JUL 1996

BeeCulture

Build a Polariscope
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Run a better Bee Booth
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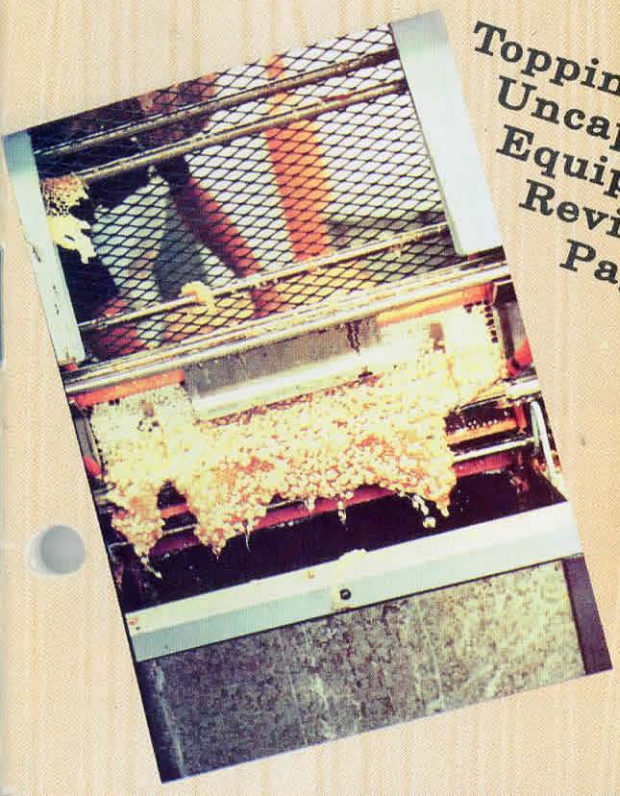

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Uncapping Equipment Reviewed
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Make This Bee Blower
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Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

JULY 1996 VOLUME 124 NUMBER 7

FEATURES

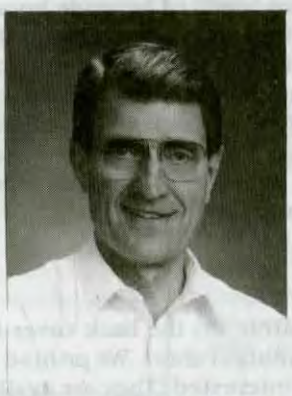
BACK COVER

Since our front cover is full of all manner of things from the inside this month, we thought we'd bring some attention to our back cover. This is a year-old-queen, removed from a colony the day before the photo was taken and kept in a queen cage with a couple of workers. The bees she was producing were not particularly gentle. Not at all gentle in fact, and she needed to go. Just before the photo was taken we put her in the fridge, then out of the cage and on ice. That slowed her down to essentially immobile. Then under the camera and lights and six shots later she warmed up and was ready to go. She didn't but was an excellent model for this series. The "What Kind of Bee" information sheet that's on the back cover, is available from Bee Culture *magazine in 50 sheet packs. The back is blank.*

photo by Ken Chamberlain
The Ohio State University, OARDC

DEPARTMENTS

COLUMNS



JOHN ROOT
Publisher

KIM FLOTTUM
Editor

Bee Culture is Printed on Recycled Paper

INNER COVER

Next month the five-year referendum for continuing the National Honey Board (NHB) comes up again. Basically, the people who are assessed a penny a pound for every pound they produce are being asked if they are getting their money's worth.

That money has been spent on promotion, advertising, making contacts, generating information, educating honey users and honey producers . . . and a whole raft of other activities that either promote the image, use or consumption of honey.

On the wings of this referendum is the promise of a soon-to-be change in the way the NHB does business. If all comes to be, packers will take a more active role, more money will be generated to be used for beekeeping research and other beekeeping-oriented activities.

But first, the referendum has to pass. Those who vote must be a majority, and represent a majority of the honey produced by those voting, for the referendum to pass.

It is the position of this magazine that the money invested in supporting the activities of the NHB has been wisely, and frugally spent in the last 10 years. And, that the NHB should be continued. Too many valuable programs are in progress to stop the Board, and too many plans are in place to disrupt the system.

The NHB is a good thing for the industry. Support it. Vote for it. Enough said.

•

There has been, of late, considerable attention to the plight of the honey bee. I'm not sure if the radio guy with the tie collection has noticed, but all manner of stories have been out, or were anyway, on the situation.

The Cleveland Plain Dealer (no small newspaper) did a front page color spread in early June, followed by National Public Radio, The Philadelphia Inquirer and a host of others. Loss of bees, pollination shortages, wildlife concerns and honey prices were the topics covered. Lots of these were (are) rewrites of some of the originals, but the theme has been the same.

The trick, of course, is to keep that flame alive. Keeping anything alive, in the "what's news this morning" media environment we live in is difficult. Maybe impossible. The obvious follow up to lost bees is lost honey crops, and higher prices, and that needs to be made known about harvest time. Too, reduced fruit and vegetable crops, documented reductions, need to be made known at harvest time. And any loss of wildlife habitat, food sources or the like should be documented and made known. That's difficult. Real difficult.

But if you have the chance, and some information to show (NOT opinion, NOT what somebody else thinks, but something you can document or show or explain), use the opportunity to "enlighten" the press (local newspaper, radio or T.V.) about what's going on. There's lots going on. It's news. Let them know.

•

Finally, a blatant sales pitch. On the back cover this month is our "What Kind Of Bee" information sheet. We printed thousands of these to, yes, sell, to anyone interested. They are available from our parent company for $9.95 for a package of 50. They are great for associations to use at fairs or wherever, and if you work schools these are perfect.

If you have to answer the question "What Kind Of Bee" these are what you want. We priced them as inexpensively as we could, (20¢/sheet) but they were produced at some expense, have value, and show what they are supposed to show. At least we think so.

But, and this is an even more blatant pitch, this is what *Bee Culture* does – provide solid, practical information in an easy to use format. We hope you can use it, and we're proud to provide it. Give us a call.

•

They are, I'm told, nearly finished, with the A.I. Root Company's World Wide Web site. Which may be meaningless if you are computer- or modem-less and don't partake of the whole world of digital beekeeping. Nevertheless, *Bee Culture* has a few pages on the site, but plans include a few more to be added soon. Be patient.

What's there now is this month's cover (or maybe last month's if it hasn't been replaced yet), the table of contents for July, three current articles, plus articles from last month.

There's not lots of art, yet, but lots on the way to use as you please, and there is a list of resources you won't believe in the works, too.

I suppose I should mention that there's lots of information on the church and decorative candles produced here, but they're just candles. The magazine's the real meat here (Don't tell my boss I said that!)

If you can, try it out. The address is – http://www.airoot.com

Kim Flottum

The National Honey Board; News Alive; A Couple of Ads

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KEEP IN TOUCH

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MAILBOX

Another Voice In Canadian Research

Dear Editor,

In the May, 1996, Bee Culture, Dr. Mark Winston of Simon Fraser University in British Columbia, Canada, laments the "Death of Canadian Research." He tells of the many practical research subjects investigated on behalf of North American beekeepers during the past few decades by Canadian researchers. Like many other former commercial beekeepers in Canada, I appreciated the efforts and information disseminated by scientists like Tibor Szabo who investigated bee culture from the unique perspective of the far north - extremely long, cold winters; intensive brief honey flows; granulation problems from Canola honey. However, Dr. Winston does not acknowledge that the Canadian research community has a very dark and unfortunate side and that many of the most practical advances came not from salaried researchers but from beekeepers whose private research resulted directly in their continued success or imminent failure as beekeepers.

Commercial beekeepers such as Don Peer, of Nipawin, Saskatchewan, helped pioneer the successful use of two-queen package systems and over-wintering techniques. Beekeepers in the Peace River region of northern Alberta and British Columbia first learned how to develop powerful colonies to reap hundreds of pounds of honey per hive and then learned how to handle granulation and storage problems. These people, arguably, had a much stronger vested interest in the accurate implementation of their "research results." Much credit must be given to their efforts in creating the extremely robust and viable beekeeping industry which existed in Canada until 1985.

The serious omission in Dr. Winston's article relates to the Canadian research community's response to the presence of mites in American bees and what their collective recommendations did to our industry. I attended many of the meetings where Canadian beekeepers were persuaded by extremely weak and poorly constructed arguments that closing the border to American packages and queens would be better than continuing with the risk of importing bees which may carry tracheal mites or *Varroa*. Our counter arguments- that wintering would be extremely expensive; that the mites would slowly cross the border anyway; and that low levels of mites in treated packages would not develop into debilitating populations before the end of the four month package season- were ignored in favor of what occasionally became blatant anti-American rhetoric at the meetings. There was a certain atmosphere present, especially among many members of the regulatory and research community, that closing the border and killing the Canadian honey industry, would "teach the Yankees a lesson." This is a comment I heard frequently in 1985.

Some Canadian research was conducted on the effects of mites. A handful and statistically meaningless number of colonies in New York state were investigated by a Canadian and the results widely published. A Saskatchewan government effort to study tracheal mites accidentally brought Varroa into Canada. Meanwhile, American beekeepers pioneered methods of dealing with these pests and commercial beekeepers have continued to prosper in the USA.

The result? Canadian researchers, who thought they had little to lose, succeeded in closing the border to USA bees. Wintering was not a resounding success in Canada. Our efforts at queen breeding required that we sacrifice many honey producing colonies to make up for winter losses. In the western provinces, a third of the beekeepers quit, or went bankrupt. There are far fewer bees in Canada than there were ten years ago; blueberry and canola certified seed producers must go without adequate pollination; and, honey exports are down. As it turns out, the researchers had a lot to lose. They no longer have a robust industry to support their activities - some of which would ultimately destroy our industry. It will be difficult for Dr. Winston to garner much financial support from the hands which were bitten off ten years ago.

Ron Miksha
Calgary, Alberta

Agrees With Law Revision

I agree with Susan Cobey, the 1922 Bee Law needs revision. It was a good law in its day, however, we now have two mites in spite of the law.

The revision of the present law needs a lot of careful thought. The industry doesn't need any new pests or disease, but it does need help regarding bees that are resistant to the mites.

Chemicals in the hive must go as there is a danger of their misuse.

Any importation of either stock or semen for breeding must be under control and evaluated research guidelines by U.S. agencies. Two of our industry organizations should be partners with the two Gov. agencies. If two are working independently of each other and each group reach the same answer the stock could then be released to breeders.

The revised law should have a sunset clause, which limits its usefulness to five or 10 years. This forces the government and/or the industry to take another look at again revising the law or letting it stand as written for another five or 10 years.

1922 to 1996 is 74 years

Continued on Next Page

MAILBOX

without a second look at the law. With today's world wide air travel, we could have some new pest or disease tomorrow which wouldn't show up for some time. I just read about a native hornet in Japan which can kill a colony of bees in a very short time.

Donald Cox
Lima, OH

Do Bees Move Eggs?

Roger Morse's column on swarming in the February issue gave me some problems.

He reports that the queen deposits eggs in queen cups. Has anyone actually seen this happening? We watch queens in an observation hive go head first into a cell to inspect it before laying an egg. We are told she measures the cell size and, if it is worker size, lays a fertilized egg. But if it is drone size, she lays an unfertilized egg. What should we expect then if the cell is even larger, and less deep, as is a queen cup? I have found more than once sealed queen cells in an irregular clump back to back on opposite sides of a comb but have never seen queen cups in such an arrangement.

Roy Thurber in *Bee Chats, Tips and Gadgets* reports having seen worker bees moving eggs. Once I had a super of foundation above a queen excluder on which four sealed queen cells were located, two on each side. Not the slightest amount of drawing had occurred on any of the 10 frames but here were these queen cells. It doesn't seem reasonable to ascribe this event to other than worker bees moving the eggs. I suspect the same thing happens with eggs in queen cups. If, indeed, queen cells are *ever* raised in queen cups.

I prefer Roy's explanation of why bees make queen cups. "They do it to hassle the beekeeper," Roy wrote.

Dan Hendricks
Mercer Island, WA

Coaxer or Excluder?

Which is better, the coaxer or the excluder?

Some 80 years ago the coaxer frame was used to get bees to move up faster into the super by placing on early in the spring. It was placed above each new super as needed. This miniature frame, and foundation is only three inches deep. I think it has a better use as a queen barrier than using an excluder to keep the queen below. I usually add on a deep next for their winter stores which takes longer to fill before removing the excluder. When it is time to remove your honey, the coaxer can be extracted along with the rest or left on top of the winter stores till next spring. The excluder is best used to confine the queen to raise less brood near the end of honey flow. Then remove the excluder going into the winter months.

Erwin Steele
Buckley, WA

Do Bees Think?

Propolis - Not Quite Forgotten, by Dr. Roger Morse, Pg. 28-29, January, 1996 is interesting in that facts about a relatively unknown hive product are discussed.

Somewhat at odds with the gist of the article is the paragraph on honey bee thinking.

I wonder if honey bees really do think in the sense that we humans do. Our thought processes are supposedly an orderly and logical process of reasoning. Observing a bee's behavior during such acts as propolis gathering may appear to be an exhibition of selectivity (propolis over caulking compound or other unsuitable material). In reality, could this be merely chance, a more abundant and attractive material than the substitute, seized at instant of first contact, driven by a need of the moment?

In respect to a bee's ability to "think through" the selection process of finding a new home by "an hour of walking around," here again I wonder just how much, if any, true thought we practically ignore the real possibility that swarms sometimes inhabit second-rate abodes when better may be available elsewhere.

It is a physiological fact that bees have brains but to attribute directed behavioral processes in bees or any other organism other than developmentally advanced life-forms is, to my belief, somewhat misleading.

The difficulty, I suspect, is that confusion exists in our understanding of what may pass for "thinking" in the lower animals. Emotions are closely allied with human thinking as are the influences of heredity and environment. Human behavior, rational and irrational, is linked to our capacity to think. Essentially, bees lack emotion and have only limited capacity to react to the environment, thus leaving heredity as the principal guide to bee behavior. As yet our understanding of heredity is incomplete so we tend to compensate for this by attempting to explain the phenomenon of what makes nature "tick" by attributing such distinctly human traits as thinking to honey bees.

Larry Goltz
Redding, CA

Mite Solution Alive and Well

In spite of rumors to the contrary, Steve Tuttle, President of Tuttle Apiary Labs was never indicted, fined, nor imprisoned. We are selling an unregistered "exempt" miticide under FIFRA Sec. 3, (a), which clearly allows for safe miticides to be advertised, distributed and sold.

The EPA however, has not implemented the internal machinery to allow a safe pesticide to be sold in spite of the fact that millions of dollars were spent setting up a department expressly for biopesticides, which are inherently safe for the environment. Mite Solution is a biopesticide, it is made of natural plant extracts, and does not present any "unreasonable adverse effects on the environment." Its active ingredients are approved for human consumption by the FDA as an additive to food.

The EPA knows this, since Tuttle Apiary Labs applied for registration and submitted studies and tests for the product Mite Solution, but were repeatedly told that "all pesticides have to be registered." As a result of the data provided by laboratories, the EPA determined Mite Solution to be both safe for the environment and effective in killing mites.

However, a bee inspector in

MAILBOX

Michigan was not informed, and he set into motion the government protocol which is to FAX to every news agency they thought may be interested a brief and nasty "News Release." In it the EPA stated that they were seeking fines for violations, with pending prosecution, etc. Only the government could get away with such malicious diatribe and half truths.

In fact they sent two federal criminal investigators to my home, to tell me what the charges were. I read them the law, they studied the letters and FAXs from the EPA and agreed that I was indeed within the law. Before they left I *ate* some Mite Solution and told them that I would like them to take me to court so that this whole thing could be settled and out in the open.

Now, the EPA is in the process of a "rule-making," and will get back to me "ASAP." We're just afraid that at the rate the mites are killing bees, half the potential benefactors of this product will be out of business. If you would like more information you may call me at (360) 225-9631.

Steve Tuttle
Woodland, WA

Rossman's Say Thanks

We'd like to take this opportunity to say a big "Thank You" for the understanding and patience afforded us by our customers during the spring of 1996.

This year has been a very different year to say the least. Demand for package bees has been at an all time high and Old Man Winter would not let his hold on the season go. Bees in the south could not build up fast enough to stay up so shipping delays had to be initiated. Delays are something that we are not accustomed to and do everything in our power not to have.

Again we would like to say "Thank You" to those who have helped us endure the "Spring of 1996."

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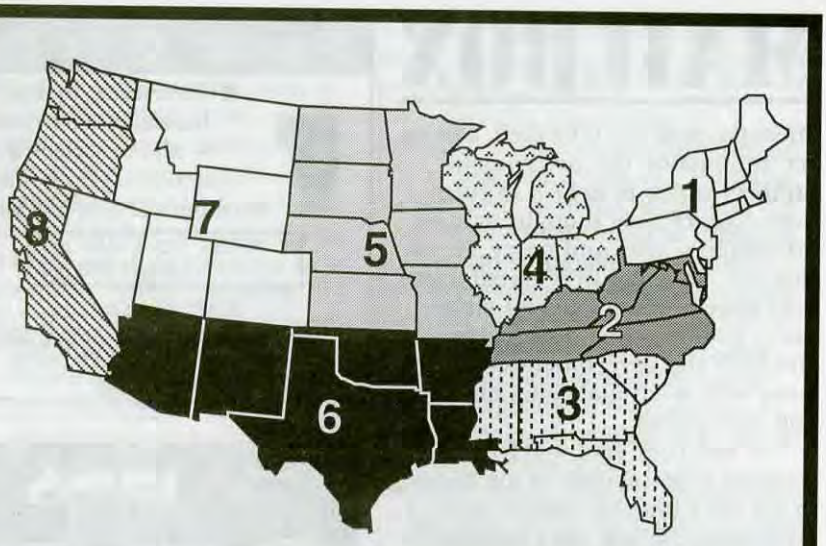
JULY Honey Report

JULY 1, 1996

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	45.61	63.00	60.50	57.53	59.40	42.88	45.00	52.50	39.00-85.00	57.35	54.72	46.68
60# Amber	44.19	59.60	59.00	57.03	58.50	39.88	43.00	51.00	36.00-75.00	55.40	51.71	44.47
55 gal. Light	0.82	0.77	0.83	0.99	1.00	0.62	0.75	0.83	0.53-1.23	0.86	0.81	0.61
55 gal. Amber	0.76	0.63	0.77	0.88	0.96	0.73	0.65	0.79	0.50-1.08	0.80	0.77	0.58
Wholesale - Case Lots												
1/2# 24's	26.91	34.10	26.00	25.43	23.28	24.50	23.15	26.50	22.80-48.00	27.50	24.97	23.45
1# 24's	35.84	38.67	36.00	38.42	36.53	33.70	32.10	35.80	32.10-45.90	37.07	34.69	33.40
2# 12's	33.54	36.53	37.00	36.51	32.60	29.00	30.95	30.00	29.00-47.76	34.74	32.68	31.69
12 oz. Plas. 24's	31.55	34.54	33.00	32.66	29.39	30.00	30.25	29.33	24.00-45.90	32.58	29.98	28.25
5# 6's	34.34	34.92	36.00	37.13	34.63	32.50	30.95	33.10	30.95-45.95	35.79	33.91	32.66
Retail Honey Prices												
1/2#	1.71	2.14	2.00	1.48	1.34	2.19	1.29	1.69	1.19-3.50	1.73	1.70	1.46
12 oz. Plastic	1.93	2.09	2.11	2.10	1.64	1.99	1.75	1.79	1.39-2.96	1.98	1.97	1.74
1 lb. Glass	2.35	2.52	2.92	2.15	2.15	2.32	1.98	2.51	1.69-3.69	2.40	2.23	1.95
2 lb. Glass	3.93	4.30	4.73	3.98	3.45	3.50	3.25	3.54	2.97-6.69	4.01	3.81	3.21
3 lb. Glass	5.09	5.75	6.10	4.95	4.86	4.65	4.50	5.03	3.50-7.89	5.28	4.94	4.34
4 lb. Glass	5.74	6.48	5.75	7.50	6.37	5.77	5.45	6.70	5.45-7.50	6.16	5.85	5.66
5 lb. Glass	7.65	8.00	6.75	8.69	8.19	6.72	6.65	7.79	5.89-11.94	7.92	7.09	7.12
1# Cream	2.82	3.33	3.28	2.40	2.60	2.88	3.15	2.66	2.00-4.95	2.89	2.82	2.78
1# Comb	3.52	3.65	3.00	3.87	2.50	4.13	4.50	3.50	1.95-4.99	3.74	3.73	3.49
Round Plastic	3.35	3.75	4.00	3.13	2.80	4.50	3.68	3.62	2.50-5.00	3.53	3.51	3.01
Wax (Light)	2.31	1.85	2.38	3.19	2.05	1.87	1.75	2.56	1.25-4.05	2.37	2.34	1.91
Wax (Dark)	1.87	1.56	2.00	2.29	1.60	1.48	1.70	2.14	1.00-3.25	1.94	1.84	1.51
Poll. Fee/Col.	32.02	30.00	36.67	32.50	40.00	10.00	35.00	33.63	10.00-55.00	33.66	33.06	31.25

MARKET SHARE

Last year a 60 of light was selling, on average for $46.68 ($0.78/lb.), last month for $54.72 ($0.91), and this month $57.35 ($0.96). Suddenly that white pail in the basement has some real value. Even if you don't bottle, don't wholesale and don't know what to do with it, now's the time to find out. Packers want it, you got it. And if you're selling retail, when was the last time you raised prices?

