a bad infestation.



One place larvae like to spin cocoons is the space under the frame lug.

FUTURE CONTROL

Several chemicals will probably remain in use for some time to control wax moths.

Phostoxin®, though a restricted use product is very effective and still available. However, the economics of scale certainly play a role in its use. A relatively large, airtight room or building is required, precautions in ventilation after treatment and cost will restrict its use to large side-line or commercial operations.

Carbon dioxide, used on a room- or building-size scale also has limitations, however down-sized applications are under investigation. These include using not only the gas carbon dioxide, but nitrogen, also, Early studies have investigated confining supers in large plastic bags, or even under tarps and introducing a gas. Leakage is definitely a problem, as is time of treatment. It is already known that a high concentration of either of these for a relatively short time, or, a low concentration for an extended time will control all stages of the moth in combs. The technology is used in grain storage facilities. Further work needs to better define length of exposure and concentration before recommendations can be made.

The beauty of this type of technique is that small cylinders of these gasses are available and could be used by even hobbyists. Costs have not yet been examined.

Another technique mentioned in the article is outside storage. Researchers have begun to look at this in detail now that other low cost controls are not available.

It has long been known that combs exposed to reduced- or no-light environments, coupled with little air ventilation become more heavily infested than those exposed to light and air movement. To see this for yourself, lay an old brood comb (during warm months) in a protected spot, one side up, for three or four weeks. Then turn it over. The down side will probably be littered with frass, webbing, all stages of larva and cocoons. The top will be relatively clean.

Researchers in the south, where long term off-colony storage during warm weather is common, are trying to take advantage of the light/ventilation control.

The easiest way to do this it seems, is to remove half the frames from each super and stack supers cross-wise one on top of the other. This allows ample ventilation and enough light to penetrate stacks even seven or eight high to suppress populations from building up.

Standing supers on end, after removing three or four frames also inhibits population growth, but this poses other problems with the comb.

Further investigation is required to determine the light and ventilation requirements necessary to suppress build-up.

francis l.w ratnieks

Over the past few years commercial beekeepers in the U.S. have faced many challenges to their livelihood. Some are largely biological in nature; for example, tracheal and varroa mites; and African bees. The severity of these biological problems can usually be lessened by appropriate scientific research, such as the effective chemical treatments now available against varroa. However, beekeepers face another obstacle, arguably more severe than those of biological origin, about which research can do nothing. That problem is the market. Unfortunately, the cost of both living and making honey continues to rise faster than the value of their main product – honey.

In response to the declining profitability of honey production U.S. commercial beekeepers have responded in many ways. Some have left beekeeping altogether, have diversified into other businesses or obtained a second job. Most have probably tried to make their beekeeping more profitable by increasing efficiency, keeping more hives, improving yields via migratory beekeeping and by obtaining pollination contracts.

Cox Honeyland and Gifts is the name given by Margene and Duane Cox to an innovative business they began four years ago that develops and sells a great variety of honey products and represents one beekeeping family's attempt to generate more income from their honey.

Duane Cox is a third generation commercial beekeeper and has a 3,000 hive operation based in Logan, Utah. His hives make only 30-50 pounds surplus honey per year, which is somewhat low for a commercial U.S. operation, because this is not prime beekeeping territory. Normally 85% of the honey was sold in bulk to packers. For the last 15 years income from honey sales has been supplemented by renting the hives for almond pollination in California, about 800 miles away. Gradually the income from these two sources became insufficient for the family's needs, hence the birth of Cox Honeyland.

The Coxes chose selling honey products as a source of additional income for several reasons. Most important was the belief that they had an excellent product, a belief based on their numerous local customers and the consistently high grade their honey received from packers because of its light color and low moisture. Also of importance was the location of their honey house, ideally situated for retailing one mile south of Logan on the main road out of town, and Margene Cox's prior retailing experience gained while head designer in a flower shop. Putting it another way, the Coxes felt that they would be better off if Margene ran her own business selling Duane's honey rather than working for someone else.

Margene Cox left the flower shop in the fall of 1989 and, following the advice of business expert Professor Marion Bentley of Utah State University Extension, developed her first product. This was a gift box containing jars of the several different local honeys made by Duane (such as a light clover/alfalfa honey and another, given the intriguing name "Top of Mountain Honey," that comes mostly from snowberry flowers), creamed honey and a honey

butter she had been making for years for home consumption and friends. Importantly, these honey products were already available. Their deliciousness was unquestioned. All they needed was to be presented attractively. The gift box itself was made of white cardboard and manufactured by a local packaging company. The lid, when folded up, had the outline of a skep hive with the words "UTAH The Beehive State." Utah, of course, is commonly referred to as the "Beehive State" so this was a good way of making a distinctive product with a local angle. Some of the most important customers for this first product were nearby corporations looking for Christmas gifts for clients, and the hometown flavor of the gift appealed to them. After Christmas the corporations received favorable reactions from the recipients so Cox Honeyland was off to a successful start.

In the ensuing years Margene has developed a whole range of honey-based products such as fruited creamed honey. The flavors include pineapple-apricot, raspberry, boysenberry, orange and cinnamon. The third year saw the introduction of a honey berry syrup (a blend of raspberry and red currant which can be eaten with ice cream and pancakes), fruit preserves using honey (peach marmalade and a blend of raspberry and blackberry) and gourmet nuts in honey (almond and pecan). Last year honey almond popcorn and honey candy were added. Collectively, Cox Honeyland uses all the honey produced by Duane plus an equal amount purchased from other local beekeepers including two sons who have their own beekeeping operations nearby.

All these products are available in attractive jars and bottles. For example much of the honey is sold in distinctive hexagonal jars imported from England and the labels are carefully designed to be eye-catching and often amusing. The honey is also sold in a great variety of sizes from one-and-a-half ounces to 60 pounds. To those accustomed to buying their honey by the barrel, bucket or one-pound jar at the local supermarket a one-and-a-half ounce jar might seem too small to bother with. However, it may be exactly what the tourist touring through the mountain states is looking for as a present for the folks back home. These products are also sold in various gift packs, such as six-packs of different honeys and Christmas and gift baskets. The latter often contain some other local specialty product such as Hovey hams, cheese or fruit.