Region 1

Prices rising, especially at the case wholesale and retail level, but supplies way, way down. Demand about average for summer sales. Colony conditions seem pretty good, even with wet, cool spring.

Region 2

Prices up pretty much across the board, especially wholesale. Demand mixed, but still strong. Supplies light to none early but earlier than-usual crops will mean early harvest. Colony conditions good so far. Many recovering from last season.

Region 3

Prices steady, but some products up, some down. Early crops helping supply, and demand moderate to heavy for these – especially citrus. Colonies in good shape, but erratic weather in spots has hurt build-up and slowed some flows.

Region 4

Prices slowly rising, but demand only steady, except at barrel quantities. Retail and bakery only steady demand. Some resistance to prices at these outlets. Colonies went through cool, wet spring with mixed results. Strong colonies swarm, weak slow to build. Some early flows lost to rain.

Region 5

Prices steady to up just a bit but some say ceiling in sight, others say not. Demand typical for summer – slow to moderate, even at industrial level. Colonies slow to build in spring – cool and wet, and many replacements not taking off.

Region 6

Retail prices climbing, but wholesale still only steady. Demand for new crops increasing, but overall demand slow. The weather has been the key. Easy dry spell hurt, later storms too much, too fast. Prospects for remainder of season mixed.

Region 7

Prices rock steady at both retail and wholesale, but demand down and supplies short. Dry weather has slowed or stopped early crops. Irrigated areas O.K., but slow.

Region 8

Prices steady to dropping a bit, but primarily due to slowing demand, and low supplies. Colony conditions mixed – very dry in the south, wet and cool in north – have slowed buildup. Many moving east to take advantage of a hoped-for flow there.

What's New For You?

Bee Economics is a computer model for economic analysis of beekeeping operations. It consists of several modules that are linked together so that information entered in one module flows to appropriate sections of other modules. The modules included in Bee Economics are Bee Planner, Record Keeping (Investment, Expense, Revenue and Cashflow) and Enterprise Analysis. These modules can be used to analyze a current beekeeping operation or can be used for effective forecasting in the future and under alternative scenarios.

The minimum requirements to use Bee Economics on an IBM compatible machine are a 386 machine, 4 megs of RAM, Windows 3.1, and Microsoft® Excel 4.0. The minimum requirements to use Bee Economics on a Macintosh machine are 4 megs of RAM and Microsoft® Excel 4.0. It is important to have a basic understanding of Microsoft® Excel before using Bee Economics.

Bee Economics was developed by Lois Schertz Willett, Department of Agricultural, Resource and Managerial Economics, Cornell University; Nicholas W. Calderone, U.S. Department of Agriculture, Agricultural Research Service, Bee Research Laboratory; and Malcolm T. Sanford, Entomology and Nematology Department, University of Florida.

Any comments or questions can be addressed to Dr. Lois Schertz Willett, Department of Agricultural, Resource, and Managerial Economics, Cornell University, Ithaca, NY 14853-7801, (TEL) 607-255-4489 (FAX) 607-255-9984 or (Email) lsw2@cornell.edu.

Bee Economics sells for $39 plus $5 shipping and handling. Income from sales of Bee Economics goes toward future economic research on the beekeeping industry. Copies may be purchased from the American Association of Professional Apiculturists, Dr. Marion Ellis, AAPA Secretary, University of Nebraska, Department of Entomology, 210 Plant Industry Building, Lincoln, NE 68584-0816 or ordered via the AAPA Home Page at http://ianrwww.unl.edu/ianr/entomol/beekpg/aapapubs.htm.

The Four Seasons Of Charlie Mraz, 60 min. video $19.95 + postage, Honeybee Health Products, P.O. Box 4326-C, Burlington, VT 05406. 800-603-3577.

The Four Seasons Of Charlie Mraz follows this well known beekeeping figure for a year in his Vermont home. Charlie shows the basics of pollination, honey production, summer time, fall and winter preparations and the blush and bloom of spring. In the trips to his home yard he explains his basic management schemes, showing what he does, and why. You'll learn some beekeeping here, from somebody who has been at the craft for over 70 years.

But there's certainly more to this hour long visit than Charlie dispensing bits of beekeeping wisdom, because there is much more to Charlie Mraz.

The golden moments spent in Charlie's living room, where he talks of his history, his early experiences with the effects of using honey bees to help people, and the broader world of apitherapy are as easy as being with him. You can almost smell the tea, and the wood fire.

There's a short demonstration of apitherapy application, and stories from a few of those who have been helped by the sting of the honey bee.

This tape is a gentle and artful look into the life of the Father of American Apitherapy, who happens to have been a successful commercial beekeeper and queen producer. It will not show you how to find a queen in a full-to-the-top colony of bees, but it records for all concerned the best of one of America's beekeeping personalities. Knowing this, you will not be disappointed. Knowing this, you will be glad you have spent the four seasons of Charlie Mraz.

Weeds Of The West. Published by The Western Society of Weed Science, in cooperation with the Western United States and Land Grant Universities Co-op, Extension Services. Fifth Edition. 630 pages. Soft cover. Color throughout. ISBN 0-941570-13-4.

Don't be fooled by the title of this book. Most of the hundreds of plants displayed in this book are found throughout the U.S. Granted, some are strictly found in the west, and some eastern U.S. weeds aren't here, but they are by far in the minority.

Fifty-one families of plants are covered, with over 300 plants identified. Each full color description includes a photo of the full plant, it's flower and a seedling, making identification of any of these easy. The photos are excellent, and the short description accompanying each describes the plant, where it is found, when it blooms and common names. The scientific name is always provided.

There is a Glossary of descriptive terms, used to identify plant parts, shapes or growing habits, and an easily used, through general key to help identify plants you aren't familiar with. Also included is a list of references for further study, and an extensive index.

Available from Western Society of Weed Science, Newark, CA, or DeYoung Nursery, Box 76, Rt. 1, Stark, KS 66775.

Roger Morse

Research Review

"There are some who think honey bee populations should be controlled because they have an adverse effect on the environment."

Honey bees are foreign to North and South America and Australia. Several people with an environmental orientation have questioned whether or not honey bees may have a detrimental influence on the populations of native solitary ground- and twig-nesting bees and the social stingless bees that live in areas where they have been introduced. The matter is coming to a head in Australia, where some environmentalists want to deny beekeepers access to certain of the national forests where Eucalyptus are a major source of nectar.

The *Australasian Beekeeper* reported in last October's issue that beekeepers, farmers, loggers, sawmillers, irrigators, recreational fisherman, horse riders, sporting shooters and others protested in the street in front of Parliament House in Sidney in New South Wales. All of these people had the same concern, and that is their continuing to have access to the national forests, which would apparently be denied them by policies and actions by the new resource minister of New South Wales.

American Reaction

Three American solitary bee specialists have recently expressed opinions on the Australian situation. This causes me to review the subject and suggests that we might be faced with some of the same thinking in this country in the near future. The purpose of the American study was to review the science of the matter and "to draw some general conclusions and to provide an overview from which proactive solutions" may be formulated.

The article by the Americans has as a basis the fact that honey bees harvest large amounts of nectar and pollen. They write, "Nectar, especially, is of special value as a rich energy source in nature, one on which many animals depend."

Recommendations

Examples of how beekeepers might improve the present situation according to the American writers included "the use of lightweight trucks in migratory operations and better colony growth management and swarm control." Another suggestion is that in the United States, Bird's-foot Trefoil "might benefit from honey bee pollination, while providing a high-quality nectar source." They also write that, "Recent technology has made moderate-scale feral colony removal experiments a practical possibility." Beekeepers are also encouraged to investigate the use of other species of bees, such as bumble bees, for pollination.

Opinion

The part of this paper that suggests that honey bees suppress the populations of solitary and other social bees is well documented and, I think, correct. My personal experience in collecting bees other than honey bees is that they are far more abundant in the mountainous areas I have worked where there are no honey bees.

However, an inescapable fact is that the people population on Earth is growing. These people must be fed, and this means we need to support efficient agriculture. I work at a college of agriculture where one of our important goals is to make certain that people are well fed. We have done a good job insofar as agricultural research in this country is concerned. Food in the United States is delicious, nutritious, abundant, diverse, safe and cheap. All of these things are more true in this country than in any other because of efficient modern agriculture.

I find several of the suggestions by the Americans interesting, but others are objectionable, and some are not practical. The use of lightweight trucks, for example, means more labor for the same amount of work. The statement that Bird's-foot Trefoil might be a useful nectar source is not correct. Bees visit it, but it is not a good source of pollen or nectar. Curiously, Bird's-foot Trefoil is an introduced plant, but that does not appear to be of concern. The idea that we might trap away feral colonies is not based on good technology. Trapping colonies is costly, time-consuming and not efficient.

For the moment, my opinions are not important. What is important is that there are fewer and fewer people who work with plants and animals, especially fewer farmers (and beekeepers). There are fewer than two million farms in the United States. As a result, some people think food is made in a grocery store. This subject of honey bees and their effect on the environment will not go away soon! BC

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Editor *In the apiary.* The Australasian Beekeeper 97: 150, 152. 1995.

Sugden, E.A., R.W. Thorp & S.L. Buckman. *Honey bee-native bee competition: focal point for environmental change and apicultural response in Australia.* Bee World 77: 26-44. 1996.

? DO YOU KNOW ?

Summer Management

Clarence Collison

The primary purpose of summer management is to insure that the bees have adequate space for brood production and honey storage. In addition to insuring that adequate space is available for the bees, you should also check on the overall condition of the colony and conditions which might affect it. Inspections for disease and mites plus the condition of the brood area, (performance of the queen), should be considered when you have the colony open. Summer is also a time when pesticide problems may occur. Other potential problems could result from attacks from skunks, bears, ants, wax moth etc. Specialized management will also be requiredif you are producing products such as comb honey, and pollen.

How well do you understand summer management and potential problems that can affect colony performance? Please take a few minutes and answer the following questions to determine how well you understand these important topics.

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

1. ____ Cold nights often increase the persistence of spray residues thus increasing the hazard to bees the following day.
2. ____ A queen excluder is normally used in the production of cut comb and section comb honey.
3. ____ Standard 10 frame wide hive bodies (supers) are normally used in the production of section comb honey.
4. ____ Honeydew is produced and secreted by extrafloral nectaries.
5. ____ Worker honey bees over four weeks of age cannot lay eggs if the queen is lost.
6. ____ Only queens that have gone on a successful mating trip are capable of laying eggs.
7. ____ "Purple brood" is a bacterial disease of honey bees.
8. ____ Field bees are most often killed by pesticide applications.

Multiple Choice Questions (1 point each).

9. Wooden comb honey sections are made from _____ trees.
   A. Fir
   B. Pine
   C. Maple
   D. Basswood
   E. Cypress
10. Round plastic honey comb sections were designed and developed by _____.
    A. R. W. Cobana
    B. W. S. Zbikowski
    C. J. S. Harbison
    D. A. I. Root
    E. John Hogg
11. The active ingredient in Bee-Go is _____
    A. Amitraz
    B. Benzaldehyde (oil of almond)
    C. Formic acid
    D. Fluvalinate
    E. Butyric anhydride
12. Name three different ways pesticides enter and poison bees. (3 points).
13. What are the two common honey super depths used for section comb honey production? (2 points)
14. What is the primary impact herbicides have on honey bee colonies? (1 point).
15. What is the danger of systemic insecticides applied to plants prior to the time of flowering? (1 point).
16. Name two insecticides (acaricides) currently registered in the United States that can be used legally inside of beehives. (2 points).
17. Name two disadvantages of bottom supering colonies (2 points).
18. What is the primary function of the following pieces of equipment? (3 points)
    Fume board
    Drip board
    Follower board

ANSWERS ON PAGE 430

Mark Winston

Bee Metaphysics and Mr. Spock

Do people send you things about bees all the time? I can't begin to count all of the cartoons, photographs, mugs, honey jars, toys, stuffed animal bees, honey samples, stickers, ashtrays, patches and jokes I've been given over the years that have something remotely to do with bees or honey. My office is festooned with this memorabilia, from the large drawing a friend did that says "Comb Sweet Comb" to the stuffed animal and the mug my daughter and my wife gave me this Valentine's Day, each of which has "Bee My Honey" written prominently on it.

Most of these items are cutesy, jokey kinds of things, but there is a more serious side to people's fascination with bees that moves into the areas of philosophy, religion, metaphysics and even New-Age flaky. A friend recently sent me an interesting photocopy of the "bee" entry from a book titled "*A Dictionary of Symbols*," by Jean Chevalier and Alain Gheerbrant, which reminded me of this other stream in human thinking about bees. The bee section begins with: "Numbers, organization, unwearied toil and discipline would all make the bee no more than another ANT - the symbol of the masses doomed to endure their fate - were it not that it has wings and a song and distil's immortal HONEY from the delicate scent of flowers. This is enough to add a powerful spiritual dimension to the bee's purely material symbolism. Working in their HIVE, a home buzzing with activity and which is naturally equated with the airiness of the artist's studio rather than with the gloom of the factory, bees collectively ensure the survival of their species. Yet taken as individuals, a universal quickening power between heaven and earth, they come to symbolize the vital principle and to incarnate the soul."

My first reaction was probably the same as yours: Give me a break. I mean, bees as the quickening power between heaven and earth, immortal HONEY, delicate scent of flowers, the hive as an artist's studio? When was the last time you attended a bee meeting when a speaker lectured about bees in such an ethereal way? I'm sure virtually every beekeeper in the room would head for the hallways for a smoke or coffee break to talk about the latest way of illegally using miticides until this flaky speaker was done connecting bees to the eternal cosmos.

That might be the reaction of those of us used to thinking about bees in a functional way, focused on biology or management, rather than as a part of the grander universe. To many people, however, bees have enormous spiritual, religious and philosophical importance, and both bees and honey have been a part of human thought for millennia. Indeed, there is a long historical tradition that considers bees for their spirituality rather than their utility, and bees have appeared in the great books and writings of virtually every major religion.

Take Islam, for example. Muslims say that true believers are like bees that have chosen the fairest flowers to visit for nectar, and in one Muslim tradition, bees are considered to be angels. The ancient Egyptians believed that bees were born from the tears of the sun god Ra falling to Earth, and the great Greek philosopher Plato thought bees to be the souls of the righteous that were reincarnated. Even mainstream Christianity has gotten into the spiritual side of bees. Medieval Christians thought that the buzz or "song" of the bees embodied a spark of the divine, and considered the three-month Winter season when the bees don't appear outside the hive as representing the three days after Christ's crucifixion, when his body vanished.

Bees not only have been used to symbolize the spiritual side of things, but also have been used to represent eloquence, poetry and the mind. It was thought that St. Ambrose's eloquent sermons and musical ability were due to bees touching his lips while he was in the cradle. Indian writers waxed eloquently comparing bees visiting flowers to the soul sucking on the intoxicating pollen of knowledge. In Hebrew, the term for "bee" and that for "word" come from the same root, and bees or honey are mentioned innumerable times in the Old Testament.

People unfamiliar with bees have a real fascination with them that goes beyond simple interest in another species. My city has a science mu-

"To many people, bees have enormous spiritual, religious and philosophical importance, and both bees and honey have been a part of human thought for millennia."

seum with a glass-walled observation hive, and it invariably has a huge crowd of children and adults surrounding it. Some of them are doing something specific, like trying to find the queen or see a bee dancing, but others get a transfixed look on their faces, and are absorbed in the activity of the hive without trying to find anything in particular. They look and act as if they were meditating, and if jerked back to the present by a question or bumped by their neighbor, they seem confused for a minute, as if they had forgotten where they were.

I've seen this same reaction in students unfamiliar with bees who view the inside of a hive. It seems to happen the second or third time they work bees rather than at the time of their first experience, which is taken up more by fear of stinging and figuring out the mechanics of veils, smokers and hive tools. Once they're comfortable, however, a detached focus comes over their faces, the chatter stops, everything seems to slow down, and they become absorbed in the nest. "Cool" is the way they describe it, but I think they mean much more.

I know what they mean, because I've felt it, and you probably have, too. Not those days when you're in a hurry, have a few hundred hives to feed and have to get home to take your daughter to ballet or your son to hockey practice (Oops; I meant to be more politically correct: your son to ballet and your daughter to hockey practice). No, this feeling of connection with the bee world comes on slower days, perhaps during the honeyflow, when you're going through the occasional hive just to see what's going on. There comes a moment when you pause, and deeper senses than just sight, sound and smell kick in, and in some intangible way, give you a feeling that something else is there with you. That "something else" is nothing bizarre, odd or even alien; it's just a bee colony, but in those moments, the sense of what it feels like from the bee's point of view takes over from our human perspective.

I can remember when this first happened to me, the privilege of sharing a few moments with another species. I had just arrived in South America to begin my Ph.D. research on Africanized bees, and had virtually no experience with honey bees at all up to that time. I approached my first hive, a small nucleus colony, and I was suited up head to toe for protection, since I had only the bee's reputation as a guide as to what might happen. I smoked the colony until I couldn't see the bees for all the haze, and then gingerly went in to take off the top, as if I were disarming a bomb rather than looking at some bees.

Of course, nothing remotely frightening happened. The colony was small, and even if they had wanted to come after me, they were so heavily drugged by the smoke I doubt they could have found me. As I went through the frames, a strange sensation came over me, and to my astonishment, I realized that the way I felt was the last thing I had expected while working a colony of "killer bees": I was relaxed, and peaceful.

This calm feeling soon expanded to the point that I took off my gloves and veil and forgot what I was supposed to be looking for in the first place, which was probably the queen or something mundane like that. Rather, I felt an attachment to the bees in some way I still can't explain, much like someone might feel the first time he meets a natural soul mate, and immediately hits it off. For a few moments, at least, I thought I knew what life must be like from the bees' point of view, walking around together in the hive, smelling the smells, sensing the vibrations, touching their antennae, caring for their young.

Soon it was time to close up the hive and move on, and I certainly don't click into similarly poetic bee experiences every time I open a hive. There's usually too much to get done, too many details to explain to a student, or simply too many heavy supers to lug around, and I don't have the time or focus to slip into la-la land. It does happen, however, and although few of us talk about it, I have a feeling it happens to you, too.

If so, you're part of a long human tradition that considers bees worthy of religious experience, and honors this species by imagery and respect for what bees can symbolize to us. This is not like learning to feed sugar syrup, or figuring out the right time to super, or finally getting all of your disease and pest control down right. This is a way of understanding bees that can't be taught, isn't discussed in *The Hive and the Honey Bee* or *The ABC's and XYZ's of Beekeeping*, but can only be experienced by letting yourself go into the world as bees might see it. It's a bit like Mr. Spock might feel doing a Vulcan Mind Meld with a worker bee, or like Deanna Troi having an empathic experience with the queen. Perhaps the hippies of my generation expressed this connection with bees best in their classic 1960s comment on the world in general: "Like, Wow!" BC

Mark Winston is a professor and researcher at Simon Frazer University Burnaby, B.C. Canada.

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DO YOUR OWN RESEARCH II

DATA COLLECTION AND ANALYSIS

Buzz Phillips

The most difficult aspect of conducting research, any research, is the discipline required for data collection and analysis. Designing an experiment is pretty straightforward, and analyzing the information gained is determined by the way the experiment was designed in the first place.

Our experiment, testing two different amounts of Basil leaves plus a control, for controlling *Varroa* mites in a beehive, is a fairly simple setup, but it explores the basics of fundamental research. We used 10 colonies for each of the three treatments (control, half and full treatment), for a total of 30 colonies at the beginning of the experiment.

All 30 colonies were established from packages and queens from a known source and genetic background, fed, medicated and treated in the same manner starting May 15. A month later, baseline readings were taken (June 15), and once a month thereafter, samples of bees (100-200) were taken from the center of the brood nest and stored in alcohol until they could be counted – both the bees collected and any *Varroa* mites adhering to those bees were tallied.

The hypothesis was that if Basil leaves did indeed control *Varroa* mites in a colony, then colonies not treated at all would have the most mites per sampling period and overall, compared to those colonies with a diluted treatment (1/2 cup), which, in turn, would have more mites than those receiving the full treatment of Basil leaves (full cup).

Our samples were taken on the 15th of each month, and the colonies receiving the Basil leaves were treated right after the bees were collected. Samples were taken for six months, ending the middle of November.

Next, those samples were counted (Please refer to our data collection sheet.) We'll use the August 15 collection as an example. The check mark by the colony number indicates a sample was taken on the date indicated. Bees are *not* counted in the field, nor are mites, but any out-of-the-ordinary factor is noted on the sheet. Colony #3 died since the last collection. The bottles the bees were collected in are labeled with the colony number and date of collection for future counting.

Later, the bottles and data sheets are pulled out; the bees and mites in each bottle are counted and the numbers written in the appropriate spaces.

Since we randomized our treatments, colony #1 and colony #2 probably aren't in the same treatment (although randomizing first and numbering later would solve this), so we need to put like colony information with like. That is, make a new sheet that gathers all the information from a single treatment together. This is called a Data Assembly Sheet.

Of course, we could have done this in the first place, or, using any number of spread-sheet computer programs, let the machine do the work. The method described here is oversimplified to make sure things are clearly explained. At the bottom of this second sheet, notice the "total" and "average" rows. These are important numbers, so we need to calculate them carefully. The "average" is the total number collected, divided by the num-

Treatment 1

	# Bees Collected						# Mites Collected					
Colony Number	6/15	7/15	8/15	9/15	10/15	11/15	6/15	7/15	8/15	9/15	10/15	11/15
2		121	179					3	64			
7		97						11				
16		155						7				
19		100						0				
5		137						17				
21		141						9				
23		156						65				
11		111						41				
13		184						100				
30		163						73				
Total		1365						326				
Treatment Average		136.5						32.6				

Data Assembly Sheet (You need one for each treatment)

DATA COLLECTION SHEET

Date	Hive#	Treatment	Date Treated	#Bees Collected	Mite Count	Comments
8/15/96	1✓	A	8/15/96			
8/15	2✓	B	8/15			
8/15	3✓	C	8/15			Dead
	⋮	⋮				
	30✓					

DATA COLLECTION SHEET

Date	Hive#	Treatment	Date Treated	#Bees Collected	Mite Count	Comments
8/15/96	1		8/15/96	153	16	
8/15	2		8/15	179	64	
8/15	3		8/15	-	-	Dead
	⋮					
	30			204	161	

	Sample Date	6/15	7/15	8/15	9/15	10/15	11/15
CONTROL	Treatment 1 Colony #						
	2	.02	.36	1.51	3.77	6.85	2.3
	7	.	.	.	.	.	.
	.	.	.	.	.	.	.
	.	.	.	.	.	.	.
	30	.	.	.	.	.	.
	Average	.04	1.2	3.6	3.9	5.8	3.2
1/2 cup	Treatment 2						
	3						
	8						
	.	.	.	.	.	.	.
	29	.	.	.	.	.	.
	Average	.03	.07	1.7	2.9	3.2	1.5
Whole Cup	Treatment 3						
	4						
	9						
	.	.	.	.	.	.	.
	.	.	.	.	.	.	.
	28	.	.	.	.	.	.
	Average	.02	.05	1.2	1.6	2.1	2.3

Summary Chart

ber of colonies we collected from. In the example from July 15 1,365 bees were collected from 10 colonies – 1,365÷10=136.5, which is the average number of bees collected per sample for this treatment.

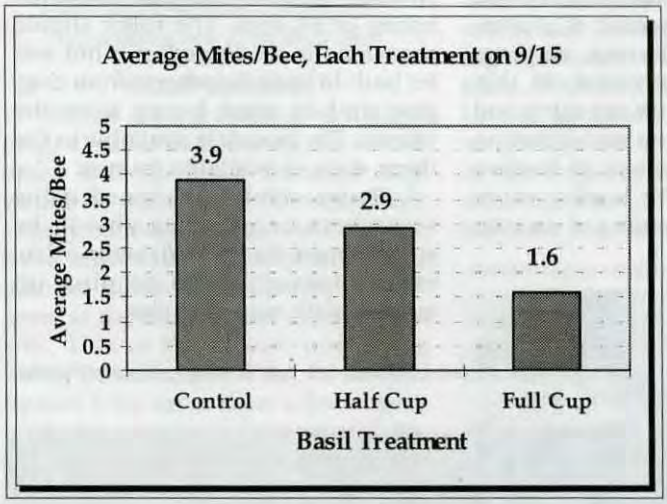
We do these calculations for each treatment, so that when completed, we will have all of our information on three charts, one chart for each treatment. Then we can begin our analysis.

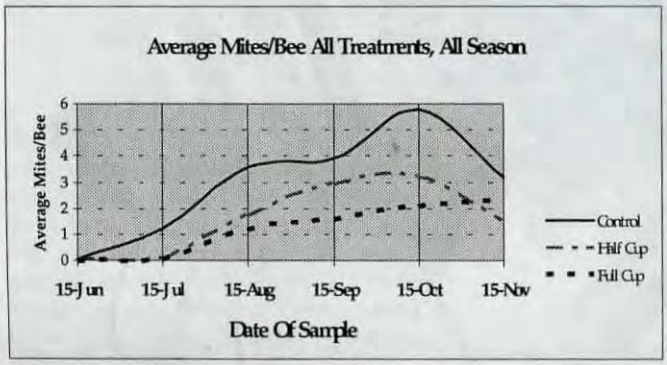
A caution is in order here. Do not be swayed by just your season-long observations. No matter what you are testing, and no matter what your initial thoughts were, rely on the numbers to tell you what's going on. Another researcher needs to know the techniques you used in order to duplicate the experiment. They probably won't have the same preconceived notions (or they may be just the opposite) as you did. Observations are important and should be noted, but if you can't *consistently and accurately measure the event* it won't help you prove or disprove your hypothesis.

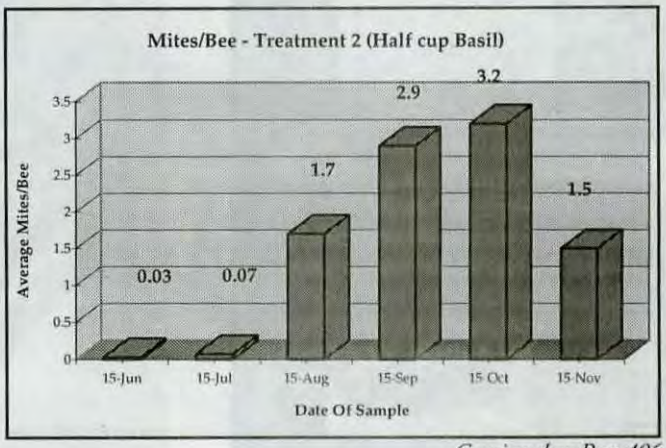
Next, calculate the mite load, which is simply the number of mites divided by the number of bees for each sample. For example, for colony #2, on August 15, 179 bees and 64 mites were collected. Divide 64 by 179 to find .36 mites per bee in that sample. Also, calculate the total mite load for the treatment for a sampling date. Again, look at the Assembly Sheet for July 15. On that date, a total of 1,365 bees were collected from all 10 colonies, and 326 mites were collected. Divide 326 by 1,365 to find the average of .24 mites per bee per treatment on July 15. Do this for every sampling period, for every treatment. But first, make another chart.

A Summary Chart is strictly that. It is made up of all of the mites per bee calculations from your Data Assembly Sheet. When complete, it shows the results of each colony and each treatment for the duration of your experiment.

You may have several Data Assembly and data summary charts from your experiment. You will have one for each aspect you are measuring, and you may, actually should, measure more than just mites per bee when testing your Basil leaves.







Continued on Page 406

TOPPING OFF

A Review Of Uncapping Equipment

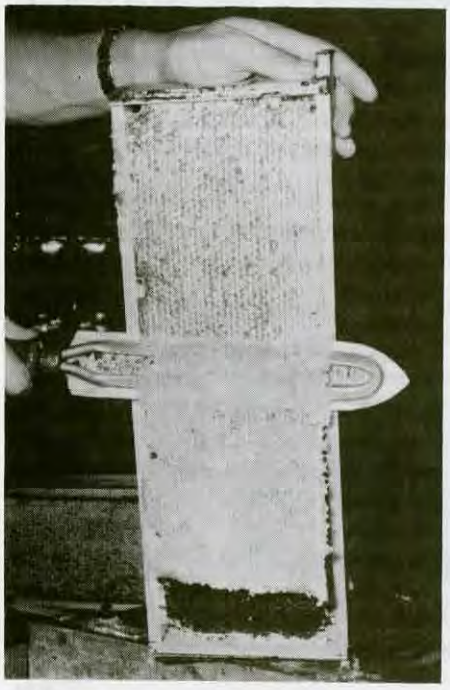
James E. Tew

A new year's crop of honey covered with snow white cappings is one of the beehive's premier offerings. Though many authorities say that crop pollination is the main contribution that honey bees make to human society, a heavy crop of high quality honey is more immediately rewarding to the beekeeper than pollination services. On the other hand, a heavy crop means heavy work - for both the beekeeper and the bees.

Cappings make the nicest wax of any wax rendered from the hive. Cakes of sweet-smelling, yellow wax are the product of melted wax cappings and are always in high demand for candle making, artwork, folk medicines, and woodworking. Handling and processing cappings correctly is important.

The type of uncapping procedure or the device best suited for a particular beekeeping operation will depend on the number of colonies you are working and the amount of time you have to spend processing honey. If you consistently think you're working too much in the uncapping phase of honey processing, it may be time to consider stepping up to the next level of uncapping technology. This review is intended to discuss the options available to all size honey production operations - from the very smallest to the very largest. But what this review is not is an effort to evaluate equipment or to rank uncapping equipment. Colony numbers, extracting room space, equipment cost, and uncapping speed are some of the attributes that you need think about when considering uncapping equipment.

A steam heated knife.



DON'T UNCAP AT ALL

By producing some form of comb honey, the entire process of uncapping, extracting, filtering, settling, and bottling is eliminated. In this case, the wax cappings are eaten and swallowed. Though no real digestion occurs, no harm comes to human digestive systems for having eaten beeswax. An alternative, of course, is to simply remove it.

SCRATCHERS AND PUNCHERS

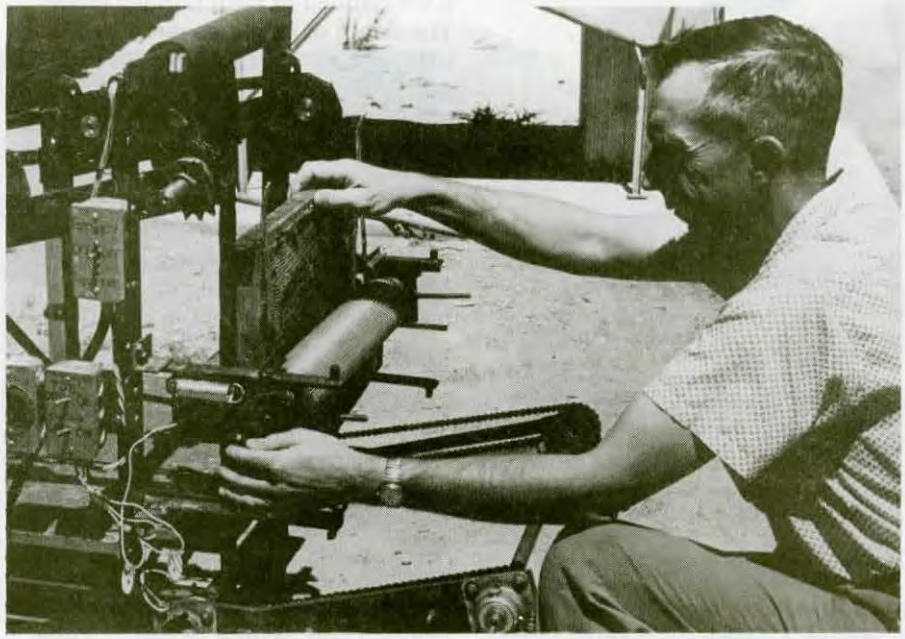
For honey to be centrifically extracted from combs, cappings must be punctured or removed outright. A cappings scratcher is as simple as it gets and would really be a lot work if many frames are to be uncapped. Scratchers are available from bee supply outlets, but a common fork or the ubiquitous hive tool are examples of devices that could be used to tear open cappings. Normally, such simple tools are used to uncap low spots in combs missed by other uncapping devices.

The Hackler Honey Punch looks like a miniature paint roller, made up of individual spiked wheels. Individual diameter and thickness, when combined with the spacing of the spikes, conform to the spacing of the honey comb cells. The roller should occasionally be dipped in a hot water bath to keep the wheels from clogging and to rinse honey from the wheels. The punch is available in the three sizes of available frames.

Honey combs uncapped using scratchers or punches should be spun longer in the extractor. Also, expect honey filters to plug up quicker with wax particles.

A collection of hand-held upcapping devices. Pictured, from L to R: cold knives (4); Hackler Punches (2), scratchers (3), planes (2), electric knives (3).

An uncapping fork. Many sharp tines.



An early USDA invention using tines on a cylinder to puncture capping.

COLD KNIVES

If only a few frames need uncapping, a common kitchen knife will be okay. One having a serrated edge would be even better. However, bee supply catalogs still list cold knives. Such knives have a heavy, diamond-pointed blade, are offset by 90 degrees at the handle, and are inexpensive. This is the classic uncapping knife, but it's still a lot of work if frames from more than a few supers are to be uncapped. Like scratchers, this is a good knife to have at the ready to uncap spots missed by other types of uncappers.

HOT KNIVES

• Hot water heat. New cappings are soft and pliable and will cut easily with a warm knife. Two or three cold uncapping knives can be heated in a (very) hot water bath. As a warm knife is used to uncap, it will quickly cool. It can then be rotated with a fresh knife from the hot water bath. Shake off excess water before using.

• Steam Heat. It logically follows that hot water could be converted to steam which could then be used to steam-heat uncapping knives. In fact, steam has been used on several motorized uncapping systems - though not used very often now. Generally, steam heated knives are little more than a traditional cold knife with a copper tube soldered on the back of the blade. Small amounts of steam can be readily generated using a pressure cooker and a heating plate. Attach a heat-resistant hose to the pressure cooker's "jiggler-weight" spout. Attach the other end of the hose to the knife. Use the smallest amount of hose possible. Exhaust the steam away from you and the honey with a second piece of hose. DO NOT close or pressurize the system. Replace water in the pressure cooker with hot water as needed. Small steam generators are available commercially from bee supply companies.

• Electric Heat. Using electrically heated knives provides simple heat and eliminates the need for steam generating equipment. For many years, Pierce Manufacturing Company has produced "Pierce's Thermostat Knife". It has a sealed thermostat in the blade that holds a steady heat. The knife heats to uncapping temperatures in 30 seconds. Unplug

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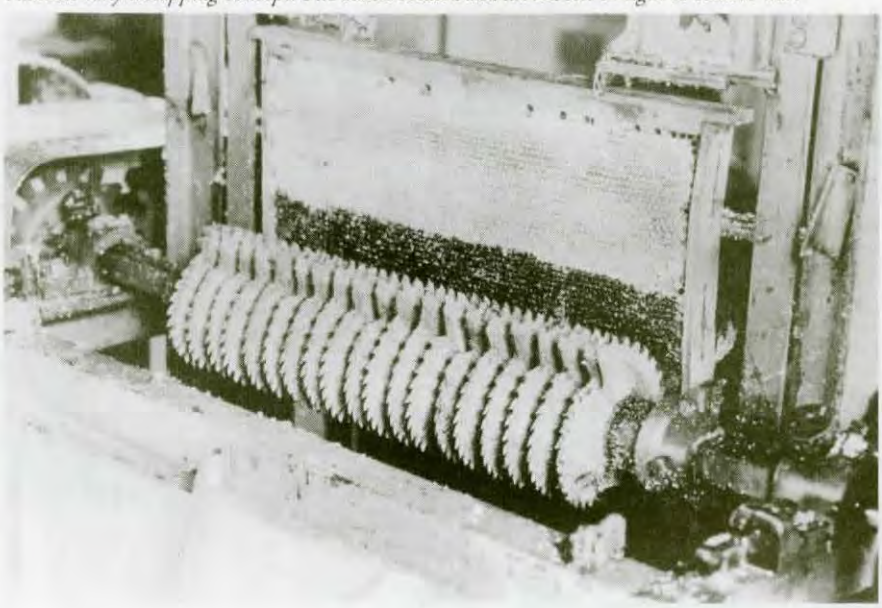
Another early uncapping concept. The blades rotated and moved left to right to remove wax.



One of the original vibrating knives used to uncap. This one sold by The A.I. Root Co.

TOPPING OFF ... Cont. From Pg. 403

the knife when not in use. The Walter T. Kelley Company manufactures Kelley's Electric Hand Uncapping Knife. This knife has a rheostat that coordinates heating rate with the rate of uncapping. Don't use any electric knife as a hive tool and don't submerge electric knives in water - especially while they are connected to an electrical source.

UNCAPPING PLANES

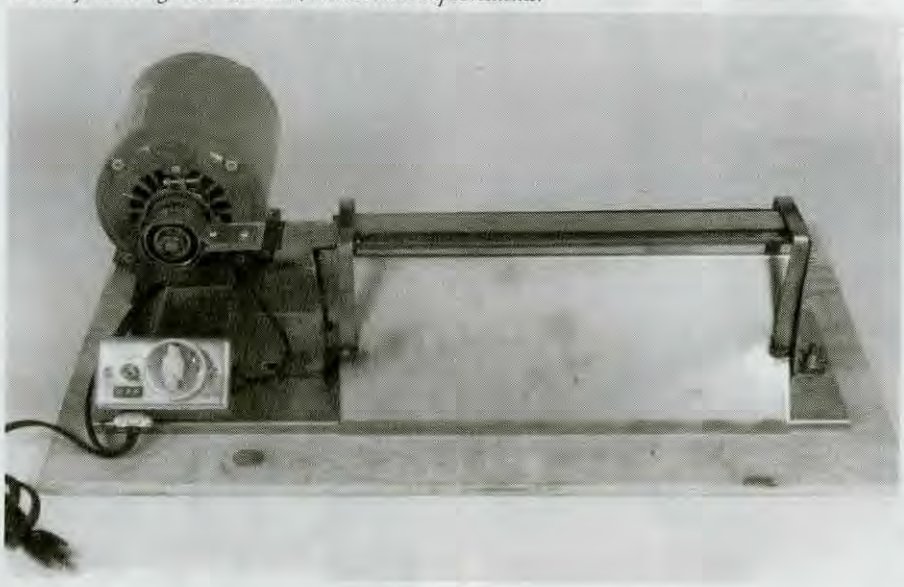
The hand-held uncapping plane is a novel uncapping device. Originally, uncapping planes were steam-heated, but now all are electric (either 110 or 220 volts). It's referred to as a "plane" because it shaves off cappings much like a woodworker's hand plane shaves wood. The blade, made of heat-conducting copper, is five inches wide and comes in either a left handed or right handed model. The depth of cappings cut is adjustable. The lightweight plane is pulled across the surface of the cappings. A shallow frame can very nearly be completely uncapped with one pass of the plane. As with other electric knives, don't submerge the plane in water. A nice feature on one of the antique steam hand planes in The Ohio State Beekeeping Museum is a knife edge on top of the plane that was also heated. This auxiliary blade was used to scrape burr comb and propolis from frames.