Merchandise is sold in three primary ways. The Coxes' own store is a converted two-bedroom house. It has a large L-shaped floor area of about 800 square feet and is located 30 yards from the honey house beside the main road. Parking is ample and pulling off the main road easy. The store also sells honey products made by other companies as well as "bee-related" items, such as teddy bears and toy bees. There are also mail order and retail sales through supermarkets and other stores. One interesting feature of some of the supermarket sales is a stand-alone display designed around a hexagonal base. All too often, honey is a hard-to-find minor item in supermarkets. However, with this display the honey and honey-products really stand out. Of total production approximately 30% is sold in the shop and by mail order, and 70% by other retailers.

Retail prices depend upon size and packaging. Imported hexagonal honey jars are relatively pricey at $1.00 (1.5 ounce); $2.10 (4 oounce); $3.25 (8 ounce) reflecting their more gift-oriented nature. Those who are more economy-minded can buy one pound in a queenline jar or plastic skep for only $1.75, which is similar to supermarket prices, or a 60 pound bucket for $54.00. Fruited creamed honeys are the same price as regular honey in the 1.5, 4 and 8-ounce. jars, or $2.49 for a 12-ounce. plastic tub. Honey butter is $2.49 for an 8-ounce tub or $15.95 for a 5-pound pail. An individual serving (3/4 ounce) is sold for fifteen cents. The syrups sell for $3.50 in 10-ounce bottles. Gourmet nuts in honey range in price from $2.98 (4 ounces), to $4.98 (8 ounces).

Nuts in honey or plain honeys are simple to make. Others such as fruited creamed honeys, take time and care to develop. What fruits do you use? How much should be used? How finely should the fruit be crushed to blend in properly? With what honey does it blend well? What is the optimal final moisture content? In the case of the honey berry syrup, development was even more complex and took eight months of research in collaboration with Dr. Deloy Hendricks, of Utah State University's Department of Food Science and Nutrition. Whereas the fruited creamed honeys are still basically honey, modified with the addition of fresh fruit, the honey berry syrup is a complex product containing five natural ingredients (honey, raspberry juice, red currant juice, lemon juice and xantham gum used to thicken the syrup). Color, thick-

Continued on Next Page

Honey popcorn production.

COX ... Cont. From Pg. 609

ness, sweetness (using only honey), acidity and fruit flavor were important considerations.

All products are made and bottled in the honey house or the back of the shop, with the help of four to five people, including two daughters. Before Christmas, as many as 25 people work to put together gift baskets. The popcorn and honey butter cannot be stored for long so one day a week is devoted to mixing fresh batches. The rest of the time goes to making the other products, developing new ones and tending the shop.

Margene Cox has a simple business philosophy when it comes to introducing a new product. It doesn't go on sale until it tastes and looks right with consistent flavor and appearance. It must have an attractive label. Throughout, quality must be maintained. Other aspects of her philosophy are: To run what a banker would call "a closely held business" (basically, this means to be careful with money, be frugal and drop bad accounts.); know your customers and what they want; and be in it for the long haul. The last is not such a hard thing to do when you realize this is a family business in which two sons are also commercial beekeepers, and three daughters work either in the honey house or selling to stores.

Margene attends seminars and workshops on such diverse topics as packaging and display, retailing and business management, and makes use of the expertise available through the University extension service. Over the next few years her business goals are to increase mail orders, have more honey displays in supermarkets, develop new products and improve production and packing facilities.

Cox Honeyland and Gifts has weathered the critical early years during which most small businesses fold. Although no business is assured success, this one seems to have a good chance. Other beekeepers can draw an important lesson from it, namely that there are large numbers of people in this country who normally do not buy honey, but who are eager to buy a wide range of honey and honey-based products and gifts provided they taste good and are presented in the right way.

RUSSIAN HONEY PRODUCTION

b.j eakin

In the high mountain meadows of eastern Siberia the bees are buzzing. Each year in late March or early April, after a long cold winter in the barn, the hives are moved out to clearings in the forest and along the edge of the clover fields. In a small valley northeast of Vladivostok lies the small village of Chuguyevka. Here the bees produce about two million pounds of honey per year; about half of it is clover honey. The area is heavily timbered with pine and birch trees. Some beekeepers have cleared an area and built small huts in the forest where they stay with their hives during the entire summer. There are a great many bears in this area that come in at night, and take the tops off the hives to eat. The beekeepers are all heavily armed and keep watch dogs. Besides, bear hides and meat are good sources of income. So are the meat and hides from wild boars. Roasted boar meat has an outstanding flavor and is very top quality. Many beekeepers have the head of a wild boar displayed in their homes.

Beekeeping is a very important business in Siberia where there are tens of thousands of beekeepers. They experience the same problems we do, with mites being a major headache.

In addition, Russian beekeepers must deal with poor transportation and communication. The telephone system is as poor as any third-world country, making it very difficult to call across town and almost impossible to call across the province, territory or country. You cannot call any foreign country unless you use the lines of the KGB. The roads are poor to nonexistent. The valley I visited is about 125 miles northeast of Vladivostok but it takes from eight to 12 hours to drive the route. Ten miles out of Vladivostok the paved road ends, and the mud and dirt road, filled with large pot holes begins. Many of the bridges along the route are washed out and you must ford streams. Obviously, it's very difficult to get honey to market. Eighty miles due east is the Trans-Siberian Railway; it takes eight hours to drive to the station.

After the honey is extracted it is placed in a tote made of stainless steel. It's cylindrical in shape and looks very much like an LPG gas tank with a large opening at the top and a smaller opening or draining plug at the bottom. Four stubby legs hold it about three inches off the ground. A truck arrives, sets off an empty tote, picks up the full one and takes it to the processing plant where it's put into a hot room that is held at about 105°F. The room is heated by steam running through pipes in the floor, a common method for heating buildings in eastern Russia. The tote remains in the hot room for four days; the honey is then drained, filtered and packaged.