MOTORIZED SYSTEMS

Even the most routine task can become exhausting work if performed long enough. When uncapping, hands quickly blister and "Big Honey Crop Happiness" quickly fades to "Big Honey Crop Aching Dread." Thus, beekeepers continue developing better ways to put motors on uncapping knives. Some very good ideas have come along.

• Electric vibrating knife. The Walter T. Kelley Company, for many years, has manufactured an electric vibrating knife. This uncapping device can be used cold, but works much better if the vibrating blade is heated with either steam or electricity - depending on the model ordered. The knife is hardened and has edges on both sides. Cappings fall from either side of the blade into an accompanying uncapping tank. The electric heating element is regulated and can be replaced if it ever burns out. The electric knife vibrates by cam on a ¼ HP, 110 volt motor.

A Kelley vibrating knife sold now, with several improvements.

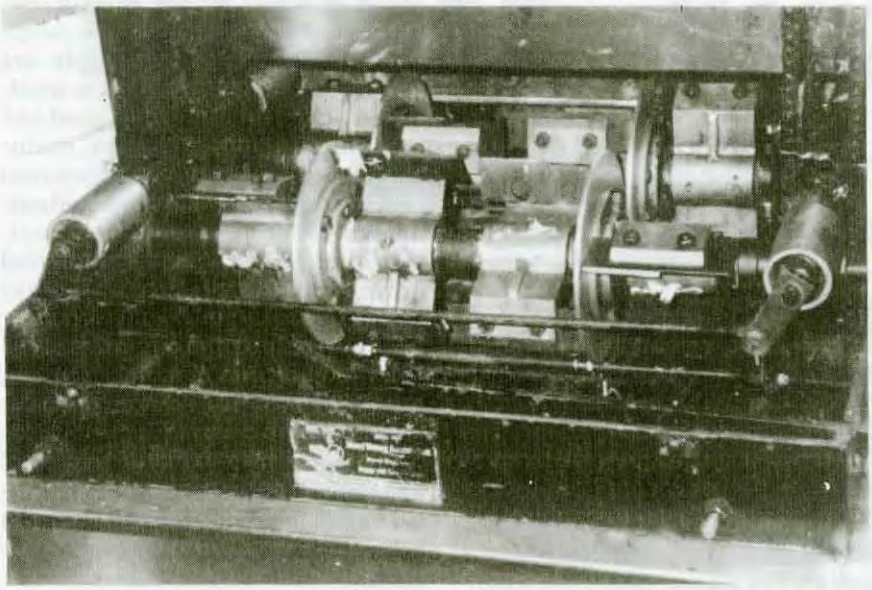


• The Cowen Uncappers. The series of Cowen Uncappers, the Mini Uncapper, the Silver Queen, and the Cowen Uncapper, are all manufactured by Cowen Manufacturing Company, Inc. Standard features on all models include: stainless steel knives and channels, nickel-plating on drive parts, an on/off reversing switch, slip clutch, a pair of serrated steam or water heated knives and an instant adjustment of cutting depth. These 1/2 HP machines will uncap from six to eleven frames per minute, depending on the model. Some units are single frame models while other larger units have chain driven tracks that will hold ten frames and advance them automatically to the paired uncapping knives that are vibrating and are heated.

• Maxant Motorized Chain Flail Uncappers. Maxant Industries, Inc. manufactures the Maxant Series of motorized chain uncappers. This system, requiring no heat and having no knives, works off a system of short, adjustable, revolving chains that nick the capping enough to tear them open. The system automatically stops as single frames are hand loaded and hand lowered through the flailing chains. This system requires ten seconds to uncap both sides of any sized frame. There are several different variations of this machine that can be used with different uncapping tanks or extractors. An automatic system is also available.

• Dakota Gunness Chain Flail Uncapper uncap combs that have been placed on a horizontal conveyer. While riding the conveyer, combs are fed through stainless steel chain flails that lightly tear the cappings open. Flails are located directly above and below the honey comb as it passes through the uncapper. The large model uncapper will handle up to 24 deep frames per minute, though it will take frames of all sizes. Some of the attributes of this stainless steel uncapper is that it does not require equipment changes to uncap different size frames nor does it readily jam. The uncapper has two motors which are equipped with variable drives making the speeds of both the conveyer and the flails controllable.

• Maxant-Mraz-Marvel Uncapper. The Maxant-Mraz-Marvel (Triple M - Series 1000) system uses 564 wire picks, each individually removable and replaceable, on a slowly



A Bogenshutz uncapper uses blades on a rotating shaft. It is very unforgiving of imperfect frames.

revolving drum (150 rpm). Consequently, combs are not torn or ripped. The machine is able to uncap 18 - 20 frames per minute. Frames are loaded individually. The frame feeding chain, uncapping drums, and tank conveyor chain have individual motors. Combs to be uncapped are passed between two revolving drums each have spring-wire picks that tear open honey comb cells. Cutting depth is adjustable and a reversing switch is provided.

• Cook & Beals Automatic Uncapper. The Cook & Beals Automatic Uncapper (Model 96) will handle any frame at the rate of 12 frames per minute. No mechanical changes are required when frame size is changed. Eighteen combs can be placed on self-feeding conveyor arms. Adjustable rotary cutter knives, powered by a ¾ HP motor, cut cappings off combs. Cappings are diverted away from combs so they do not accumulate on the frame top bars. Uncapped combs are then moved via a chain drive mechanism to a stainless steel storage tank having room for 50 frames. A slip clutch prevents breaking frames should there be an occasional jam.

• Brush Uncappers. Over the years several companies have introduced uncapping devices similar to chain uncappers, but with stiff brushes removing cappings instead of flailing chains. They have had mixed success, but a one-sided unit is available from Dadants. Little wax, but fast uncapping is the norm.

RELATED UNCAPPING EQUIPMENT

All uncappers must have some type of holding container for uncapped frames awaiting extraction. Only the very smallest operation could operate efficiently without such temporary storage units. The size and shape of these containers is directly related to the size of the uncapping machine. Maxant Industries, Inc. makes a "merry-go-round" for holding frames while the extractor is running. The circular table rotates around from the uncapper to the extractor saving the operator many steps. Cook & Beals, Inc. manufactures the Honey Comb Handler, a large-scale machine that takes short stacks of full supers, removes the frames, cleans the combs and then moves the prepared combs to a human operator for placement in an uncapper. The rate of comb delivery is controlled by the operator. Pieces of equipment such as these can make an uncapper even more efficient.

Variations of all of these systems exist by the manufacturers, by design, or by customized order. Honey house designs dictate space and use requirements, and most companies can build to suit exact requirements.

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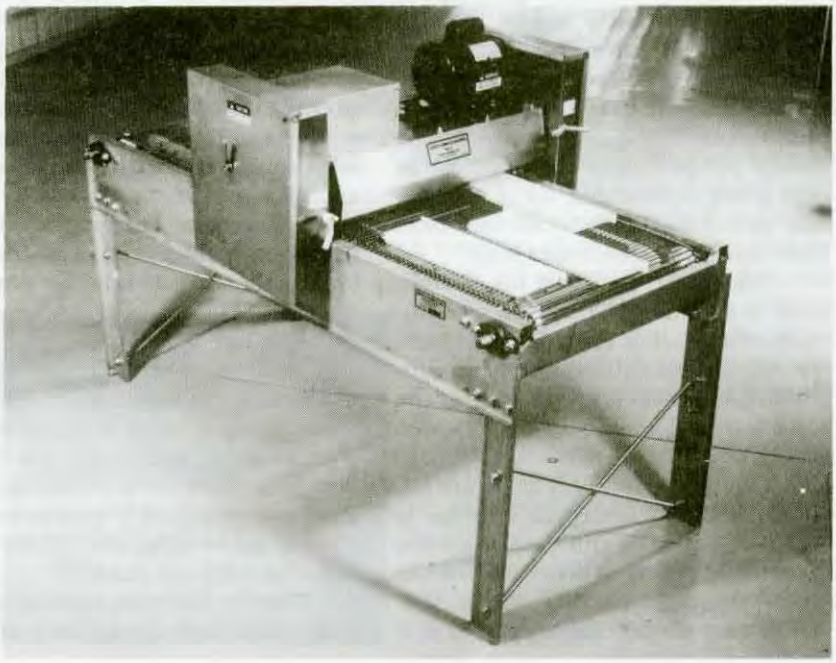
A Maxant chain uncapper. The frame is set in place and lowered between the swinging chains that flail off the cappings. An automatic model is available.

The Gunness Chain Uncapper. The frame moves horizontally between the flailing chains.



A Cowen unit uses knives to remove the cappings . Partially and fully automatic models are available.

TOPPING OFF ... Cont. From Pg. 405

THE PAST AND THE FUTURE

No style of uncapper has ever been completely eliminated. All have evolved and have been modernized into the list presented above. Even the hand-held knife is now being made from stainless steel. In past years, product research has been directed toward building a special type of frame and extractor with enough strength to withstand very high speed extracting. No uncapping machine has it all - high speed, ease of use, frame safety, and complete uncapping efficiency. But, all units are close. All units discussed are available. Each system has both good and bad features. In recent years, chain-flail uncappers have been developed as an alternative concept to vibrating knives. At the same time, vibrating knife machines have improved greatly. It seems apparent that uncappers are still evolving.

Where will we be in 20 years? Will we all have laser powered uncappers that burn small holes in honey cappings at blinding speeds? I don't know, but be assured that we will have even better machines in the future and also be assured beekeepers will still be trying to make honey processing easier. BC

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

DO YOUR OWN ... Cont. From Pg. 401

For instance, what about colony weight (a measure of honey production), or brood production (a measure of the queen and *Varroa* infestation), or incidence of other problems arising during the season (Diseases such as chalkbrood, queenlessness, colony death and the like *may* be measurable if they occur with regularity)?

There are fairly simple statistical tests that can tell if honey production and mites per bee are related. The question then is: Does honey production in a colony go down as the mites per bee ratio goes up? We're not going to examine these secondary questions, but you can see where this type of research can lead.

The Summary Chart is just that, only a summary. There are a multitude of statistical analyses that could be run on this data to fine-tune your findings. However, just looking at the chart will tell you if you've got something worth further investigation.

Often, the numbers alone are difficult to use or interpret. It helps to make a graph of the data from the summary chart, or from any of the data you've gathered.

There are several ways to look at the numbers you have worked so hard to gather, but we'll focus on only three.

We didn't include all of the numbers on our data collection, assembly or summary sheets, but we do have others for these graphs.

The first is a look at how a treatment fared over the course of the experiment. Look at treatment 2 from the summary chart, using a bar graph.

The graph shows the *Varroa* story over the life of the experiment for the colonies in that treatment. Remember though, these are averages, not actual numbers.

The second bar graph looks at each treatment at one point in time, (September 15). It tells an interesting story, but only part of it.

This last graph shows the average mite load for all treatments for the entire experiment. It tells the whole story of what went on during your experiment. , according to the data you collected. It does not prove Basil leaves control *Varroa* mites, nor does it prove otherwise. More tests and statistics are needed.

There is one more caution to consider. Your findings are only as good as the design of your experiment and the quality of the data you collect. The design is fairly straight foreward, but do not be tempted to influence the outcome of your experiment to favor your hypothesis, just so you look good. There's absolutely nothing wrong with being wrong, and proving it. Scientists do it all the time, though they seldom publish those results. You don't need to either.

However, when you have enough information, collected in a way that is useful, you can approach someone with your hypothesis, your data and your analysis. You may have enough to make some claims about your hypothesis, or there may be absolutely nothing to your idea.

The point is, you won't know unless you pursue the type of research laid out here. Without it, you don't have a leg to stand on. With it, you may have a beehive full of silver bullets. BC

Buzz Phillips is a sideline beekeeper, part time researcher and occasional contributor to Bee Culture *from Southwest OH.*

BEESWAX – Commercial Processing Equipment

Roger Morse

Beekeepers usually harvest two to four pounds of beeswax for every 100 pounds of honey they produce. In most years beeswax represent sales about five percent of a producer's income. Beeswax is composed of over 300 chemicals most of which contain only carbon, hydrogen and oxygen. One of its greatest features is that it is easily stored for long periods of time, even decades, and does not deteriorate. However, beeswax should be stored on dry cement or wooden floors. Beeswax stored on dirt floors may deteriorate since there are many soil microbes that may attack and digest the wax. Many beekeepers have held their beeswax for two or three years waiting for better prices without any deterioration.

Source

Beeswax is secreted as a colorless, odorless liquid from four pair of glands on the undersides of the abdomens of young worker honey bees. It solidifies and turns white when it comes into contact with air. Beeswax is yellow because it contains minute amounts of propolis and pollen. In fact, to obtain a nice yellow color to make candles, some beekeepers add a little yellow or reddish colored pollen. A small amount of added pollen can do wonders for beeswax color and the resulting odor of a burning candle.

Wax scales are produced from glands on the underside of a worker's abdomen.

Beekeepers harvest beeswax from two sources. One is cappings wax, which is obtained when combs of honey are uncapped for extracting. The second source is old comb and hive scrapings. However, the wax obtained from scraping and cleaning up equipment usually contains too much propolis to make good wax. Beeswax that contains too much propolis has a greasy feeling and may be mushy.

Processing Cappings

There is no good or perfect way to separate out the honey and recover the wax from cappings. Many beekeepers use Brand melters that melt the beeswax cappings in the presence of honey. Brand melters produce high-quality beeswax. Their chief advantage is that at the end of the day, the job of separating the wax and the honey is done. However, the honey that passes through a Brand melter is darkened (burned) by about 10 percent because of the high temperature, since most Brand melters are heated with steam. The honey collected is essentially unuseable and should be discarded. In a big operation this amounts to considerable amounts and the use of this type of melter may not be practical. However, the time saved and the equipment not needed for further processing may far outweigh the loss of honey, even at current prices. Check with suppliers or users to determine both cost savings and efficiency us. honey loss before purchasing.

A simple uncapping tub uses the same principles as any larger unit.

Spin drys that make use of centrifugal force to separate the wax and the honey are becoming increasingly popular and produce a good product. The wax from a spin dry is reasonably free of honey, but the collected honey contains a small amount of air that must be removed. However, these machines are expensive, large and not practical unless you have several hundred colonies at a minimum to extract from.

Most beekeepers allow their cappings to fall into a wooden or metal tank with a screened bottom that allows the honey to drain into a separate container. The honey perfectly good with this method. The honey remains perfectly good with this method. The cappings are reasonably free of honey after about 24 hours, especially if they are kept or placed in a warm room. I like to have the bees rob the honey from cappings, a practice that is frowned upon by many of my disease-conscious friends. It is correct that robbing cappings is one way of spreading American foulbrood, but it also produces a quality product that is easily rendered. Some beekeepers simply put wet cappings in a hive-top feeder and let the bees clean them up. A small number of beekeepers use extractor-type spin drys into which the cappings may fall as the combs are uncapped. This type of spin dry revolves at a slow speed so as to dis-

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Two types of wax presses.

BEESWAX - COMMERCIAL ... Cont. From Pg. 407

tribute the cappings around the drum as the uncapping is being done. At the end of the day, the extractor is speeded up and the cappings dried. Removing the cappings from the cappings extractor is not easy, but the advantage is that they are reasonably dry.

Many years ago, some beekeepers placed their cappings in a press and pressed the honey from the cappings. This is a slow, tedious job. Sometimes a bubble of honey will be trapped in a cake of cappings. Cakes of pressed wax must not be stored for long periods of time as the honey on their surfaces may ferment and give the wax an off flavor and odor.

Rendering beeswax

Two facts are paramount in the preparation of beeswax for market. One is that beeswax has a flash point, that is, a temperature at which it will burn explosively. You should always melt beeswax in a solar wax extractor or in a tank heated with hot water or steam, never with a direct flame. Beeswax melts at about 148°F.; it has a flash point of 490 to 525°F. (254 to 274°C.).

A second fact is that raw iron will turn beeswax brown or black; Monel metal will make it greenish in the presence of water. Only stainless steel tanks should be used to render (melt and clarify) beeswax. Wooden tanks are also satisfactory, but I hesitate to advise their use since it is difficult to keep them watertight if they are not in continual use. A wax press (described below) is the only practical way beekeepers have of rendering beeswax without having a residue that must be sent off for commercial rendering.

Solar wax extractors

Using solar wax extractors heated with sunlight is fun, but they only border on being practical. The best solar wax extractor will render only a few pounds of wax a day and is thus costly timewise. However, solar wax extractor wax is usually of high quality. A proper solar wax extractor is a box of any size with a sloping stainless steel pan so the wax will run down the pan and into a tray where the cake of wax forms. The inside of the box is painted white so as to reflect the light around the box while the outside is painted black so as to make the inside warmer. The cover of the box should be made with two pieces of glass about a quarter of an inch apart; however, some beekeepers use only a single sheet of glass or plastic with good results. On a day when the outside temperature was 91°F(33°C) we recorded a temperature of 212°F(100°C) inside our double-glass, covered solar wax extractor at Cornell. However, in tests we performed, our wax extractor recovered only about half of the wax in old comb where much of it remained entrapped in the cocoons. A solar wax extractor does not do a perfect job of removing all of the wax from cappings either, and in both cases, the material from which the wax is rendered should be saved and sent to a commercial plant or be rendered under pressure. The honey recovered from a solar wax extractor is usually burned and must be discarded. (For a detailed study of solar wax extractors see Dick Bonney's article in the June, 1996 issue of this magazine.)

Wax presses

The most practical method of recovering beeswax from cappings or old comb is to use a steam-heated, underwater, screw or hydraulic press. The wax to be rendered should be heated so it is molten and placed in thin, two- to four-inch-thick wafers or cheeses wrapped in burlap. One may load a press with room temperature wax but it takes far more space than that which is compacted. Wooden or stainless steel separators are placed between each cheese. The pressure should be released for a few minutes every hour. Pressing a load of cheeses for 10 hours will remove all but one to two and half percent of the wax. Pressure alone is not practical – recovering the beeswax from a press takes time. Extra pressure will not substitute for time.

Steam chests

A steam chest is an insulated stainless steel or enameled box into which steam is injected. It may be used to partially liquefy cappings before placing them in cheeses and a

pressure press. It is sometimes possible to dip off liquid wax from the molten mass at the bottom of such a chest. Steam chests are especially useful to melt up old broken and discarded combs. I have seen steam chests made from used refrigerator boxes equipped with rabbets resembling those in supers. A large refrigerator box may hold as many as 50 old combs or frames side by side as they are in a super. When these are heated, the combs may fall out of the wooden frames by themselves, or a gentle knock on the side of the chest will cause the comb to fall free and the old wooden frame may be discarded.

Emulsions

Beeswax may dissolve in water and form a cake that is granular. This is especially common when there is honey in the wax. As I mentioned above, I like to expose old comb and cappings and allow them to be robbed dry by bees before they are rendered to get rid of the honey. However, this is a good way of spreading diseases, especially American foulbrood and as I discussed above, should not be done if you have infected equipment.

Less common is the water-in-wax type emulsion. When beeswax contains water, it is mushy, especially on the inside of the cooled cake. Both emulsions may be broken by remelting the wax in a large quantity of water. Water-in-wax emulsions may cause foaming when the wax is heated rapidly, or with a direct flame, when the water turns to steam.

Preparation for market

There is no prescribed size or weight for a cake of beeswax that is being prepared for market. Most beekeepers pour their wax into plastic or stainless steel molds that will make cakes weighing 20 to 30 pounds each. It is expected that such cakes will be reasonably clean, which means straining the wax through cloth or screening. Refined wax, and wax used for making foundation, is filtered under pressure but that process requires a special heated press and centrifugal pump, many large filters and room.

Beekeepers who make their own candles will find that passing the wax through several layers of cloth will usually be adequate to make a clean wax. Nylon is the favorite. Beeswax may be held in a liquid state for an hour or more during which time dirt and debris will usually settle to the bottom. If this is done over water much of this extraneous matter will settle into the water. You may chip this unclean wax off of a solid block and remelt the clean product prior to making the candles.

The end result: Large cakes of clean, and profitable beeswax.

Bleaching and preparation of special waxes

There is a demand for beeswax for special markets such as the dental, cosmetic and other trades. However, the beeswax prepared for these markets is treated according to specifications from the companies that purchase the wax. At one time, sulfuric and oxalic acids were used to brighten and lighten the color of beeswax, but these are dangerous to use; the circumstances under which they are used requires special equipment and is better left to the refiners who will do the final marketing. One special problem is that wax treated with acid should be held in wooden tanks since acids, especially oxalic acid, will corrode metal, including stainless steel. The use of acid to treat beeswax by processors has given way to the use of activated or diatamatious earth, charcoal and filtration under pressure in a press.

For many years, it was popular to bleach beeswax with sunlight. The wax was either shaved and flaked and exposed in this form to the sun or it was placed in liquid form in shallow pans and exposed to the light. Several weeks of exposure may be required to bleach beeswax, though this varies a great deal based largely on the source of the wax. Some waxes, depending on where they are produced, contain more or less bleachable components depending upon the propolis and pollen they contain.

Processing large quantities of wax requires a certain expenditure in equipment and the space to use it. Generally, the more efficient the process the greater the profit gained from the finished product. "Wasting" honey from cappings may be more cost effective when using a brand melter system than trying to save the honey. Presses, steam chests and the like are impractical for most of us. Reclaiming this wax is best left to professionals with the right equipment.

Melting old combs should be handled in the same manner as cappings (but not at the same time) to reclaim the wax. Recovering the majority of the wax is acceptable considering the cost. Don't spend $10.00 on reclamation for $2.00 worth of finished product.

Beeswax is a practical, valuable commodity, and a sure-fire means to increase your income. Don't waste beeswax, but don't waste energy recovering it. As in all things, moderation and balance are the rules. BC

BEESWAX – Recovering Small Harvests

Richard Bonney

As beekeepers, we always seem to have some amount of used beeswax around, but more often than not, it is in a form that no one else wants – raw cappings, scrapings or discarded comb. It can be a nuisance, and some actually throw it away rather than cope with it. This is unfortunate, because this wax has value, and it can be recovered without great cost or aggravation.

Last month, we looked at one of the methods that can be used for the initial handling of such wax, the solar melter. Of course, not everyone has or wants a solar melter. They do tend to be large, awkward, sometimes breakable, and often a nuisance to have around. Other possibilities for rendering wax do exist. One of these is a simple boiler using a tub, pail or other container that can hold water and be heated. I have used a variety of such containers in sizes ranging from two quarts to 55 gallons. A size somewhere in between those two is probably best for most of us though.

An easy way to melt cappings is over an open fire outside. This special bucket has an opening to allow melted wax to run off. Ladeling or pouring work well, too. Just be careful when using an open flame and wax.

I will describe a method for rendering a quantity of cappings or scrapings in one of these boilers. If you like the basic idea, you can modify it to suit your own situation and available equipment.

First, the container. Keep in mind that certain metals such as brass, copper and iron can cause discoloration in wax when in direct and prolonged contact. Galvanized and stainless steel, tin and enamelware are generally safe. Assume you have access to a two- or three- gallon metal pail that can be placed on a hot plate or on an open fire outside. An enameled pot such as is used in preserving food works well. Just don't try to make one such pot do double duty. Once used for wax, it is difficult to bring it back to the pristine, waxless condition necessary for preparing food.

Work outdoors if at all possible. If you must work indoors, expect some splashing. Have a fire extinguisher handy. Place the pot over a heat source, filled about one-fourth with water, and bring the water to a boil. Progressively and slowly add the wax to be rendered, whether it be cappings, scrapings or old comb, bringing the level in the container up to about three-fourths full. Watch your pot continually. Do not allow it to boil over.

Safety note: Beeswax is flammable. Ideally, it should not be melted over direct heat, but in a double boiler. However, boiling wax in water as described here is not practical in a double boiler, especially if large volumes are involved. In this instance, use direct heat and take care. Never leave the boiling wax untended. Even when mixed with water as described, it has the potential to catch fire.

Once all the wax has melted in the water and the mixture is boiling steadily, allow it to continue boiling gently for five to 10 minutes. Then turn off the heat and allow everything to cool. Once it has cooled, you will find that the contents of the pot have settled into three layers. On top will be the solidified, relatively pure wax. On the bottom will be the water, now somewhat murky with honey and impurities dissolved from the wax. In between these two will be a layer of solid or semi-solid impurities, the exact makeup depending on the nature and purity of the original wax being rendered. Cappings will yield few such impurities; old brood comb will yield a large amount. This layer of impurities will adhere to the wax and must be scraped off. (Throw the scrapings in the compost. There is a lot of good stuff in there.) Once scraping is done, the block of wax remaining is very similar to the block resulting from a solar melter.

What next? That depends on the ultimate use to be made of the wax. If you are going to sell your wax to a processor or trade it for comb foundation, then you are done; it needs no further processing. At the other end of the scale, if it is to be used for candles or in competition at a honey show, it does need further processing. The initial processing as described above seldom purifies the wax completely. Varying amounts of honey will remain, especially in the wax that comes from a solar melter, and very fine debris is likely to be suspended in the wax. This debris usually manifests itself as black specks on the surface of your prize candles or show entry.

To obtain the very fine quality of yellow wax desired for candles and shows, or for herbal salves and other cosmetic uses, boiling again is in order. This time, the process is modified slightly. First, use a container from which the molten wax can be poured after the boiling is complete. A camp-style coffee pot with the spout high on the side works well. With such a pot you are able to pour or decant from the top with minimal disturbance to the layers of sediment and water below. Again, fill the container one-fourth with water, heat, and add the wax. This time the wax will be the solid chunks resulting from the earlier rendering or from the solar melter. These, of course, must be broken into pieces that will fit into the pot. Bring to a gentle boil and hold that boil for 15-20 minutes after all the wax has melted. Then, remove the pot from the heat and allow it to sit for about 10 minutes while the contents settle themselves into the three layers as before. This time, however, you don't want the wax to solidify.

After the settling time, gently decant (pour off) the wax through a filter cloth into previously prepared molds or containers. My own system is to pour the wax through the filter into one- or two-quart waxed paper milk containers. From these, I can then pour the still molten wax into candle or other molds, or allow the wax to solidify for later use or sale. By introducing the intermediate step, the filter is not in the way during the candle-making process.

For best results when filtering, use a fine mesh material. Cheesecloth is much too coarse. Some people use old T-shirt material, sweatshirt material or similar fabrics. Others use coffee filters or paper toweling. Try different materials and see what works best for you. I prefer very fine mesh nylon, and have also used rayon curtain material successfully. Use something, though. Those little black specks are insidious.

It is not possible to decant every bit of the melted wax without also taking some of the sediment that has settled under it, and even the finest filter may pass some of it. To avoid this sediment, I leave a thin layer of wax behind in the melting pot. After it hardens, it can be lifted out, scraped of the accumulated sediment and added to the next batch of wax being boiled.

Once you have perfected your system and you begin to accumulate quantities of beautiful yellow wax, what should you do with it? The same thing you do with your surplus honey – sell it, give it as gifts, or use it yourself. Make the wax into beautiful molded or dipped candles, or even just into carefully formed blocks. Then, if you sell honey, put some candles and a few small blocks of wax on display, too. And, of course, make some into prize-winning show entries.

Basic molds for making blocks are available from equipment suppliers in several sizes from one to 16 ounces. Fancier molds are also available for making different kinds of decorative objects. Look in the catalogs under candle-making supplies. To enhance your sales display, make up appropriate small signs to promote your product. For candles, for instance, point out the superior qualities of beeswax – longer and cleaner burning, drip-free, and sweet-smelling, for a start. For the wax blocks, point out that the one-ounce size is handy to keep in a sewing basket or tool box. Use it to lubricate needles when sewing heavy material, to waterproof thread, to lubricate nails and screws before driving, and to ease sticking drawers, doors and windows. No doubt you can think of other uses. The larger size, say one pound, is sought by many artists and craftspeople who often must pay exorbitant prices for beeswax in artist supply and craft outlets. If you offer a quality product at a reasonable price, you will quickly find you are selling all you can produce. If this happens, let your fellow beekeepers know that you are interested in buying their surplus wax.

Continued on Next Page

Separate, But Equal

When handling old wax – cappings, scrapings and old comb – there is often the temptation to throw it all together without regard to color. Be aware that although boiling wax as described removes the bulk of the impurities, it does not lighten the color. Keep the colors separate at all stages.

It is possible to lighten the color of wax, though, within limits. An article entitled "Better Beeswax" in the July 1995 issue of *Bee Culture* describes how to do this using hydrogen peroxide. The method works. However, keep in mind that although you can lighten the color, the lightened wax is not going to be the "lemon yellow" color that we prize for candles and show entries. In my experience, the resulting wax has a slightly grayish cast, acceptable, but not a guaranteed prize winner.

Even well filtered wax will have some impurities on the bottom. Use very fine filter cloth, and when remelting, leave the bottom sediment in the pan.

The finished product – molded candles and other wax items, to sell or use.

BEESWAX – RECOVERING SMALL AMOUNTS ... Cont. From Pg. 411

There will always be some who see wax as a nuisance and will be pleased to sell it to you in minimally processed form for a modest price. After you perfect your processing operation you might even consider buying unprocessed wax – the raw cappings and scrapings.

What do you do with your dark-colored wax, the stuff that results from old brood comb? Some of it is really dark and loaded with propolis. There is little hope for bleaching it in a small home operation, and even if you like the idea of naturally brown candles, such candles will not burn evenly nor will they be drip-free because of the propolis. Trade that wax for comb foundation.

Check your equipment catalogs. You will discover that some of these distributors will accept your rendered wax (but not raw cappings, scrapings or comb) in exchange for foundation, and some will buy the wax outright if you don't need foundation. The manufacturers of comb foundation do not care about the color. They have the facilities for pressure filtering the wax, so they will accept even your darkest wax. Of course, they will accept your lighter wax, too, and even pay more for it since it requires less processing before being made into foundation or candles.

Even if your favorite dealer or distributor does not advertise to buy or exchange wax, ask. Maybe it is an unadvertised service. Another possibility is to ask among your fellow beekeepers. Some of them may have built up a clientele for their surplus wax and would welcome the opportunity to buy from you for resale. BC

Richard Bonney is an Extension Educator for the state of Massachusetts. He is a regular contributor to these pages.

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A Lightweight Bee Blower

Roy Hendrickson

There's lots of uses for this bee blower, and it even moves leaves.

Needed: A lightweight, portable bee blower for miscellaneous use around the apiary. Currently available blowers, while very effective, are also heavy, cumbersome creatures, too heavy to lug around all day for occasional use.

Formerly a stock item in some beekeeping supply catalogs, lightweight blowers seem to have gone the way of the buggy whip. The local lawn- and garden supply stores seemed the logical starting point to search for a leaf blower adaptable to apiary use. Several possibilities in a variety of price ranges were available. Backpack models were eliminated, again too cumbersome and far too pricey. That left the handheld blowers as the only option. Of the seven or eight different brands I looked at, the Echo PB2400 appeared to be the most practical. Like most of the handheld blowers, it had an air speed of around 150 mph, and an average air volume of 350-375 cubic feet per minute. Weight is also similar at about 9-10 lbs. What set the Echo apart was the throttle lock mechanism. This allows the engine speed to be held constant, thereby freeing up both hands for other work. Quality construction, easy adaptability to a flex hose, and a very affordable $200 price made it the only choice.

The flex hose, nozzle and couplings are available through a couple of beekeeping suppliers, or they can be purchased locally from appliance or vacuum cleaner repair shops. The adaptation of the blower outlet air tube to accommodate the flex hose coupler requires only a hacksaw and some electrical tape. Cut the outlet tube to the proper length, wrap the electrical tape around the coupler (to act as a filler or bushing) and slide the coupler into the cut-off air outlet tube. No additional clamps or fasteners are required.

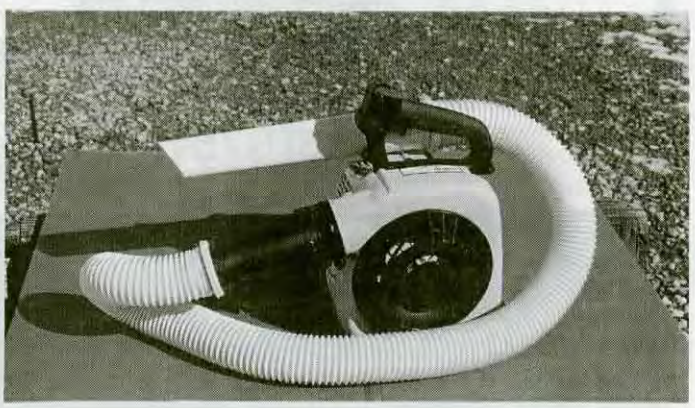
Upon completion, you have a very adequate, lightweight blower suitable for most apiary needs. With the purchase of a second air outlet tube to replace the one cut, you again have a leaf blower. BC

Roy Hendrickson moves bees all over northeast Ohio for honey crops and pollination.

Blower with hose and nozzle. Note throttle lock.

Cut off air outlet tube with taped hose coupling.

The complete unit, assembled



MAKE A POLARISCOPE

This Stargazer will show you things you won't believe.

Vincent Doyle

"Life is like a box of chocolates... you never know what you're gonna get." This unforgettable line from Forrest Gump applies equally well to a jar of honey.

Crystals form, honey granulates. When this happens, liquid honey changes into something quite different and sometimes unpalatable, and all because honey comprises two crystalline sugars: levulose and dextrose.

Usually too small to be easily seen, these crystals have the power to change the future course of events as far as your crop is concerned. Even if the honey is heated and the crystals melted, a batch can become recontaminated either by crystals floating in the air or by storage tanks and pipes that have been improperly cleansed.

Crystals too small to be seen by the unaided eye can induce granulation. Yeasts floating around your shop can cause the honey to ferment as they feed upon these granulated sugars. You end up with vinegar, if you're unlucky . . . or Metheglin, Mead or creamed honey . . . if you know what you're doing.

How do you know? To avoid surprises and see what the future holds in store make and use . . . a polariscope. This simple device can detect the presence of less than 0.004 percent of fine-grained crystallized honey mixed with liquid honey. In fact, with the right equipment a single crystal is large enough to be visible.

That fact alone makes this a 'must project' for honey judges, since freedom from crystals and cleanliness are the most important criteria when it comes to the exhibition of extracted liquid honey. A single crystal makes the difference between first and second prize when all else is equal.

Not surprisingly, the polariscope works with light. The study of light and its properties was one of Einstein's preoccupations. Mere mortals, however, can understand the effect of polarized light without a lot of scientific mumbo jumbo. At least the effects can be demonstrated and understood once the polariscope is built . . . that is one of the attractions of the project.

You can even demonstrate how bees determine directions using the polarizing discs of the polariscope

with a space between them for the honey sample. The only movable part is the last polarizing disc which is mounted so that it can be rotated. That's it! Simple? You bet.

To use the polariscope you plug it into an electrical outlet, put the honey sample between the two discs, and then rotate the disc closest to you until the light grows dim. Light shining through the honey gradually darkens as the front disc is rotated. Then something strange and wonderful happens . . . bright stars appear, seemingly out of nowhere. These stars are the crystals which you hoped wouldn't be there.

The polarizing discs give the light a twist. Well actually, the first one straightens out the light and the second one gives it a twist. When you twist the disc far enough, you twist the light off and the honey sample goes dark. It's like looking through two picket fences. Then someone turns one fence on its side. Suddenly you can't see what you were looking at. That'll teach you to go looking through peoples' fences!

You recall the Latin-sounding names given to the sugars found in honey . . . levulose and dextrose? Remember those names because crystals can twist light just as the polarizing discs do. Levulose is levorotatory, "left twisting"; Dextrose is dextrorotatory, "right twisting." You're ahead of me?

Okay, so you see what happens . . . we twist the light so we can't see it . . . no light, everything goes dark . . . put the honey sample in between and the sugar crystals twist the light back where it was, but only in those places occupied by crystal. Where the crystals are, light passes. We see them as bright specks.

Note that even though the crystal itself may be too small to be seen with the unaided eye, the flash of light betrays its presence as plainly as a star shining forth through the clear air of a moonless arctic night. We

don't see the star, only the light from the star.

It figures that if there are lots of stars, there is a good chance that this honey will soon granulate, and if there are only a few, then it will probably granulate slowly if at all. By the way, if you want it to granulate quickly, store your honey at a temperature range of 50° to 60°F. or 10° to 15°C. Honey granulates quickest at 57°F. or 14°C. So keep it really warm or really cold to prevent granulation.

To test out your "star gazer," examine a sample that you are sure doesn't have any crystals. Judging from my own experience, you will be surprised at what shows up. But then that's the whole point, isn't it? What you see is what you get when you use the polariscope to go star gazing! BC

Vincent Doyle keeps bees, and checks honey at his home in Cowichan, B.C. Canada. He is an occasional contributor to these pages on a variety of subjects.

List of Materials

Pine board S4S, 1 x 8, 6 ft. length – ea. 1

Masonite (or similar) 3/16" x 7-1/4", 3 ft. length – ea, 1

Hardware:

Wood screws are all size #8 in the following lengths:

1-1/2" – ea. 12

3/4" – ea. 26

Hinges, 1/2" x 2" brass – ea. 2

Feet, appliance – ea. 4

Bathroom-fan vent – ea. 1

Drawer pull – ea. 1

Optional Items:

Brackets, right-angle, 1/2" x 2" – ea. 2

Bolts, carriage (complete with flat-washer and nut) – ea. 2

Electrical:

Appliance cord, 2 cond. c/w plug – ea. 1

Lamp base, screw socket, plastic twist-mount – ea. 1

Floodlamp, 100W 120 VAC – ea. 1

Optical:

Polarizing discs, set of 2

Available in Canada at Northwest Scientific Supply Ltd., 7298 Hume Avenue, Delta, B.C. as catalogue #24-5967 for $29.65 plus tax.

Construction

Refer to the photo and bear in mind that there are many ways to build things, even hamburgers . . . .