The packaging in Russia is much simpler than in the United States and other Western countries. Since there are no brand names there are no elaborately printed labels. For the retail trade, all the bottles are of one size, about half a liter, or 500 ml. For the candy factories and other large users there are three sizes of plastic drums; fifty liters, one hundred liters and two hundred liters. The honey is spun and packaged in a plastic half kilo (about one pound) package for the restaurant trade.

The major drink is Russia is tea and most people use honey as a sweetener so the per person consumption is greater there than in the U.S.

Since the collapse of communism and the rise of Yeltsin almost all beekeeping in Russia is in private hands. Once the bees were all part of the great state farm system. Now beekeepers can leave the system and take 200 colonies with them.

I was told by the managers of the state farms in eastern Siberia that all beekeepers had left the farm and taken the bees with them. The large state farms no longer produce honey in any quantity.

The man on the left is a Russian beekeeper. On the right is the author. The lady in the center with the fur hat is Galina G. Moskalyova, Chairman and CEO of the Primorskiy-Krai Inter-district Farmer's Association.

There are no government rules or regulations regarding beekeeping at this time. It is too early for the government to institute new rules. There is no government assistance to apiaries, and no reports to make to any agency, so Russian beekeepers are free of red tape.

There are a large number of

beekeepers in the small valley of Chuguyevka and they have formed a cooperative to sell their honey. In 1992 this cooperative sold 1,800,000 pounds of honey through new channels and had a 200,000 pound surplus. The old methods of marketing have changed and new channels for selling honey must be developed. This cooperative is called the Primroskiy-kria Inter-district Farmers Association, "ASTREA" for short. Co-ops in Russia are set up just like co-ops in the U.S. with a board of directors made up of the beekeepers and a hired manager who is not a member of the board.

This co-op hopes to export some of its 1993 crop to hard currency areas and do private label work for buyers in the Far East.

The Japanese are now buying many farm products from this area. The shipments are made from the port of Valdivostok to the port of Akita, Japan, which is only 400 miles away.

Honey is used for barter in this area of Siberia and brings a higher trading value than many other commodities. During a long and heavy winter, with no fresh fruits or vegetables, and the average meal consisting of mashed potatoes, boiled reindeer meat (no salt or pepper), toast and tea, honey has a very special appeal.

Last January I took a trip to Moscow for a bakery convention, where I noted some of the marketing techniques used to sell honey.

On paper it appears most honey in Russia is still produced on State run operations, but it seems most is sold by private individuals. One seller I looked at had brought his product 300 miles to sell it in a street stand. He was charging between five and ten dollars a bottle. Like every honey seller, he had some fresh comb handy to slice as samples.

In the private stalls there was a large selection of honey types available, including an unusual reddish variety from Siberia. Crystallized honey is popular, whether naturally or intentionally.

The sellers were mostly from beekeeping families, and knew all about their product. They were also informed on the curative properties of honey, royal jelly, propolis and especially bee venom.

Beekeepers are entrepreneurs, non-crime businesses and doing very well. It seems because of this that many people want to get in on the business

In stark contrast the state-run stores carried some of the worst honey I have ever seen. One color, leaking jars – yuk! There were no lines in front of those displays!

Tom Payne

Above and below - Private honey stands, large and small.

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THE THAI FARMER'S WIFE

michael burgett
tipawan sukumalanand
prachaval sukumalanand

Her name is Kampan Pengboonta. She is a vendor at the biggest street market in the city of Chiang Mai, Thailand. Because of her age and family status she is properly addressed as *Oui Pan* which, in northern Thai dialect, translates as respected grandmother. Her story is an insight into the fascinating ways that honey bees have been integrated into a traditional lifestyle in a nation where the native honey bees have been commercialized for hundreds of years.

Oui Pan was born in the Thai village of Pasang in 1928, about 40 kilometers southeast of Chiang Mai, the major metropolitan region of northern Thailand. She married in 1950 at the age of 22. This union produced a son in 1962. Today, in the traditional Thai manner, she and her husband, and their son and his wife, live together on a village farm of one and a half acres where they grow rice and raise a few cattle.

For over 30 years, *Oui Pan* has been a marketer of honey bee products. Six days a week she travels by bus to Chiang Mai from her home in Pasang, a round trip of 80 kilometers. She arrives at the market around 5:00 a.m. and sets up her wares on the sidewalk at "Gat Luang," the largest of the many street markets about this city of some 250,000 people. Her market stall consists of a wicker stool to sit on, a set of scales, and several baskets to hold her wares, all of which takes up some 12 or so square feet of sidewalk space.

Oui Pan's corner, with her wares of honey, wax and brood comb.

For an American, Gat Luang is an incredible experience. It is a major retail market for an astounding array of tropical fruits and vegetables, meat, fish, spices, flowers, clothing, household wares, electronics, jewels and gold. A large warehouse style building serves as the center of activity, but on all the surrounding streets, sidewalk vendors such as *Oui Pan* are hawking their products. The energy level is akin to a fire sale at Wal-Mart™! The atmosphere is an amazing mix of sights, sounds and odors that defines the Thai free market economy.

Oui Pan is a specialist vendor and trades only in giant honey bee (*Apis dorsata*) products. She offers honey, wax and brood comb for sale. On an average day she expects to gross $20 to $24 and will realize a net profit of $4.00. Her work day extends from 5:00 a.m. until noon; then she packs up her unsold produce and returns to the family farm.

She buys the giant honey bee products from a middleman, who obtains the material from indigenous hill tribe people in the mountains north of Chiang Mai. To the middleman *Oui Pan* pays a wholesale price of approximately $2.00 per pound for brood in the comb. The price per

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Giant honey bee colony that nested on a porch roof overhang. The single comb is nearly four feet in length across the top and two and a half feet in depth. There are approximately 40- to 50,000 adult workers on the comb.

THAI... Cont. From Pg. 615

pound of the honey is roughly $1.30 which she buys "pre-packaged" in used 750 ml. whiskey bottles. Honey costs her $3.20 per bottle; she hopes to sell it for $4.00. Any unsold brood comb, which has a short shelf-life, will be melted down for wax and sold for $1.80 per pound.