1. Mark and cut the 1 x 8 to obtain seven pieces identified as: A=20"; B=7-1/4"; C=7-1/4"; D=7-1/4"; E=9"; F=9"; G=11"
2. Mark and cut the Masonite to obtain four pieces identified as: C1, C2, and D1, D2 each 7-1/4" square.
3. Prepare the base A as follows: Draw lines across the narrow dimension at 3", 5", and 7" from one end. Draw another set of lines along the length at 1-3/4", 2-3/4" 3-3/4", 4-3/4", and 5-3/4" from one side. Drill 1/2" ventilation holes through base A at 15 locations where these lines across. Draw lines across base A at 1-1/2" and 7" from the other end and from each side at 1-1/2" and 1-7/8". Remove the wood to form two slots 3/8" by 5" to provide adjustment of polarizing cell #1. Mark four locations 1" in from each corner and mount the feet.
4. Find the center of end B by drawing diagonals from corner to corner and drill through using a 1/4" bit. Place the lamp base over end B, center it by eye and mark the screw locations. Insert the screws partway. Try the fit by mounting the socket over the screws, making sure the socket can be twisted on or off and adjust the screws for best fit. Remove the lamp base; it will be wired in later. Mark the location of the two hinges equidistant from the ends of B. Cut recesses to permit flush mounting. Mount the hinges. Mount end B on top of and flush with one end of A (by the vent holes) with two long screws.
5. Mount sides E and F on top of and flush with sides of base A and end B using three long screws – two through base A and one through end B at the top.
6. Mark across top G at 1" from the end and placing the bathroom-fan vent on this line mark the screw holes and the area to be removed for ventilation. Cut top G and attach the vent plate. Mark across top G at 2" from the other end and attach the drawer pull centering it along this line. Set G aside.
7. Prepare the optical cells as follows: Find the center points of cell #1 parts C and C1 by drawing diagonals from the corners. Measure the outside diameter of the polarizing discs. Scribe a circle of this diameter centered on C. Cut the hole. Test for a smooth fit. Set C aside. Reduce the diameter found above by 1/4" and scribe a circle of this diameter centered on C1. Cut the hole. Using part C as a template, mark and cut parts C2, D1, and D2. Determine the width of the polarizing discs and plane down one side of parts C and D to match this dimension plus 1/16".
8. Assemble the optical cells as follows: Cell #2 – using one polarizing disc and parts D, D1, and D2 make a "sandwich" so that the disc is mounted tightly in D and held in position by D1 and D2. Use screws at each corner. Build cell #1 the same way, except the fit must be loose enough for the disc to turn easily within part C. Sand the part carefully to obtain the best fit.
9. Mount cell #2 to base A with two screws through the base and to sides E and F with two large screws drilled through the cell at a point on either side 3-3/4" up from the base.
10. Drill out an oversize hole in each angle bracket to clear the 1/4" bolts and mount the angle brackets in the slots provided.
11. Position cell #1 on base A and mark the position of the mounting screws. Mount cell #1 to the brackets and tighten the nuts to hold the cell in place.
12. Pass the appliance cord through end B. Tie an underwriters knot to prevent the wire from putting a strain on the connection, strip the wire and connect to the lamp-base. Mount the base and screw in the floodlamp.
13. Mount the top G to the hinges and fasten to cell #2 with one screw through G at the front center.

This completes the assembly of the "Star Gazer." If your work has been first class you might like to stain the unit to show off your work. Mine will be painted.

A few questions come to mind . . . not answers, just questions: Can this polarizer tell you if the majority of the crystals in your honey are from dextrose or levulose? Honeydews are said to be largely dextrorotatory while normal honey is largely levorotatory.

The Dyce process of making creamed honey asks for 10% of "seen crystals" . . . could this unit tell you whether or not you have the correct percentage? Have fun!

Finally, the photo shows the fundamental design of all polariscopes: A light source directed through a fixed, and a moveable polarized lens, with space between the lens to place a jar of honey. Variations on this design are nearly infiniate, as long as the principles are followed. Size of light, ventilation, size. Material and hardware are all changeable.

FAIR TIME

Running A Successful Beekeeping Booth

Howard Scott

For many bee clubs, the Bee Booth at the annual county fair is the most important event of the year. It allows the members to sell honey, offers a chance to compete with others for the best honey, wax, candles, and other products, and it provides the opportunity to teach the uninformed public about honey bees, beekeepers and beekeeping.

The question is, what can bee clubs do to make their fairs memorable, equitable and profitable? We spoke to several fair leaders, and have come up with the following guides.

• Organize the fair activities through a committee. A committee of three to five people works much better than appointing one person to be in charge. If one person runs the show year after year, he or she will be more apt to repeat last year's formula. A committee is more likely to produce fresh ideas. Through a committee, each member can do his assignment, and the committee chairman can coordinate the efforts. Also, if possible, the committee chairman should not be the president of the club, who has enough to do without this task, too. Unfortunately, in too many clubs, the club president also runs the fair. One way to break that cycle is to appoint newcomers to the committee and encourage the buddy system, so that a seasoned pro works with a newcomer on projects. In this way, new blood will be pumped into the fair every year.

• Divide up the booth into manageable bits–observation hives, product sales, candle-making demos, bee demos, wall displays, cash management, volunteer recruitment, competitions, etc. The more people who get involved in the setup, the better. You should start on these projects months in advance, monitor the committee's progress with update reports at meetings.

It helps to know people's talents, which ca be determined by your members' occupations. If someone is a salesman, he can be put in charge of the product sales. The artist can create posters. The teacher would be a good bet to oversee the observation hives. The accountant is a natural choice to set up books for tracking and controlling sales. When a sign painter joined the Plymouth County Beekeepers last year, the club asked him to make a sign for the fair. The result is a distinctive sign above the building, featuring a hand-carved wooden bee.

• Make the endeavor strictly volunteer. When any pay is involved, there are squabbles. According to Bill Wiley, of the Essex County Beekeepers, who has been involved with the Topsfield Fair for 42 years, "Pay really creates problems. Members worry that someone is getting a better deal or is making 10 cents more an hour. A volunteer effort puts everyone in the same category, and there's a cooperative selling effort." Divide the fair into shifts and assign the volunteers appropriately. Members who sell their products will work shifts according to their contribution, but beyond that, solicit volunteers on the basis that the club's welfare depends on everyone helping out. Some clubs expect all their members to volunteer. They recruit them by phone.

• Change the display every year. Eighty percent of fair visitors are repeaters, so it's very important to vary your display to keep them coming back. You don't want to hear, "Oh, I've already seen this," and watch potential customers walk away. So be creative, be evolving, be innovative.

One way to assure varied exhibits is to have a different theme each year, and to weave that theme through the exhibit. For example, last year's theme for the Plymouth County Beekeepers was 'The circle of life." One member created a series of posters showing how bees have their own life circle, and that circle is integral to the circle of life of plants and animals. Another year, the club used the theme "A bee or not a bee." Its display contained several different insect nests, including wasp, hornet and

An observation hive and informational posters and decorations draw attention and potential customers . . . and beekeepers.

bumble bee, along with a wild hive and a hive frame.

What other themes are possible? How about: the history of beekeeping, inventions in beekeeping, bees as a society, products from the hive, bees in literature, beekeeping advancements, beekeepers in foreign lands, bees vs. humans – similarities and differences, bee diseases and their cures, the different jobs of bees? Think creatively, and you will come up with all sorts of ideas.

If possible, try to integrate the theme into your entire exhibit. One way this might be accomplished is by using signs stating the theme all around the exhibit. Another possibility is to have theme handouts at different spots in the exhibit. A third way to convey your message would be to have T-shirts printed with the theme written across the front. You may be able to sell extra T-shirts to recoup your costs. And of course, yellow is the perfect background color.

Stanley Sample, former president of Essex County Beekeepers, says his club tries to integrate the fair's theme into their exhibit. Last year, the Topsfield Fair's theme was "Celebrate Country." The club featured a competition of "celebrate country" place settings. Entries included country place settings with an open window in the background that looked out to hayfields and barns.

The Essex County Beekeepers also create changes by moving things around. Sample says, "Even if we have the same items on exhibit, we make sure things are different each year. Either the booths are switched around, or the items are arranged in a different way, or new signs are added, or we route the people differently. It feels like a new display every year.

The committee must brainstorm to come up with ways to change the offering. Maybe adding a new feature will do it. Perhaps building a different exhibit booth will work. Possibly changing the order of exhibits will suffice. Painting exhibits can't hurt either. Combining other crafts with beekeeping might be useful, also. For example, borrowing on the expertise of flower people at the fair, the Barnstable County Beekeepers have created as a new attraction, a bee perennial flower garden. A few years ago, their new addition was a children's corner. On a child's table, surrounded by chairs, they placed pop-up books about bees. That turned out to be such a favorite that if it's been included ever since. Recently, the Essex County Beekeepers have created honey mead and beer competitions. "Don't be afraid to try new ideas," says Barnstable club secretary Claire Desilets. Think creatively.

Static displays, protected from prying fingers can be informational and good promotion.

- Offer active displays. People really like to participate, so keep that in mind when you create your displays. Give people something to hold on to, or something to do, or something to play with, and they'll become more curious. When visitors look at observation hives, encourage them to find the queen or place a drone in their palm. Set up a candle-making booth and allow visitors to roll or dip candles. Hand visitors a hive tool and let them feel it. Let a visitor pump an empty smoker.

Continued on Next Page

If possible, selling "local" honey is an asset not only for the income, but the chance to interact with customers.

A live bee display, inside a protective tent of course, always draws attention.

FAIR TIME ... Cont. From Pg. 419

Stanley Sample, of Essex County Beekeepers, reports that his club's candle-rolling exhibit is one of its most popular events. Sample says, "During peak times, we'll have four rows of 18 people waiting to do it. People love doing something like this." Recently, they've increased the exhibit to include candle and ornament dipping. The Plymouth County Beekeepers give bee demos in their outdoor screen house. This eight-foot-square structure sits outside their bee building and alongside the front entrance. A wooden clock tells when the next show will be. At designated times, a beekeeper goes in, usually suited up, and works the hive. He smokes the hive, pulls out frames, manages supers, locates the queen, and other activities. From time to time, he brings the frame close to spectators. John Phillips, one of the demonstrators, says, "People really crowd around. It's a real attention grabber."

What are other active possibilities? How about demonstrating an extractor and letting folks have a try at it? Create a bee game on a large board and let people play. Have a giant bee that children can ride on. Show how far bees travel from their hive using a map containing bee models on string, and let visitors play with it. Put on a bee performance, a short skit in which you reveal a principle of bee life. For example, two bees talk about being robbed of their honey by the beekeeper. Or two bees talking about the need to replace the old queen. Gather a collection of honey jars from all over the world and let visitors handle the containers. Produce a video of beekeepers saying what they like about the pastime and run it for visitors.

- Give out handouts. Visitors also like to take things away with them. Possible offerings include anything from a handout of the club's activities, to the club's favorite honey recipes, to a question and answer sheet about bees, to amazing bee facts, to people to contact for bee information. How about handing out a bee bookmark? How about a bee badge? The handout can be simple – an 8½" x 3¾" (8½ x 11 cut into thirds) card stock sheet. Perhaps the club artist could do an arresting hand drawing for the handout. Make the handout useful, and you will be performing a public service.

It may be possible to convert handouts into sales. For example, your club might sell a recipe book along with giving out the handout. While handing out the recipe sheets, the volunteer can pull out the recipe book and tout its offerings. Or along with a bee info handout, the club might sell a book about beekeeping. Consider putting out these more substantial offerings yourself. How about a handmade photo pamphlet featuring club members doing different bee tasks?

Claire Desilets, secretary of Barnstable County Beekeepers, obtains several boxes of the national honey recipes and gives them to volunteers to hand out. In addition, Barnstable club members use their bee fair to publicize their next meeting as well as to enlist bee school students. Desilets says, "Last year, we signed up 60 people for the bee school. We view the fair as a real opportunity to increase our membership."

- Make honey sales equitable and accountable. For many hobbyists, the fair is their solo chance to sell honey. At the same time, it's the sideliners' and commercial operators' chance to make some good income. Balance these two groups' needs by being fair and equitable. At a bee meeting, announce the opportunity to sell honey at the fair. Explain what is involved and how members can offer their honey for sale. Provide guidelines that state percentages (80% to beekeeper/20% to club, 90/10% – whatever), labeling requirements, content, etc. Send this information to all members, not just meeting attendees. All too often, clubs tend to keep this as a little secret among the select few club leaders, and don't broadcast the opportunity. This is wrong and provincial: Honey sales are one way to gain interest and attention among the membership. The next step is to set up a system of insuring quality and equal access. Then, tie this system into a scrupulous accounting procedure.

Stanley Sample, of Essex County Beekeepers, explains how his club handles bee product sales: "Everybody in the club can sell his honey and it's done fairly. People bring in their products to a meeting. Every beekeeper is assigned a number and he places that number on his product in white indelible ink. Every item has the club label. Then every item goes through a quality control check, and the unacceptable products are rejected. Members whose merchandise is accepted must volunteer four-hour shifts, according to how much stock they offer. When we set up product, we set up so that everyone has an equal chance of selling his or her product. If someone has one carton

of honey and someone else has three cartons, we take out equal amounts from each carton. We make sure there is no discrimination between sellers. That's important."

Bill Wiley adds, "With a club label, there's no explaining how one brand is different from another. There's cooperative selling."

Sell by a rule. For example, equally from each supplier as long as stock lasts. Or sell by percentage of stock offered. Following the rule will eliminate bias, which is important. Many beekeepers can recount the time they were treated unfairly at a fair, and therefore, dropped out of the organization. At the same time, whichever tallying system you use – numbers, color-coded dots, or whatever – give a detailed accounting both orally and in writing, at the next meeting. List who put in honey, how much was sold and how much was unsold. Again, many clubs keep this quiet, and in fact, general member are often kept in the dark.

- Provide guidelines for dealing with people and selling product. Too often, volunteers appear and make up their own spiel. A better idea is to suggest several possible dialogs. At a meeting, review the dialogs by doing role playing. Send sheets spelling out these dialogs to all volunteers. The volunteer doesn't have to use the dialogs, but often, he might want to, or he might prefer to incorporate some of their ideas into his talk.

One goal of orchestrating the dialogs is greater honey sales. For example, include in the dialog the pitch that the honey sold at the fair is so much better-tasting than processed honey, and the explanations of why this is so. The volunteer could simply use that as a springboard to suggest that the person purchase a jar and compare it with a supermarket offering. An actual on-the-premises sampling is even more effective. Local boards of health may forbid this, so check first.

Clair Desilets says that the Barnstable club's approach is to try to keep selling to a minimum. Desilets says, "Our emphasis is not the selling. Rather it's educating. We only allow honey products to be sold. We won't sell honey-ingredient items such as fudge or candy." That's fine, too, but these policies should be spelled out in advance. As a guide to what's possible, the Essex County Beekeepers sold over two tons of honey and grossed over $30,000 at the 1995 10-day Topsfield Fair.

Make sure you advertise the time of the live bee display so people know when to come back and see the action.

As for difficult visitors, Sample says, "We don't have much problem. We tell our volunteers that visitors want the basics. They don't want to get into a detailed discussion. From time to time, you will have a wise guy who asks a hard question. Typically, that person is a beekeeper who's trying to trick us up. If we don't know the answer, we often admit ignorance, which ends the conversation."

To combat pilferage, fair chairmen advise volunteers to watch out for shady-looking characters and teenage groups on the prowl. If you suspect someone of stealing, ask politely if he or she paid for the honey. Often the person will become flustered and admit he hadn't. But if he said he had, corroborate the assertion with the volunteer who was supposed to sell the product. Beyond that, there's not much you can do. The best policy is vigilance.

Think about these suggestions, and come up with new ideas for your fair this year. Don't get bogged down in doing it the same way it's always been done. Innovate, and your fair will be a success. BC

Howard Scott attends fairs, keeps bees and writes about both from his home in Pembroke, Ma.

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zen. And the Art of Removing Stinging Insects

Charles Simon

Removing any stinging insect from any location they choose is a difficult task. It takes a special frame of mind, not to mention the right tools.

I got a call from a man who loves yellow jackets. He was upset because he was under indictment for removing them without a license. Where do you get a license for that? Am I in danger of being busted? Do I have to start worrying about that, too?

The city of Santa Cruz sent me a letter telling me that I needed a million dollars in liability insurance in order to be able to continue to work for them. I called them up and told the lady that it was a shame, because I only worked for them when they had an emergency. She agreed with me that it was a shame, and called me back three days later to tell me that she had consulted with the city's "danger evaluationist" (Do they really have one of those?), who told her they would waive the requirement in my case.

Everything is against the beekeeper, it seems. But it's to no one's benefit to be against the remover. This is a crazy world!

I used to love yellow jackets, too. Now I'm not so sure.

I have a fever and aches in my neck, back, chest, shoulders, arms and fingers, like a flu. You know why? Yellow jacket stings from four days ago, seven of them. And yellow jacket pain is not *just* garden variety pain. It works and grinds away at you and doesn't let you rest until it's through with you. And after that, the areas are going to itch for days.

It could not be helped. I *was* wearing my suit, veil and gloves.

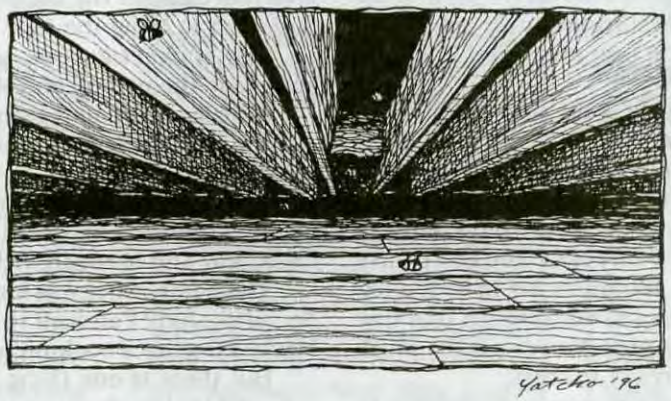
My advice concerning bee and yellow jacket removal is: Don't do it. I will continue to, though, because I've been doing it for more than 25 years. It's the law of inertia; I don't know how to stop.

The homeowner had called two generic exterminators. The first quoted him $150 for the job. The second told him $70 to $80, but he wasn't sure and had never done it before, so he gave the man my number. I did it for $75, but I should have charged triple.

A bee or yellow jacket colony in good condition in a location that they have chosen and developed on their own is not something to trifle with. They're like having a bomb in your yard or the wall of your house – not a problem unless something triggers them off. And you never know when that's liable to happen or why.

One woman was outraged that I wanted to charge her $75 three years ago to eliminate a yellow jacket nest from her wall, so I didn't get the job. She called last year, anxious to pay. The yellows had attacked her neighbor's cat and cost her a $100 vet bill.

Most of the jobs go off without a hitch, and it seems like an easy way to make good money. That would be true, but for example, last month I only had two jobs, both for the city. And when the jobs are few and far between, you still have to be set up and ready to go on short notice. If you got involved in something else, you won't be there when they need you.

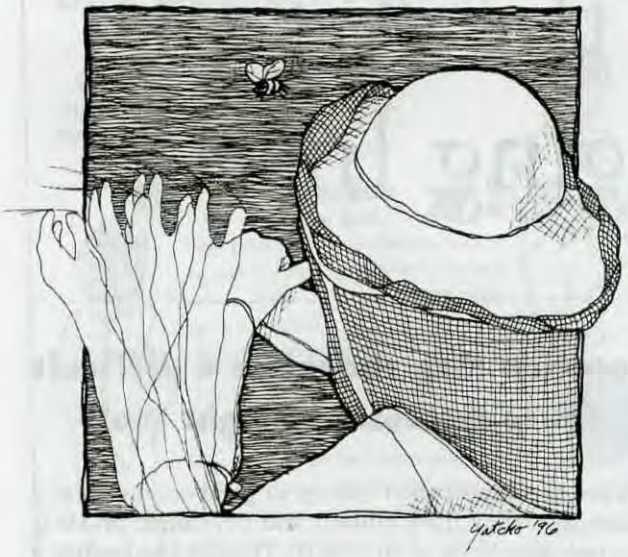


The problem with the seven-sting job was the location of the nest. There was no way an exterminator could have sprayed poison into the hole because there wasn't a hole. The bees were going in underneath the shakes of the roof, traveling a foot and a half and then slipping through a hole in the tar paper. A section of the roof would have to be removed to access them that way.

The nest was exposed in the eaves in the attic. The only way to get at it was to crawl on your belly pretty far over the rafters. It would not have been a real good idea (if it ever is) to poison the bees, because you would be in there with them. You would be poisoning yourself. In a very real sense, that's what you do everytime you use poison, but this time it was inescapably obvious.

I told him I would do it, and he wanted to know when. I said in three days. He asked me why so long, and how was I going to do it. I told him I needed the time to formulate a strategy because I didn't want to die, and I didn't

Continued on Next Page



ZEN ... Cont. From Pg. 423

know how I was going to do it . . . yet. He was a smart man, he could see the problems, and he admired my honesty. I went home to start thinking.