At Gat Luang there are additional street vendors who specialize in giant honey bee products. On any given day there may be three or four others in apparent competition with *Oui Pan*. However, she holds the upper hand. Not only is she a retailer, but she has arranged with the middleman to sell her all his daily "production." This in turn she will resell to the other vendors. Her many years at Gat Luang have given her an economist's wisdom in market control.

Throughout its Southeast Asian range *Apis dorsata* is considered an insect of commerce. Valli and Summers (1988) provide an excellent account of the giant honey bee hunters of Nepal. More recently Crane et al. (1993) discuss the traditional management of giant honey bees in southern Vietnam and Kalimantan (Borneo). Cadres of bee hunters seek out colonies to rob nests of everything except the adult bees. These bees most often build their single-comb nests many feet above the ground and are accessible only by climbing the tall trees, which presents a very hazardous situation for bee hunters. The response of a disturbed giant honey bee colony can be fierce. Morse and Laigo in 1969 described giant honey bees as one of the most dangerous animals in the world. In Thailand the human "predation" of giant honey bees is so widespread that one of the few safe refuges for the bees can be found on the grounds of Buddhist temples where the respect for all life forms excludes the entry of bee hunters.

Many Asian cultures have incorporated honey bee brood into their diet. In Thailand the brood is most frequently prepared by steaming in the comb which has been wrapped in a banana leaf. At Gat Luang buyers may purchase the brood either already cooked or "fresh" (alive) to be taken home for preparation. In Nepal giant honey bee brood is prepared by crushing the brood comb and collecting the liquid portion for cooking.

Oui Pan told us that in the early years of her enterprise she would often sell as much as 100 pounds of bee brood in a single day. Now, she considers the sale of 15 pounds as a banner day. Is this a reflection of a changing Thai diet or an overexploited resource? No one can say for certain, but we suspect that the long-term reduction in the giant honey bee forest habitat, an increase in agrochemical usage and heavy pressure from the bee hunters have all contributed to a reduced supply.

We first met *Oui Pan* in April 1988 when we were collecting giant honey bee brood for a research project on Asian honey bee brood mites. Our fascination with her livelihood has continued to grow as we became more familiar with her life's story. It is our hope that she will be able to continue her specialized entrepreneurship for many, many years to come.

Giant honey bee brood comb as offered for sale.

Organizing A Bee School

richard bonney

November isn't too early to start planning your next bee school.

Is your organization offering a bee school during the coming months? Yes, I know, you just finished putting your bees away for winter, the holidays aren't here yet, it's too early to be thinking about next year's bee school. But it really isn't, you know. The next two months will go by in a flash and there is so much to do. At least you can be thinking about it all, and be prepared to start actually doing as the new year moves in. Some of you are saying, he's not talking to me, we don't have a bee school. Well, maybe you should have one, and this is a great time to start planning. We'll help. And if you already have a bee school as part of your organization's yearly routine, maybe we can offer some fresh thoughts.

Let's start by reviewing a couple of reasons why a club might offer a bee school. One reason is that if handled properly, it can bring new members into your organization. This isn't something that just happens automatically, though. It takes some extra effort. However, it is worth that effort in these times of declining memberships. Some specific actions can help. For instance, make club membership automatic for anyone attending the school, waiving dues for the first year. Then, make the students feel that they are part of the group right from the start by appointing a mentor for each student, a member of the club who will keep in touch, give encouragement and advice, and call to remind them about regular club meetings. These mentors should come to class themselves as often as possible. If your club is small and your class is large, you may have to assign more than one student per mentor. This should not be a problem.

Once you have enticed your new members to start coming to meetings, be sure that the programs are meaningful to these novices. You cannot ignore the needs of the experienced membership, but you can add some content specifically for the benefit of the newer group. This all comes later though. Let's get the students first.

A second reason for offering a bee school is that it is in your best interests to have new beekeepers go through a course of instruction, rather than for them to just dive in without adequate preparation and knowledge. We have plenty of bee havers. We need more beekeepers. Let's teach them the difference. Then you can have some confidence that the new beekeeper down the road will not knowingly bring in mites, or allow disease to spread, or terrorize the neighborhood with excess swarming, or do any of the other things that can upset either the public or the beekeeping community.

Know: When, Where, Who, What & How

Accepting that a bee school is a good thing and that it is going to happen, there are some basic questions – when, where, who, what, how, for a start. When will we offer the school? Where will it be held? Who is going to teach? What will be the curriculum? How long will the course last? Will there be a fee? We can start with the when.

I believe that the start date for the school should be directly related to the start of the active season. Implicit here is the assumption that the new students are going to be starting or acquiring new colonies with the beginning of that season. It is a questionable practice to hold a six or eight week school early in the year and then have several weeks elapse before the bees actually arrive, or before hives can be opened. Without the immediate reinforcement of working with the bees, it is too easy to forget, or to lose interest. The students should be able to move directly from the classroom to the beeyard. Even more desirable is an overlap, so they can work with the bees before the class is over, their own hives or perhaps a club or mentor's hive. This gives the students an opportunity to exchange experiences and ask questions in class after gaining some hands-on exposure.

Towards this end, I believe that at least the last week or two of formal instruction should overlap the arrival of the new bees. Where I live, around the third weekend in April is the preferred time to install new packages. I have always tried to start my six-week classes in early March so that there is at least one, sometimes two, classes after the bees arrive. This is a critical time for both new beekeepers and new colonies, and the opportunity for demonstrations and hands on experience is important. With all of this in mind, identify a date that you can call the beginning of your active season and count back from there.

How far back do you count – how many weeks of instruction will you have? I will say here six weeks for your basic course, with follow-on sessions later in the season, and explain

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BEE SCHOOL ... Cont. From Pg. 617

my reasoning later. The important thing is to have a number so that you can reserve a suitable location in plenty of time. For a few people, location is no big deal. Meeting rooms and class rooms are readily available. For others, with limited facilities in the area, competition can be fierce.

The type of facility is important. I have used a variety – formal classrooms with chalkboards and projection screens, less formal classrooms and meeting rooms in a private school, a church, a library, a YMCA, a Grange hall, an empty store – each with its own characteristic furnishings. The formal classrooms, obviously, were best. The others ranged from poor to adequate. To me the important factors are student seating and the availability of a blackboard. The projection screen is also important but you can supply that (and the projector) yourself if necessary. Other amenities are less important perhaps, though the more organized the facility the better. For instance, trying to take notes while balanced on a hard, straight chair in a chilly room is not really conducive to learning. Not all students will take notes, but for those who do, the comfort of a desk, a table, or a tablet arm chair is important.

Given a time and a place, who is going to teach this school? This, and course content, are to me the most important questions to be answered in organizing a bee school. And judging from many of the course outlines I have seen over the years, these are often the areas given the least attention. In a way this is understandable. Most of us are not teachers, nor do we have experience organizing courses. It can be difficult to find someone with the requisite knowledge who is willing and able to get up in front of a group and present this important information in a coherent manner. Lacking truly qualified teachers, organizations often coerce individuals into doing something they are not really qualified to do. Because teachers and curriculum are such important areas, I will come back to them in some detail next month. Be thinking about this, though. For now, let's move on to the students. Where do they come from?

Advertising is the key. Let your offerings be known, and start early, at least four to six weeks before the first class, if that much time is available in your particular situation. Use all of the media available to you – word of mouth, daily and weekly newspapers, radio, letters or flyers to garden clubs, to bird clubs, to nature centers, anywhere that might have receptive people. Inform your local Cooperative Extension office. They often receive inquiries about beekeeping. Post flyers at garden shops, libraries, on public bulletin boards, again, anywhere that might be noticed by receptive people.

Repetition is important. For instance, a small ad in a weekly newspaper, repeated several times, is likely to get attention, whereas a larger one-time ad in the same paper might not. Some people might respond to that first or only ad, but with others that ad may only plant a seed. Seeing the ad a second or third time might be what it takes to make that seed germinate, and cause that prospective student to respond. And, of course, some people might not even notice a one-time ad. You need several. Don't scrimp.

As a part of your advertising campaign, be sure that all of the beekeepers in your area know about the school, even those who aren't regulars at your club meetings, and, if possible, even those who are not even members. Over the course of a year, every beekeeper probably encounters at least one person who expresses an interest in starting with bees. Give those experienced beekeepers the information so they can be your ambassadors.

Should you charge a fee? Yes, even if your club or sponsoring organization has an ample treasury. Don't buy your students. Make them pay a reasonable fee. The old saw that says you get what you pay for is true. If the course is free, there is a whole different mind set about the quality of what is being given and what is being received. Both the student and the instructors will take it all more seriously. Attendance and the drop-out rate will probably be better, too.

How large a fee should you charge? There are a couple of approaches to this. If your treasury is comfortable, then a nominal amount to cover expenses should suffice. If your treasury is depleted, add on a reasonable amount to help the club along. After all, you are offering some-

MAKE A PLAN

Any endeavor proceeds best if it follows a plan. Here is an outline for developing your bee school. Activities in the early weeks are somewhat sequential in dependencies.

- Determine the duration of the course.
- Identify the starting date.
- Identify and reserve the classroom.
- Prepare and present a budget.
- Prepare and distribute advertisements.
- Develop a curriculum outline.
- Identify the instructor or instructors.
- Develop details of the curriculum.
- Select text, if any.
- Develop handouts and other supporting material.
- Start classes. Tentatively, at least, plan on the following class sequence. Perhaps you will modify it to suit your particular circumstances.

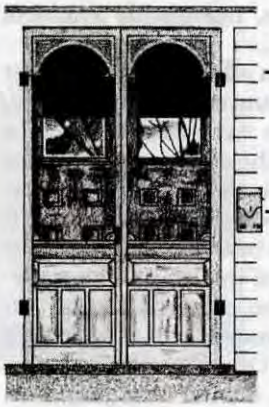
◊ Week 1 First meeting - classroom
◊ Week 2 Second meeting - classroom
◊ Week 3 Third meeting classroom
◊ Week 4 Fourth meeting classroom
◊ Fifth meeting - at the hive
◊ Week 5 Sixth meeting - classroom
Seventh meeting - at the hive
◊ Week 6 Eighth meeting classroom

Classroom meetings presumably will be on a weekday evening, and last about two hours. Some additional time for socializing and refreshments will help the students to feel a part of the group and will encourage later active membership.

At-the-hive meetings will be on the weekends.

Next month we can consider the content of the classroom and at-the-hive sessions.

Continued on Page 620



HOME HARMONY

ann harman

It's Cranberry Season

In my travels this past summer – actually I was on my way to the Eastern Apicultural Society meeting – I came across the Ocean Spray Cranberry World Visitor's Center at Plymouth, MA. Here I found a delightful small museum where excellent displays gave the history of cranberries, cranberry harvest and cranberry products. In one section you are invited to taste juices and treats made with cranberries. At the entrance to the museum is a miniature cranberry bog so that you can see how the berries grow. And in this display bog is a display beehive! Just outside the hive was a wonderful whirligig bee – put there, I am sure, to indicate to the non-beekeeping public that the strange white box was a beehive. If you ever visit coastal Massachusetts visit the museum. It is ever so much more interesting than Plymouth Rock.

The following recipes are adapted since they originally called for sugar. But honey goes so well with cranberries, I recommend the substitution.

Tex Mex Cranberry Salsa

I'll bet you never thought of using cranberries in Tex Mex cooking. However, the tartness of the cranberry blends well with the spiciness of the Mexican cookery.

1 cup water
1 cup honey
1 12-ounce package fresh cranberries
2 tablespoons chopped canned jalapeño peppers
1 teaspoon dried cilantro
1/4 teaspoon cumin
1 green onion, white and green parts, sliced
1 teaspoon lime juice

Combine water and honey in medium saucepan. Bring to a boil over medium heat. Add cranberries; return to a boil. Gently boil cranberries for 10 minutes without stirring. Pour into a medium-size glass mixing bowl. Gently stir in remaining ingredients. Place a piece of plastic wrap directly on salsa. Cool at room temperature, then refrigerate. Best if served at room temperature. Makes about 2-1/2 cups.