And this is the plan I came up with . . .

First, I would carefully slip in there and position a drop light next to the nest. Then I would suit up and crawl back in with the vacuum cleaner attached to my plastic-bucket apparatus.

The yellows, disturbed, would head for the light, while I, completely unnoticed, would surreptitiously suck them up. Then I would break up the nest and clean it all out. Simple. Ingenious. Foolproof.

Well, nearly. 90%. And that 10% that didn't work right was, and is, very painful.

First of all, crawling on your stomach over rafters in the dark is not what you would call a piece of cake. Add to that your bee suit, veil and gloves. And did I tell you, there's no air up there, and it's very hot? You can't carry all the equipment in one trip, so you've got to do it a few times. Then you've got to go in and out through that tiny hole and up and down the ladder. You're pretty much worn out by the time you're ready to start.

You have to work on your stomach, stretching to reach the action. But the bugs don't come out fast enough. You're stiff and sore and completely soaked with sweat and have barely gotten started. So you bang on the paper wall of the nest and knock a hole into it and then suck them up as they come out. But that's not fast enough either, so you do it more. Soon there are yellows crawling all over. And eventually you have to shift your position, and that's when you get the first sting – right in the stomach. And that's where Zen comes in. You have to let go and take it without reacting. And while you're busy not reacting to that one, you get another one, in the shoulder. Now you have two to not react to.

But the job is going perfectly. Well, nothing is perfect. There is a change. The vacuum is not sucking them up. You stick a finger in the end. It's clogged with yellow jacket paper. You have to turn it off, and immediately yellows start escaping the bucket from the space around the hose attachment – and you didn't bring the duct tape. You work fast but you can't unclog the hose up there. You have to take it outside in order to shake it out, and you really don't want to have to go all the way out there.

And did I mention the black widows? There is not two inches in the entire attic that is free of their webs.

It's only been a half-hour, but a half-hour on your stomach, over rafters, stretching as far as you can, holding your head up, but not high enough because the roof is inconveniently positioned is a long time, and it takes just about all you've got just to crawl out of there.

I shook the hose and banged it on the ground, but nothing came out. So I unzipped my veil and put one end to my mouth and blew. Out came the debris, along with a couple of hundred real mad yellows which made a beeline for my face. I did get the veil down and zipped in the nick of time. That's what being experienced does for you, nothing when nothing goes wrong, but quick and correct reaction in a crisis.

Then back up in there. And it was as hard getting in as it had been getting out. I found that hundreds of yellows had escaped the bucket while I was gone, and I had forgotten to bring the tape. Well, when the vacuum was on, they couldn't get out, so I turned it on and left it on and made the painful and slow excursion back out.

I finally got it all together and went back to work.

I received a sting in the chest, another in a thumb, another in a finger. But it was going right. I was in my element. Meditating. And for the next two hours, I stayed in one extremely uncomfortable and painful position, but I was okay and in touch with Zen, and I got the job done.

The homeowner was impressed. I earned my money. Sound like fun? You want to be a stinging insect remover? Maybe I'll write a book on how to do it.

But there is one thing I have not been able to find out, and that's who buys yellow jackets. The removers who know won't tell me. I wonder why. If anybody out there knows, please let me in on it, because I don't like wasting them. BC

Charlie Simon keeps honey bees, and removes all manner of bees, wasps and yellow jackets from nearly anywhere. He has had numerous stories here before.

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This is a good time of year to give your local paper, T.V. and radio news outlet a friendly reminder about stinging insects, and what to do about them. You should follow this up with a phone call (maybe a visit) and, as a representative of the local beekeeping group, persue a story on what's important to your group at the time. This makes for good, free publicity.

NEWS RELEASE

The _____ Beekeeper's Association reminds you that this is the time of year that hornets and yellow jackets become most abundant and most annoying.

_____, President of the group, says that these other pesky bees are often confused with honey bees and as a result, beekeepers take the blame. He adds that honey bees rarely cause problems around homes or picnic areas while hornets and yellow jackets actually seek these areas out in search of food for their young.

Below are some common sense guidelines to follow while outside this summer, especially when having a get-together in the backyard, or a park or camp ground.

- ✓ Wear smooth, tan or white colored clothing.
- ✓ Avoid excess hair spray, perfume, cologne or sun tan lotion.
- ✓ Do not rely on insect repellents, they are not effective on ANY of these pests.
- ✓ When outside, keep sweets like candy, cakes, cookies and the like covered, and avoid spilling crumbs, if possible.
- ✓ Keep glasses or bottles holding beer, pop or juices to a minimum.
- ✓ Promptly dispose of empty containers, wrappers and fruit peelings as they attract pests. Keep your area neat.
- ✓ Before choosing a picnic site, scout the area briefly to locate any obvious nests. Remember where to look, and what to look for.
- ✓ Check with nearby picnickers to see if problems exist, or if they are inviting pests. Avoid them if possible.
- ✓ Don't leave food unattended for long periods of time.
- ✓ Always, *always* double check a glass or bottle before drinking from it.
- ✓ Prepare foods, especially grilled meats in a timely manner, and don't leave that last hot dog on the grill.
- ✓ Clean up plates, dishes and glasses when finished and rinse off, dispose of, or keep covered.
- ✓ If one of these insects lands on you, *gently* and *slowly* brush it off. Do not panic, they are not looking for a fight, just for lunch. Swatting, waving and bouncing will only aggravate them. Slow, gentle movements will not be threatening. Foragers are not protecting a nest, and tend to be non-aggressive unless threatened when away from it.

_____ says that honey bees only seek sweet liquids, not other types of food. He adds that honey bees are golden brown and fuzzy, while the other two pesky bees are NOT fuzzy and are shiny yellow and black.

Practice common sense when outside, keep your picnic areas tidy and keep your eyes open – you'll easily avoid problems this summer.

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Richard Taylor

Bee Talk

"Recovering from mites, winter and queenlessness."

The Winter that just ended was, without doubt, the worst in the history of American beekeeping. The devastation caused by parasitic mites was exacerbated by an unusually severe Winter followed, in the Northeast, by a wet Spring. We hardly had any Spring. There was snow on Mother's Day, and then, less than a week later, hot Summer, with several scorching days in a row, temperature up in the 90s. My bees got hit hard, partly because I misread the signs. A very few of my beekeeper friends, who did things right, came through in great shape. And doing things right means, these days, knowing how to deal with mites. I think I have learned my lesson.

It's been an expensive one. I've been reviving my apiaries with package bees. I installed the first 15 packages on April 22, I think it was. The day was cloudy and cold, not good for installing packages, but I wanted to get it done. My method is simply to remove three combs, dump the bees in, replace the combs, poke a little hole through the candy end of the queen cage to make it easier for the bees to chew through, put the queen in where the bees are, and close up the hive. It began to rain just as I was getting finished, and that's when I noticed an awful lot of bees beginning to cluster on one of the hives. Evidently one of the packages was not staying put, but was joining up with another. I learned why a couple of days later. One of the queens was dead in her cage and the bees had, of course, abandoned that hive in favor of one having a queen.

Now the colonies are beginning to build up. Some are a lot stronger than others. I'll wait another week or so, then do a little equalizing by swapping empty combs from the weaklings for combs of sealed brood from the strong ones.

I've got more packages coming. I couldn't get them when I wanted them because the demand was so heavy. I'll get those installed in my other apiaries, and then make some splits to get all the hives revived. But I don't expect much honey from these late starters. My aim is to have strong colonies by the end of the Summer. A hive without bees is worth very little, even if it is filled with honey, but one with bees in it is worth a lot.

I went over today to the apiary I revived about a month ago with the 15 packages. The dandelion bloom was profuse – whole meadows covered with dandelions. That will be of some use to the bees, but only to help them build up. They really don't need the dandelions because the hives are already very heavy with honey from last Summer. And the colonies are still much too weak to get any surplus honey. It will be awhile before the first supers go on. Normally I'd have supers on the hives now, and they would be filling up from the dandelions and the fruit bloom. But not this year. In fact, there are not many bees on the dandelions. We know why. It makes me wonder what the apple harvest will be like. I expect a lot of misshapen fruit from inadequate pollination. A total stranger phoned me yesterday to ask why there are no bees around this year. He's not a beekeeper. He's a nature lover who watches for these things. I explained to him about the mites.

It is somewhat dispiriting. But when I went over to that apiary today, my spirits began to revive. The old smoker smelled good, and it even seemed sort of good to get a couple of stings.

Things will get better for us. They've got to. Maybe the mite infestations will turn out to be cyclical. In any case, it is but a matter of time before we have bees that are resistant to mites. There are strains already that have inherited the tendency to attack *Varroa* mites and pitch them out of the hive. It's biological survival. The bees that don't learn how to do this will perish, and those that do catch on will propagate their kind. It has already happened in some parts of the world.

Now I did see something interesting at that apiary this morning. It was a queenless colony. Evidently the queen was dead in her cage or something (I didn't notice), but there was no brood at all, and no queen, and it was a very weak colony. But lo! There was a capped queen cell! It wasn't just a little runt cell, but a nice long one. How can that colony be raising a queen? There has been no brood in that hive since last Fall. Where did they get the egg? Certainly the queen I introduced with the package did not emerge from her cage, lay one egg, and then disappear. There was no other trace of brood.

This is something I've noticed before, when making up nucs and splits – a hopelessly queenless colony with a queen cell and no other brood. And there are lots of beekeepers who have struggled to requeen colonies that they were sure had no queen, only to find, weeks later, a laying queen there.

Where did the egg come from? Did the bees steal it from another hive? This queen cell I saw today is in a hive right next to the only colony in that apiary that survived the Winter. So there were eggs there, in case any of these queenless bees had the temerity to go steal one of them. That really taxes credulity though. The only other possibility that I can think of is that a worker bee might somehow lay a fertilized egg. That, however, is even harder to believe. It violates the most basic principle of bee biology. And besides, if that were possible, why would we ever get laying-worker colonies?

Well, some bee scientist can earn quite a bit of fame by solving that mystery. I hope I'll still be around when the solution is found. BC

Questions?

Side Doors

Q I am told that in England, the hive entrances are on the side of the hive rather than the end. Is there any advantage to that?

Dan Brown
Port Angeles, WA

A There are many styles of hives in England, and it is common there to have side entrances, but there are many beekeepers here who do that, too; that is, they construct the bottom board with the opening on the side rather than on the end. The only reason I have ever heard given for this is that it is easier, standing behind the hive, to remove the combs. I would not like that arrangement because I think it is important to tilt the hives forward in Winter, and if the entrance were on the side, then the combs would not hang vertically.

Easily Recognized?

Q I have heard of beekeepers who do not use smoke, but instead, bring with them to the apiary some sugary treat, which, they claim, pacifies the bees. Are bees then susceptible to Pavlovian conditioning? Will the sight of the beekeeper incite in them friendly behavior if they have learned that his presence means sugar for their coffers?

Mark Staples
Northampton, MA

A There is no doubt that bees have a capacity to learn, to a degree remarkable in any insect. For example, they learn their way back to their hive from miles away, they learn the location of special food sources, and so on. If a beekeeper rinses sticky equipment in the yard at about the same time each day, they seem to learn that approximate time and anticipate his action. Bees can learn, when necessary, fairly complex routes in and out of a honey house, through an obscure crack, and can, when necessary, establish totally new routes to and from their nest. There is, however, no possibility, in my opinion, that they can learn to identify their owner, nor is it likely that they can become conditioned in the manner here suggested. Bees have short lives, and their role as guard bees is even shorter. I believe the way some beekeepers substitute sugar syrup (or peppermint or whatever) for smoke is with a misting device or fine spray, causing the bees to turn their attention to this.

Tall Tales

Q I see pictures in bee magazines of hives with six to eight supers on them. Wouldn't two or three be enough, by extracting the honey as it becomes capped over and reusing the supers?

Steven Gilchrist
Waterloo, AL

A Sure. Sometimes you see pictures of hives 10 feet high in the magazines and books, their proud owners standing beside them, but you don't often see hives like that in real life. If you are going to publish a picture of one of your hives, you might as well make it a good one. Of course, supers can be harvested at mid-season, then used again for the later flow, thus saving equipment.

Catching Swarms

Q An old-time commercial beekeeper told me of the following method for avoiding losing swarms. He said to set up empty hives containing at least some drawn comb, about 100 to 400 yards from the apiary, and to bait them every week or two during the swarming season by pouring a cup of honey across the combs. Thus the field bees become familiar with these hives and, when a swarm emerges, they are likely to go there. It sounds plausible. Does it work?

Gary Starbuck
Santa Fe, NM

A My experience with this sort of thing has been inconclusive. I have set bait hives around in the manner described, but without baiting them with honey, and gotten no results. On the other hand, I have often found hives that had perished over the Winter taken over by swarms before I got around to cleaning them up. And, like many other beekeepers, I have found stacks of supers I had stored outside with drawn combs in them taken over by swarms, even when there were paradi crystals in them. Concerning the method you describe, I should think it would work, at least for getting some of the swarms, but you should have the bait hives well up off the ground – ten feet, if that is not too difficult, but at least two or three feet. Let us know how it works!

Eating Pollen

Q How should pollen be preserved for home use? And how much is recommended for the average adult?

Name withheld by request

A Pollen should be harvested from the pollen trap when it is dry, and it should be kept dry. After that, it should be kept in an airtight container in the freezer. It is nothing but a highly concentrated protein, so it does not matter how much one consumes, within reason. Claims for extraordinary health benefits from pollen appear to be quite groundless.

Continued on Next Page

Answers!

Richard Taylor

Lifting Supers

Q In one of your books there is a picture of you raising two supers with one hand while inserting an escape screen under them with the other. I marveled at your prowess. I'm 71, and I tried that and didn't even come close. Is there a special trick to this?

Andrew A. McKinnon
Silver Lake Village, OH

A Yes, there is a simple trick to it. I am five years older than you and have no trouble at all doing this over and over. The trick is to draw the two supers back toward you an inch or so, after prying them loose, then just raise the end nearest you, using both hands if need be. Once they are tilted up, you can reach down and pick up the escape screen with one hand, holding the supers tilted with the other, slip the screen under the supers, and lower them back down. Note that when the two supers (or even three, for that matter) are supported at one end by the hive underneath, then the end that you lift up weighs only half as much; moreover, once they are tilted up, to a near balance, they weigh very little indeed, all the weight being borne by the hive underneath, and they can be held that way with one hand for a long time.

Cleaning Plastic

Q I use an observation hive for demonstrations at schools, churches, fairs and so on, and to eliminate the problem of glass breaking, I have substituted plexiglass, which is hard to clean. Do you know a way to clean plexiglass without damaging it?

Jim Harris
Columbus, GA

A I do not, but suggest you experiment with common solvents like alcohol, paint thinner, etc. Your question gives me a chance to make a suggestion, however. The most common cause of glass breaking in observation hives is the difficulty of removing the glass after the bees have gotten it stuck in with propolis. This is overcome by spreading a bit of vaseline on the edges of the glass before inserting it in the observation hive.

Send in your questions. Make them brief and to the point, and send them to: Dr. Richard Taylor, Box 352, Interlaken, New York 14847 (not to Medina) and enclose a stamped envelope for response.

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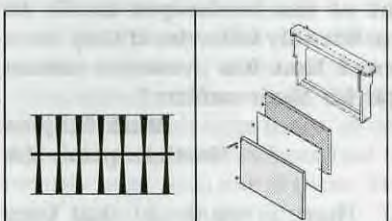

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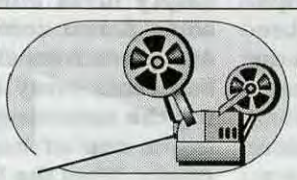

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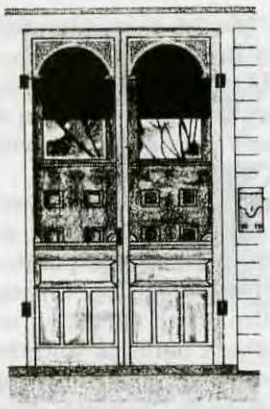

Ann Harman

Home Harmony

Barbeque Time

July is an excellent month for picnics and cookouts because the kitchen is too hot, and the food tastes better from the grill anyway. The garden is producing all sorts of vegetables, good for salads as well as for being cooked on the grill. What are you waiting for? While the grill is heating up you can choose a recipe and get ready for a delicious meal.

SUNSHINE CHICKEN THIGHS

1-3/4 pounds skinless chicken thighs
1/4 cup frozen orange juice concentrate, thawed
1-1/2 tablespoons honey
1 tablespoon oil
1 tablespoon lemon juice
1/2 teaspoon paprika
1/4 teaspoon turmeric
1/8 teaspoon hot red pepper flakes
few drops Louisiana-style hot pepper sauce
1 large clove garlic, minced or pressed

With small, sharp knife, make 3 to 4 vertical slashes in each thigh. In large bowl combine orange juice with remaining ingredients. Add chicken and turn to coat with marinade, rubbing seasonings into slashes. Cover and refrigerate 1 hour or overnight. Prepare grill for cooking. Remove thighs from bowl; grill 5 to 6 inches from heat source for 20 to 30 minutes, until cooked through, turning 2 to 3 times during cooking. Makes 4 servings.

Perdue Grilling Greats
Perdue Farms, Inc.

ROTISSERIE ROASTER RECIPE CHINESE STYLE

Here is a recipe for those of you who have a rotisserie on your grill. If not, and you have a grill with a domed cover, you can still roast this chicken.

1 roasting chicken
salt, pepper
paprika
crushed garlic
melted butter or vegetable oil
1/4 cup soy sauce
1/4 cup honey
1/4 cup lemon juice

Season chicken inside and out with salt, pepper, paprika and crushed garlic. Center on spit of rotisserie and secure. Tie drumsticks together and secure wings. Time for preheated oven-type grill is about 15 minutes per pound. For an open rotisserie, cook 30 minutes per pound. Roast chicken should be well-browned and the leg should move easily. Baste frequently during last hour of cooking with the mixture of soy sauce, honey and lemon juice. If rotisserie is very hot, reduce basting time.

The Perdue Summer/Winter Oven
Stuffer Roaster Cookbook

ORIENTAL SHORT RIB BARBECUE

This next recipe is adapted from the winner of Best of Beef 1988 National Beef Cook-Off. It is simple and very good. Have the meat retailer cut the beef short ribs crossways in pieces 3/8 to 1/2 inch thick. Each slice will have 3 or 4 cross-cut rib bones.

2/3 cup thinly sliced green onions
1/2 cup soy sauce
1/2 cup water
1/4 cup dark-roasted sesame oil
2-1/2 tablespoons flavorful honey
1-1/2 tablespoons toasted sesame seeds, crushed
1 tablespoon minced garlic
1 tablespoon grated fresh ginger
1/2 teaspoon ground red pepper
1/8 teaspoon crushed red pepper pods
4 pounds well-trimmed beef short ribs

Combine all ingredients except ribs in large plastic bag. Mix well. Add ribs and turn to coat. Marinate in refrigerator 4 to 6 hours, or overnight if desired, turning occasionally. Remove ribs from marinade and reserve marinade. Place ribs on rack over medium coals. Cover with either lid for grill or with tent of heavy-duty aluminum foil. Grill 10 to 12 minutes, turning once and brushing with marinade before turning. Makes 12 servings.

Great Grilled Beef
Beef Industry Council

APPLE BUTTER GRILLED CHICKEN

Every once in a while a recipe appears that has some unusual ingredients - not necessarily unusual in themselves, but unusual in their uses. This next recipe is like that, but it does turn out very good because the blend of flavors is wonderful.

1 broiler/fryer chicken, quartered
1 medium onion, minced
1 cup apple butter
1/2 cup apple cider vinegar
2 tablespoons honey
2 tablespoons margarine
3 tablespoons prepared mustard
1 teaspoon celery seed
1 teaspoon salt
1/8 teaspoon pepper

In saucepan, make sauce by mixing together onion, apple butter, vinegar, honey, margarine, mustard and celery seed. Bring to a boil (sauce will be rather thick). Remove from heat and allow to cool. Put chicken parts in a large bag and pour the sauce over, turning parts to coat well. Marinate in refrigerator at least 1 hour. At grilling time brush off excess sauce. Place chicken on covered grill; (if grill has no top, make tent of foil). Place chicken, skin side up, about 8 inches from heat. Grill, turning every 15 minutes, for about 1-1/4 hours or until chicken is done. Brush generously with sauce during last 15 minutes of grilling. Sprinkle with salt and pepper. Makes 4 servings.