Ocean Spray Recipes

Southwestern Fajita Sauce

1/2 cup Cran-fruit crushed fruit for Chicken, Cranberry Raspberry or Cranberry Strawberry
1/2 cup honey
1/2 cup sliced hot cherry peppers with liquid

Combine crushed fruit and honey in small saucepan. Chop peppers in blender or food processor; add to saucepan. Simmer over medium-low heat for 5 minutes. Drizzle sauce over fajitas to taste. Makes about 1 cup.

Ocean Spray Recipes

Honey Gingerbread

Autumn is a great time for gingerbread. You probably have a favorite recipe but try this one with honey instead of the traditional molasses. Then, instead of whipped cream or lemon sauce, we'll put a yummy cranberry compote on top.

1 egg
1 cup sour cream
1 cup honey
2-1/2 cups flour
1/2 salt
1 teaspoon soda
1 teaspoon baking powder
2 teaspoons ginger
1/2 teaspoon cinnamon
1/4 cup oil

In small bowl, beat egg well. Combine sour cream and honey and add to beaten egg. In large bowl sift together dry ingredients. Add egg mixture. Beat well. Blend in oil. Bake in greased 9x9x2-inch pan at 350° for 30 to 40 minutes. Cool on rack 5 minutes. Remove from pan. Serve warm.

California Honey Advisory Board

Warm Cranberry Compote

2 cups fresh or frozen cranberries
3 cups pineapple chunks, cut in half
1 cup honey
1 teaspoon cinnamon
1/4 teaspoon nutmeg
Whipped cream (optional)

Combine ingredients, except whipped cream, in a medium saucepan. Bring mixture to a boil and cook just until the cranberries begin to pop; stir frequently. Cool slightly. Spoon warm compote over each serving of gingerbread. Top with whipped cream if desired. Makes 9 servings.

Ocean Spray Recipes

North Mountain "Coldslaw"

Here is a recipe for "coleslaw" that is a nice variation on traditional recipes. Try this with sliced turkey sandwiches for an after-Thanksgiving lunch.

1/4 cup sliced cranberries
1 tablespoon honey
1 teaspoon celery seed
1/4 cup mayonnaise
1 teaspoon vinegar
3 cups shredded cabbage

Combine cranberries, honey and celery seed. Let stand 15 minutes. Add the mayonnaise and vinegar and blend. Pour over the shredded cabbage. Season with salt if necessary.

The Cranberry Connection
Beatrice Ross Buszek

Continued on Next Page

HOME HARMONY ... Cont. From 619

Celery Cranberry Relish

If you are tired of the same old cranberry relish, try this easy variation.

1 pound cranberries
2 cups chopped celery
1 unpared apple, cut
1-1/2 cups honey
2 tablespoons lemon juice

Coarsely chop the cranberries, celery and apple. Stir in honey (you may wish to warm slightly for easier mixing). Stir in lemon juice. Cover and refrigerate. Makes about 4 cups.

The Cranberry Connection
Beatrice Ross Buszek

Oatmeal Cranberry Squares

Cranberries are versatile. They do not have to be used in relishes and sauces. These squares are just right for a snack.

Crust:
1 tablespoon butter
1/2 cup oil
1/2 cup honey 1/2 teaspoon baking soda
1/8 teaspoon salt
1/2 allspice
1-1/2 cups quick-cooking oats
1-1/2 cups whole wheat pastry flour

Cream together the butter, oil, honey, soda, salt. Mix in the oats and sifted flour and spoon half the mixture into a well-greased 8x8-inch baking pan. Press in firmly.

Filling:
2 cups cranberries, blended
1 cup drained, chopped or crushed pineapple
1/2 cup honey
1/4 teaspoon vanilla
2 tablespoons cornstarch

Mix together the cranberries, pineapple, honey and vanilla and cook for 15 minutes. Dissolve the cornstarch into enough cold water to make a paste. Stir this into the fruit mixture and continue cooking until mixture thickens. Spread the fruit mixture evenly over the crumb mix and cover with the remaining crumbs, patting down lightly. Bake for 20 to 25 minutes at 400°. Let cool and then cut into squares.

Honey and Spice
Lorena Laforest Bass

Now you are set to enjoy this season's harvest of our native American fruit – the cranberry.

BEE SCHOOL ... Cont. From Pg. 618

thing of value, not readily available elsewhere.

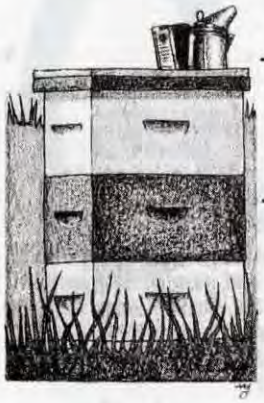
Implicit in all of this is a budget for preparing and running the course. You will have expenses. Perhaps a rental fee for the classroom, costs for advertising, for copying handout materials, for books if you use them (I recommend a basic text, provided by the club). All of this should be recoverable from the students in your tuition fee, but most of these costs will be up front. One of your very first actions, then, should be to prepare a budget and present it to the general membership for approval. Have the authority to spend money right from the start, with the understanding that the club treasury will be reimbursed as registrations come in. This budget, of course, will give you the necessary information to set that fee we discussed.

Next Month: Content & Teachers & The Rest

As you advertise and seek students, ask them to preregister, with a nominal deposit by a specified date, say a week before the first class. You cannot do your last minute planning adequately if you don't have some idea how many students you will have. If you are renting space to offer your course, you need to know in advance if you have enough students to cover the rental fee. Even if money is not an issue, preregistration will also tell you if you have the minimum number of students necessary to actually offer the class. I have found that from an educational point of view, a minimum class size of about ten is comfortable. As the number decreases from ten, group dynamics becomes increasingly poor, and neither the instructor nor the students are really comfortable.

It is not necessary that you adhere strictly to that specified date for registration, but it is a spur to get people moving, and last minute registrations should always be welcome.

Now the question is, what are they registering for, what is the course content? A related question is, who will present the material? We will deal with these questions next month.



BEE TALK

richard taylor

"Nature sometimes nurtures, sometimes withholds."

In my lifetime of beekeeping this has been the most dismal and depressing year I have ever seen. And it all began with such promise! Winter loss, according to reports, had been severe throughout the entire region and into the Midwest, many beekeepers reporting half and more of their colonies gone. Yet mine had all come through, most of them strong. I think, at that point, I became overconfident, and began making mistakes – I've already talked about those. But it wasn't just me. Nature played some cruel tricks too. On top of the problems of mites, which are manageable if you go about things right, the nectar flows just didn't develop as they should. And there is not a blessed thing a beekeeper can do about that – except, of course, hope for things better in the year to come. And I'm doing lots of that. I'm going to avoid the mistakes I made this year, get on top of any mite problems, then rejoice in the nectar flows that are sure to come.

All this has gotten me thinking again about nectar flows, and how unpredictable they really are, and how downright mysterious. My confidence that they'll be bountiful next year is based on hope, nothing more – beyond the fact, of course, that with the rare exception of a year like this one, they usually are copious in these parts.

But they are still mysterious. You would think that, by looking around and seeing what is in bloom, you could get a good idea of how well the bees are doing; but it does not work that way. You can see lots of bloom, on a good honey plant, and even see the bees working it, and yet find none of that honey in your hives. This has happened to me over and over. I see fields of alfalfa in bloom, for example, within view of one of my apiaries, and even check to find bees visiting the blossoms, and then find that none of that nectar came into my hives. The same with buckwheat. Few things fill me with such joy as the sight of buckwheat in bloom, a vast sea of it, but I have learned not to let that raise my hopes, for it can still be a year of no buckwheat honey at all. Then on the other hand, I have seen years when I got lots of buckwheat honey even though I had seen not a single field in bloom. That, of course, is not quite so mysterious, for it only indicates that the bees found a field that I didn't happen to see.

Then, too, you sometimes get honey, lots of it, when you have no idea at all where it came from. I have seen summers when I got lots of beautiful white comb honey quite late in the summer, long after all the sources of light honey known to me had come and gone.

People always ask me, after a bad year like this one, what went wrong. They assume the answer must be perfectly obvious. Well, there was no basswood flow this year, but I have an idea why. I could invent an explanation – such as, that it was too dry. But I don't really know. There have been other dry years when the basswood came through, reliably as ever. Or I can just say it must have been the weather, leaving it entirely up in the air what was wrong with the weather. And that, of course, amounts to saying that I have no idea what went wrong.

Sometimes beginning beekeepers tell me they're sure their bees will flourish, because, for example, of an apple orchard nearby, or some neighbor who always plants clover – that sort of thing. And sometimes beekeepers even plant things in their yards that they think the bees will "like." I do that too. There's a Chinese Evodia or Bee Bee tree in my yard, put there as a tiny plant that was a gift to me, and now as high as my house. And I also have a couple of Vitex trees out back, planted 16 years ago and now very large and full. These are covered every summer, late, with blooms and with bees. But I do not believe for a minute that these make any significant difference to my honey crop. I have certainly never detected any difference in the honey from the apiary nearby. Still, it is satisfying to have things like that, to see them bloom, and to see the bees go after them.

Nature is a vast and powerful force. Sometimes she nurtures, sometimes she withholds. I sometimes feel quite helpless in the sway of that force, but for the most part I feel a profound comfort – something like the way a baby must feel, I suppose, in its mother's arms.

QUESTIONS?

Inbetween Wintering

Q. If a one-and-a-half story colony has its top super (a medium depth one) filled with honey, but little or none in the bottom story, will it have sufficient stores to last all winter?

Henry L. Yoder
Flemingsburg, KY

A. It probably will, especially in Kentucky, where winters are seldom fierce, but the thing to remember is that, for maximum honey production, it is not enough merely to get your bees through the winter alive. They should be strong in the spring, when some of the best nectar flows come, and the heavier the hives are in the fall the stronger they will be in the spring.

AFB Control

Q. Do you treat colonies with Terramycin as a preventive, or only with diseased colonies?

Connie McMahon
Brushton, NY

A. You should never try to cure a colony infected with AFB, either with Terramycin or anything else. The only thing you can do with a diseased colony is kill the bees, burn the combs and scorch out the inside of the hive. Terramycin is quite effective in preventing AFB, and cheap and easy to use. I recommend using it routinely in every colony in the spring and or in the fall following label directions, when no supers are on the hives.

Dark Combs

Q. I have been keeping bees for 15 years and have yet to get any real light colored honey. I reuse dark, discolored combs in my supers; is this the problem? Or are the bees just not finding the right plants: I have also noticed that some of the foundation is very dark and hard in spots. Does this matter?

T.C. Horonich
Novelty, OH

A. Careful and controlled tests have been made to determine whether honey spun from darkened combs is darker than that spun from new or "virgin" combs, and usually no difference at all has been detected. Still this runs counter to my own experience, because the honey in my comb honey sections is always lighter than the extracted honey stored at the same time. Find your answer by using a super or two of foundation, and compare what you get. As for the darkened foundation, I do not see how this could make any difference. You should, in any case, be getting light honey in your Ohio area.

Editor's Note: When a comb becomes so dark that you cannot see light through it, it is time to change. Old combs have significant deposits of cocoons, propolis, dirt and dust, and all manner of foreign 'things' I strongly recommend a three-year rotation, no matter the color of your honey.

Cold Harvest

Q. I tried to harvest honey from my hive last year on December 5, but the super was full of bees and they would not move. Could I warm them with a hair dryer and then smoke them out?

J.A. Coleman
Wellsville, OH

A. No. A beehive should not be meddled with in winter. Wait until it warms up in the spring.

Tooth Decay?

Q. Does honey promote tooth decay? And what about cholesterol?

Roger Robtaille
Warwick, RI

A. Honey, like any other sugar or simple carbohydrate, encourages the growth of bacteria that cause decay in teeth not properly taken care of. The problem is avoided by frequent brushing. There is no cholesterol in honey.

Questions, accompanied by a stamped envelope, are welcomed. Address: Dr. Richard Taylor, Box 352, Interlaken, NY 14847.