The Chicken Cookbook
Dell Publishing Co.

If you have any special grill recipes and would like to share them, send them and next summer we'll find more ways to enjoy our outdoor kitchens. BC

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?Do You Know? Answers

1. **True** Temperature is one factor that has a significant modifying effect on insecticide residues. Cold nights often increase the persistence of spray residues enough to be a hazard to bees the day following application.
2. **False** A queen excluder must be used in the production of cut comb honey, whereas, none is needed when using square or round section supers. The sections act as a natural barrier to the queen.
3. **True** Standard 10-frame size honey supers are normally used for all types of comb honey production.
4. **False** Honeydew is a sweet liquid excreted by insects with sucking mouthparts, principally aphids (plant lice) and scale insects, feeding on plants. It is frequently gathered and stored by bees and is considered inferior to honey in flavor and quality, but prized in some areas as a delicacy.
5. **False** In a colony without a queen, the absence of inhibitory queen pheromones, the ovaries of many workers enlarge and become functional. These laying workers lay only unfertilized eggs because they cannot mate. Any age worker can become a laying worker in the absence of a queen.
6. **False** Queens do not have to go on a mating flight in order to lay eggs. If a queen is prevented from going on a mating flight for more than twenty days, she will lose the urge to mate and become a drone layer, only capable of laying unfertilized eggs.
7. **False** Purple brood is not a bacterial disease of honey bees, rather it occurs when adult bees collect and use the pollen and nectar from southern leatherwood or titi.
8. **True** While colonies may be completely destroyed by pesticides, most often only the field bees are killed. In this situation, beekeepers may not even realize that they have suffered a loss.
9. D) Basswood
10. B) W. S. Zbikowski
11. E) Butyric anhydride
12. Contact poisons- absorbed through the integument.
    Stomach poisons- enter alimentary canal with food sources or cleaning activities.
    Fumigation- enter the respiratory system through the spiracles.
13. 6 5/8", 5 11/16 "
14. The use of herbicides to control weeds is seldom physically injurious to bees, however, herbicides have significantly impacted the beekeeping industry by reducing nectar and pollen sources in many agricultural areas, along roadsides, ditch banks etc. It has changed the value of many beekeeping locations and caused beekeepers to engage in migratory beekeeping practices in order to build strong colonies for pollination and honey production.
15. Systemic insecticides applied to the plants are absorbed by the plant and remain in the plant tissues for a period of time. Application of insecticides near the time of flowering could result in the insecticides being present in the nectar and pollen when the plant starts to bloom.
16. MITE-A-THOL (menthol)
    Apistan Strips (fluvalinate)
17. There are three drawbacks to bottom supering. The first is that it is more work than top supering since all honey supers already on the hive have to be removed. The second is that the queen may enter the empty super if there is no queen excluder and begin to lay eggs. The third consideration is that if the honey flow stops before the supers are filled, then there may be a large number of supers only partially filled with honey.
18. **Fume board**- Modified covers covered on the inside with an absorbent material and painted black on the outside top. Chemical repellents are sprinkled on the absorbent material and the fume boards are placed on top of honey supers. The fumes drive the bees out of the supers prior to their removal from the hive for extracting.
    Drip board- A drip board is used beneath honey supers that are waiting for extraction. They catch leaking honey from broken burr comb so that it does not drain on the floor.
    Follower board- A thin board used in place of a frame when there are fewer than normal number of frames in a hive. Helps decrease the amount of burr comb built. Sometimes they are also called dummy boards.

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

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


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Gleanings

JULY, 1996 • ALL THE NEWS THAT FITS

HONEY BOARD REFERENDUM

The five-year re-authorization referendum for the National Honey Board has been scheduled for August.

USDA's Agricultural Marketing Service has developed a draft ballot for the referendum. The ballot has just one question:

"Do you favor continuing the Honey Research, Promotion, and Consumer Information Order? ( )Yes ( )NO

The proposed changes to the Honey Board program, to include funding for beekeeping research and honey adulteration policing, will not be included on this ballot. Legislation to authorize that expansion is being prepared, but it will likely not be taken up during the current session of Congress.

The ballots will be mailed to National Honey Board assessment-payers in late July/early August and must be returned by August 30 to be counted.

Included in the ballot is a certification on the quantity of honey the voter either produced or imported during the two-year period of 1994 and 1995. Referendum rules require, that for the Honey Board to be terminated, it must be approved by a majority of the voters in the referendum and the majority must have produced and imported a majority of the honey among those voting.

MI QUEEN

The Michigan Beekeepers Association have selected Nicole Lee Alessandri for their 1996 Michigan Honey Queen. Nicole is the daughter of Fred Alessandri and Debbie Gallivan. She is from Macomb Township and is presently a senior at Chippewa High School.

NEW TO ERS

Susan Offutt was recently named administrator of USDA's Economic Research Service (ERS). In this position, she manages the USDA agency that provides economic and social science information and analysis for public knowledge from research and database development activities. That knowledge is used to provide timely, analytically-based information about conditions and changes in the food and agricultural system and the rural economy and likely effects on U.S. agriculture and rural America. As an alumna of ERS, Offutt is no stranger to the agency she leads. She rejoined ERS from the National Research Council of the National Academy of Sciences where she was the executive director of the Board on Agriculture and assistant executive officer.

SEND US YOUR MEETING NOTICES AT LEAST 2 MONTHS IN ADVANCE

OBITUARIES

Dr. Lonnie Nathaniel Standifer died March 14, 1996 after a prolonged illness. He was born October 28, 1926 in Itasca, TX, one of 10 children, to Emma and Nathaniel Standifer.

Stan, as he was affectionately known by many of his co-workers, received his early education in TX, earning a B.S. degree at Prairie View A & M University in 1949. He received his Masters of Science degree from KS State Univ. in 1951, and a Ph.D. in Entomology from Cornell Univ. in 1954. Stan held teaching positions at Tuskegee Institute, Cornell Univ. and Louisiana's Southern Univ. before he was hired in 1956 as an Entomologist by the USDA's, Agricultural Research Service, Tucson, AZ. Specializing in honey bee physiology and appointed Director of The Carl Hayden Bee Research Center at Tucson, a position he held until 1981. Stan published numerous scientific and technical papers and was a member of several professional organizations including the Entomological Society of America and The American Association for the Advancement of Science. He retired in 1983 due to ill health, moving to Fort Worth, to be near his family.

Lonnie is survived by two sisters, five brothers and a host of nieces, nephews and cousins.

Raymond Churchill, a long-time New York commercial beekeeper, died recently at home. He was 76.

Surviving are his wife, Mable; a son, Roland "Rolly," Burrville; six daughters, Rebecca Holcomb, Greenwich; Roselyn Taylor, Rodman; Rita Woodruff, Copenhagen; Rhonda Daniels, Eustis, FL; Roxanne Mustizer, Adams; and Rae Haynes, Canastota; a brother, Robert, Rutland; 18 grandchildren and 12 great-grandchildren.

Born March 22, 1919 in South Rutland, a son of Earl B. and Ida Lewis Churchill, was the fourth generation of the Churchill family to live on the family farm on Churchill Rd.

He graduated from Adams Center High School in 1938. That same year, he began beekeeping, learning from a local beekeeper, LeRoy Keets. Mr. Churchill practiced beekeeping for 57 years.

He also was a local contractor. He built more than 30 houses and several barns, and assisted in the construction of the Watertown fire barn.

He married Mable Mae Sampson in March 1944. The couple operated Churchill Honey Farms. They had lived in Burrville since 1943.

The National Honey Board has created a new recipe brochure for people who are "squeezed for time."

The 12-panel brochure includes eight quick, low-fat recipes that follow the American Heart Association's Dietary Guidelines. The full-color brochure also includes honey tips and photos.

The "Squeezed for Time, Honey?" brochure will be distributed at walks sponsored by the American Heart Assn. in several cities this October. For a free sample, write to the National Honey Board, Dept. S.I., 390 Lashley St., Longmont, CO 80501. Additional copies are available from the National Honey Board for 15 cents each.

FEEDING

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BOOKS & NEWSLETTERS

AN EYEWITNESS ACCOUNT of Early American Beekeeping by A.I. Root. The pioneers of beekeeping as close your bookshelf. Cat. No. X1, $3.69 postpaid. The A.I. Root Co., 1-800-289-7668. (TF)

PERIODICALS

RURAL HERITAGE – bi-monthly how-to, dedicated to preserving the traditional rural lifestyle, with emphasis on farming & logging with horses, mules, & oxen. Sub. includes THE EVENER Workhorse, Mule & Oxen Directory; $19 for 6 issues; $35 for 12 issues; sample $6. Rural Heritage, 281-B Dean Ridge Lane, Gainesboro, TN 38562.

WANT INFORMATION ON EXOTIC animals & the marketplace? Subscribe to Wings & Hooves. $16 yr. Dept. 1, Rt. 1, Box 32, Forestburg, TX 76239-9706.

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

DIE NEUE BIENENZUCHT Monthly magazine for beekeepers interested in German beekeeping. Hamburger Str. 109, D-2360 Bad Segeberg, West Germ.

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

BEE CRAFT – Monthly journal of the British Beekeepers Assn. Subw/postage is £13.68 surface mail to L. Connor, P.O. 817, Cheshire, CT 06410.

THE AMERICAN BEEKEEPING FEDERATION needs your support in efforts to stop adulteration, improve marketing conditions and encourage research on African Bees and Varroa and Acarine Mites. For information, membership application and sample of bi-monthly News Letter write to: THE AMERICAN BEEKEEPING FEDERATION, INC., P.O. Box 1038, Jesup, GA 31545-1038.

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

THE AUSTRALASIAN BEEKEEPER. Published monthly by Pender Beekeeping Supplies Pty. Ltd. Send request to: The Australasian Beekeeper, PMB 19, Maitland NSW 2320, Australia. Sub. $US 27.00 per annum, Surface Mail (in advance). Payment by Bank Draft. Sample free on request.

RARE BREEDS JOURNAL. Bi-monthly journal about exotic, minor & rare breeds of domesticated animals & their owners. $18.00 (U.S.)/year, $24.00 Foreign; $2.50 for sample copy. Rare Breeds Journal, Dept. Bee, HCR 1, Box 45, Hebron, ND 58638 (701) 878-4970.

CANADIAN BEEKEEPING. The news media of the Canadian Honey Industry. One year sub. (10 issues) in Canada and the U.S.A. $20. Foreign subscribers send $40. Send to Canadian Beekeeping, Box 678, Tottenham, ON, Canada, L0G 1W0.

BRITISH BEE JOURN. Monthly single copies 33p + postage. $15./yr. U.S. Annual subscription post paid. Subagent: 46 Queen St., Geddington, NR Kettering, Northants, NN14 1AZ, Eng.

Bee interested. For beekeeping information read the AMER. BEE JOUR. New editorial emphasis on practical down-to-earth material, including question & answer section. For information or free copy, write to: AMERICAN BEE JOUR., Hamilton, IL 62341.

THE AUSTRALIAN BEE JOUR. Monthly, SeaMail $30.00 (Aus.), AirMail $50.00 (Aus.). Write to: Victorian Apiarists' Association Inc., Editor, Ms. Judy Graves, 23 McBride Rd., Upper Beaconsfield, Victoria, 3808, Australia. Sample $3 (Aus.) on request.

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

THE GIBSON LETTER. A monthly newsletter that takes another look at beekeeping news. Edited by Glenn Gibson. Subscription - $48/year. The Gibson Letter, P.O. Box 368, Minco, OK 73059.

SOUTH AFRICAN BEE JOURNAL. The official organization of the S.A. Federation of Bee-Farmers' Associations. Published bimonthly in English and Africaans, primarily devoted to the African and Cape Bee races. Subscriptions including postage (six copies). 1995 all subscribers outside of South Africa R100-00 surface mail, payment to be made in S.A. Rands. NB. Sample copies only available on receipt of a donation. P.O. Box 41 Modderfontein, 1645, South Africa.

BOTTOM ... Cont. From Pg. 438

to dodge or react or, usually, even to see. There is nothing to be done in such a situation. But it sometimes happens that a bee will wonder whether or not you must be stung. Then she will land on you, usually on your face, landing "like a linebacker." It is easy enough to distinguish this from the soft landing she makes when she is treating you as if you were a bush. But since she has not stung you immediately, you can know she has not yet made up her mind. And if she hasn't, she won't if you remain absolutely still or only move very deliberately away. It may take her a few minutes to become reassured, but if you are patient, eventually she will fly off. If, in the meantime, she walks around, it will feel like she is biting you. This is because instead of "feet," her legs end in hooks and these tiny needle points really prick tender skin. Finally, the third mode of defensiveness is used when she has no intention of stinging at all. Then she goes into her harassing mode and flies round and round your head, with her wings beating at a higher-than-normal frequency. All she wants then is for you to back off and, if you do so, she'll leave you alone. Unless you hit at her, of course, then all bets are off. BC

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Display Index

One of the best things about keeping bees just for fun is that you can take the time to be just as gentle as you want to be. This is a description of the tiny steps I have learned from here and there, so you can see if you have thought about all of these. Maybe you have some more to suggest to me.

Jarring shocks distress bees more than anything else. These can be tough to avoid, what with the bees' fondness for using propolis, even more so when the propolis gets old and hard. One trick which everyone may not use is to turn the hive tool around (or what I think of as "around"). When the short, angled end is inserted between two frames and the blade of the tool swung sideways, parallel to the top bars, the 1½-inch width exerts a very high leverage, high relative to the force you exert on the end of the blade. High leverage limits the amount of "jump" when the propolis lets go, thus lessening the amount of jarring experienced by the bees.

There is a right way and a wrong way to insert the tool, too. The wrong way is such that, after being inserted, the tool has to twist through the space between frames, risking crushing some bees. If, instead, the tool is inserted in just the position to begin prying, there is no way for bees to be between the blade and the frame. And select the initial direction of twist so that the edge of the blade to exert the force on the frame to be moved is closest to the hive body. When the space between the frames is full of bee faces looking up at you, if you gently press the tool against those faces, they will back down out of the way.

Covering the opened top of a hive body seems to pacify the bees, too, causing them to move off the top bars and back down into the spaces between the frames. A piece of old sheet, roughly 20 by 24 inches, works fine. If a tube is sewn across each of the short sides, sticks can be inserted in them to keep the wind from blowing the sheet off. Use two, one to cover the frames not yet inspected and the other for those completed. A third cloth often is useful to cover another exposed hive body.

It is easiest to remove the second frame from the side first, since the bees so often build bridge comb between the first frame and the side. If you have an empty super sitting on a board nearby, then that second frame can be placed there temporarily. If it is covered with a cloth, the bees will stay on it and keep it warm enough even if it contains brood. After inspecting the frame nearest the side, the third frame can be returned to position number two. This leaves a gap across which the queen is less likely to move, making it more likely you will spot her on the first pass across. If the removed number two frame is replaced in the number nine position, the order can be reversed at the next inspection and the original order will have been restored.

I prefer to use a frame lifter so I can handle each frame one-handed, and so the excited bees clamber around on the lifter rather than on my fingers. There usually is no room free of bees into which to insert the lifter, but if one end is inserted first while moving it back and forth along the top bar, the bees will back out of the way. Then you can shift your attention to the other end of the lifter while repeating the maneuver. Finally, before squeezing the lifter handles, rock the lifter back and forth crosswise to the top bars to induce the bees to get their "feet" out of the way. When replacing the frame, slide it down with its edge bars in contact with those of the adjacent frame to preclude later having to squeeze the two frames together and maybe squash bees. When you do have to move more frames together, squashing will be minimized if the Hoffman bar on one end is brought to within one bee height from its neighbor first, then the opposite end one brought into complete contact and, finally, the first. This gives bees a chance to escape while your attention is focused on the other end.

There is one step, though, in which I wonder if the bees might not prefer that I use smoke. This involves clearing them off the top edges when an upper super is set down. The trouble with bees is that when they spot a small opening which is getting smaller, instead of seeing this as an opportunity to get out of the way, they see it as a last chance to get in. I used to try setting the upper super on a little misaligned and then rotating it into place. But I seem to have better success setting one corner down and very slowly lowering the remainder. Bees do not like to have things set on their backs and will get out of the way when that happens. One can take advantage of this when trying to find out what is under a pile of bees on a frame. Gently stroking their backs the flat of a hive tool will cause them to scurry away quickly.

I think it helps, too, to be mindful of the three levels of defensiveness exhibited by bees. I especially enjoy making these distinctions with the general public when I man our club's booth at the local fair. First, I tell them, if a bee has decided that it is her duty to sting you, she does so in an instant, much too fast for you

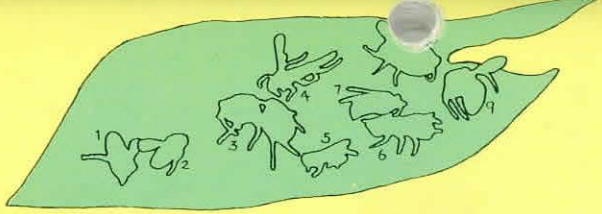
Continued on Page 436

The Gentle Art of Being Gentle

Dan Hendricks

BOTTOM BOARD

WHAT KIND OF BEE?



1. Honey Bee Worker
2. Honey Bee Worker
3. European Wasp
4. Paper Wasp
5. Yellow Jacket
6. Bald Faced Hornet
7. Bald Faced Hornet
8. Bumblebee
9. Carpenter Bee

There's All Kinds Of Bees. Most beneficial, some get in the way. Know the difference.

HONEY BEES

QUEEN. The most important honey bee in a colony. Long, slender abdomen. Lays eggs, distributes colony regulating pheromones. One per colony, lives 2-4 years.

WORKER. The most often encountered honey bee. Fuzzy. Gently collects nectar & pollen from flowers. Cares for young. Lives a single season. Defensive near colony. Caution.

DRONE. The honey bee's male. Cared for by the workers, mates with queens from other colonies. Large, stout body, with large eyes that touch at the top of head. Can't sting.

Nature doesn't waste energy. All bees and wasps have a beneficial purpose. Some, unfortunately, conflict with human's activities. Honey bees are the only bees used by man for honey, pollinating, wax and other products. And, they are the only domesticated bees.
Protect Honey Bees.

HALICTEDS. Solitary bees, smaller than honey bees, but are similar in appearance. Gentle, seldom a problem. Fuzzy. Many similar varieties. Some metalic

European Wasp. Large, very large. Reddish brown and black. Slow flying, moderatly aggressive.

BUMBLEBEES. Common, large, fuzzy and gentle. They live in small underground nests, are good pollinators, and generally avoid people. (Killion photo)

CARPENTER BEES. Similar to Bumblebees in appearnace, but dark abdomens. Live in wood, can damage structures. Gentle.

BALD FACE HORNETS. Black and white, shiny, larger than a honey bee, aggressive. Easily provoked. Multiple stings. Nasty, but beneficial. Die in winter. **BALD FACE NEST.** Large paper, aerial nest, usually in trees, rarely on buildings. Lasts only one season. Queens overwinter in protected spots. Start nest in spring. Large population by late Summer. Extreme Caution. (Killion photo.)

PAPER WASPS. Thin waisted, elongated, usually shiny black to reddish brown. One to one and a half inches long, with long legs. Nests commonly on a 'stalk,' suspended from eaves or porch ceilings. Non-aggressive, but don't push it.

YELLOW JACKET. The most common stinging insect. Bright yellow and shiny black, smaller than a honey bee. Ground nesting (lawn mower encounters can be disastrous!), and small aerial nests (trees, eaves, chimneys). Aggressive, can sting multiple times. Very easily disturbed. Extreme caution.

Photos by Ken Chamberlain except as noted.
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