ANSWERS!

Richard Taylor

Gleanings

NOVEMBER, 1993 ALL THE NEWS THAT FITS

Loans Still Available, China To Be Investigated

SUBSIDY PROGRAM GUTTED FOR 94 CROP

On Sept. 30, the House approved the Agricultural Appropriations Bill, which includes provisions for the loan program. The Senate had approved the loan program provisions a week earlier.

The honey loan program for the 1994 honey crop will feature:

- A *loan rate* of 50 cents per pound.
- A *recourse* loan program, under which the producer pays off the full loan amount, *plus* interest.
- It does not include the lower loan repayment (buy-back) provision.
- Forfeitures will not be allowed.

The 1993-crop honey program is not affected by the changes. The current program remains in effect for 1993-crop honey (which can extend until Dec. 31, 1994). The new program – for 1994-crop honey – will begin on April 1, 1994.

"The best benefit to come out of this year's legislative effort was a commitment by President Clinton to order an International Trade Commission investigation of Chinese honey imports," said Don Schmidt, President of the American Beekeeping Federation, and active lobbyist for the program.

During the investigative period, the President can order emergency relief, pending the Commission's determination of whether the imports of Chinese honey are disrupting the domestic honey market.

In Clinton's Budget Reconciliation Act the honey program portion of the 1990 Farm Bill was revised to gradually reduce the loan rate to 47 cents per pound and to limit payments, eventually, to $50,000. More changes came in the course of the Agricultural Appropriations Bill, only to the 1994 honey crop since appropriations are an annual process. What could happen to 1995 and beyond crops remains to be seen.

MO Beekeeper of the Year

Bob Finck, right, was given the award of "Beekeeper of the Year for Eastern Missouri Beekeepers' Assn." The award was presented at a banquet in St. Louis, MO, March, 1993. He has been President of the local beekeeping association for the past four years.

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Honey Bees Needed

SAINFOIN COULD BE BIG CROP

Agriculture Canada researchers have found that commercial beekeepers will be needed to lower the cost and raise the seed production from sainfoin, a perennial forage legume.

Sainfoin, used for hay and pasture production, is of particular value to farmers because it does not cause bloat in livestock.

But its use has been limited by the cost and availability of seed. Seed supplies have been inadequate, primarily because reliance on native insect pollinators provides inconsistent seed yields.

Dr. Ken Richards, an entomologist at the Agriculture Canada research station in Lethbridge, Alberta, has been researching the pollination requirements of the plant, including the degree of cross- or self-pollination, pollinators and the population of pollinators needed for sainfoin.

Richards recently tested the effectiveness of various bees with sainfoin. Six species of bees were identified as being pollinators of sainfoin, with two species predominating.

Alfalfa leafcutter bees accounted for 56% of the pollinators, honey bees 40% and four kinds of bumble bees four percent.

With those ratios established, knowledge of the diversity of native or domesticated bees foraging on a crop was necessary to recommend the numbers of and types of bees needed per unit area of crop for maximum pollination.

"We used a pollination model based on the length of time each flower of sainfoin is available for pollination, and the foraging rate

Continued on Next Page

SAINFOIN ... Continued From Pg. 623

and pollinating efficiency of bees to calculate pollinator needs of crops," Richards said.

"The model predicts the probability of an individual flower being pollinated under various pollinator and flower densities," he said.

"At peak sainfoin bloom, the required population of bumble bees to ensure pollination is 3,600 per hectare, two thirds that of honey bees or alfalfa leafcutter bees.

"When insufficient native bumble bees exist in an area, seed growers should supplement them with honey bees or leafcutter bees to increase the number of sainfoin flowers visited and thereby increase seed set and yield."

Display Index

A lot of beekeepers use two deep boxes for a brood chamber. With this arrangement it is easy enough to position frames of empty drawn comb so the queen always has plenty of room to lay. But there are several disadvantages.

First, I don't like to lift heavy deep boxes. Second, I don't want my honey stored in brood combs. And third, I like the overwintering honey to have Fumidil-B® in it which means feeding in the fall. All this can be worked out using one deep brood chamber, a queen excluder and medium supers for food and/or extraction. But it takes some doing.

Frames in which the bees have stored honey and/or pollen in excess of their short term needs can be removed and replaced by drawn comb only if no eggs or brood are in them. But what to do if they also contain eggs or brood? Those (deep) frames can be moved to the *second* medium super above by removing those medium frames *plus* those directly below in the first medium super. As soon as the brood has emerged, remove those brood frames and replace the medium frames previously removed or with more frames of brood. By selecting those brood frames with the most advanced sealed brood, this time can be minimized. The bees could hang comb from below those deep frames in the space in the first medium super but I find they don't in the short time they are there.

This is unwelcome extra trouble but it is made necessary when the bees persist in storing too much nectar in the brood box at the same time the queen in hurrying to build up her colony. In order to have empty drawn comb to put into the brood box, I extract the honey, capped and uncapped, after the brood has emerged. This honey is saved and fed back in the fall so the bees will store it in the medium food supers.

I have never felt free to open a hive when it was cold enough outside to induce the bees to form a cluster but I accept the often seen assurance that they do. The image I have is of a bubble rising slowly through thick molasses as the bees slowly consume the honey above and adjacent to the cluster. If this is so, why do we arrange their winter stores to fill the boxes from side to side instead of extending it vertically? Doesn't it make more sense to have five or six frames of honey, perhaps with an empty drawn comb in the center, and fill the balance with empty frames? Then stack two of these food supers on the brood chamber to constitute a tall, narrow overwinter hive?

On the first warmish day in spring, rearrange the frames in one super to provide some room to store early nectar and pollen plus adequate unused winter stores. Evacuate the bees from the remaining frames consolidated into the other super with an escape board or inner cover. After this super is empty it can be removed. You can then revise the remaining boxes to encourage the queen to move her brood raising into the brood chamber. At the proper time, the brood chamber can be reversed again to the bottom position and a queen excluder installed.

Sometimes You Do For Fun.

dan hendricks

BOTTOM·BOARD