

GLEANINGS IN



AUG '89

BEE CULTURE



TO KILL
A HONEY BEE



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COVER . . . Being able to quickly and safely handle unwanted honey bees is a skill every beekeeper **MUST** learn. Our cover story this month details one way to do this with a minimum of fuss — and **NO** pesticides.



AUGUST



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Controlling a potentially dangerous situation involving honey bees and people is a skill every beekeeper will need to have — especially when our industry is spotlighted with negative attention from African Honey Bee Hysteria. Our staff has explored one excellent technique. Use it.
- **MORRIS SMITH...A PROFILE***Marshall Dunham* 470
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THE INNER COVER

Bad News

A few months ago I spent some time talking about dealing with the press. Specifically, dealing with local or regional reporters, and the not-so-nice subject of African honey bees and public perception.

This subject has great potential for becoming a real trouble maker, especially when dealing with reporters who are not schooled in beekeeping. Obviously our job is to convey accurate, precise information in such a manner that they understand beekeeping, pollination and the African honey bee. But even more importantly, they must be able to relay that information to their readers so that the facts are correct and we are not misquoted. Not an easy task on either side.

Confusing the issue is the fact that there are several conflicting viewpoints floating around that make this already messy story even more complicated. It is not all black and white. But then it seldom is when economics or egos are involved.

When the information was published, I thought I had covered the subject enough for awhile. Not that we don't all need a refresher on occasion, but there are other things to spend one's time on. That is until last week.

Readers often send me newspaper clippings of events that have occurred in their area. I like this because it keeps me informed of subjects I wouldn't normally have access to, and it shows the types of things readers think are important. Both are fuel for this magazine, so keep those clippings coming.

But a piece arrived last week that did a great disservice to both sides of the beekeeping/reporting relationship, and I think you should be aware of it — because it could happen to you.

The story was about a beekeeper who has been having problems for several years. A bad storm destroyed hives and equipment, tracheal mites have decimated many of his colonies and foreign imports are stealing his markets. There's nothing new here, bad news like this has been in the papers and magazines for years. That doesn't make it any less sad, nor does it solve this, or any beekeeper's problems. The reporter got almost all of the information right, and the beekeeper seemed fairly well informed — a well balanced story.

Almost.

There was a bitterness in this beekeeper that should not have been put into print.

I quote; "... commercial packers are buying foreign honey and diluting it to half strength with corn syrup to get the light color that people think honey has to be. Then they cook the honey so it won't ferment, and sell it as pure honey."

I don't doubt for a moment that the beekeeper who said this believes it to be true. And it may be, in an isolated instance or two. But there are several reasons why this should have never seen the light of day, at least in this form.

First, this gross generalization transcends just the commercial packers. It lands, eventually, on everybody who puts the words 'Pure Honey' on their label. Readers of this newspaper article will not, and cannot know where honey comes from on most occasions. Unless they go to a beekeeper's house and buy direct, honey comes in a jar from the store. Does that mean it comes from a commercial packer? And, after reading this article, what do you suppose the first impression will be when your average consumer sees the words 'Pure Honey' on a jar of honey?

Second, the reporter who *didn't* follow up on that part of the story did his readers a great disservice. The human interest part of this was well done. But the real news was accepted as fact and then dropped. This beekeeper made claims that, if proven, could land a commercial packer in jail. Tampering with food is a no-no, and as a reader I'm interested in who is spoiling my food.

Continued on Page 476

NEXT MONTH

Next month is National Honey Month, and we've got some super articles to help celebrate Super September!

First, we're going to take an in-depth look at honey — but from the perspective of sales, the loan program, production, pricing and more — all laid out by our honey reporting regions. Find out how your state, and your region look over a three year period. We'll be using USDA, ASCS and other Federal figures, plus our own to arrive at what we feel is the most comprehensive analysis we've ever seen — right here in *Bee Culture!*

But there's more to Honey Month than facts, figures and graphs. The National Honey Board is entering their third successful year, and sends along a report on their efforts, and rewards, their plans and goals for the next few years. The National Honey Board is certainly one of the most far-sighted programs our industry has ever jumped into.

This month, we make rough wax cakes from cappings and old combs. But Next Month, we'll take those not-quite-ready cakes and turn them into candles and other products you can sell, give away, or just enjoy.

But most of us end up with far more wax than we can ever turn into candles. Besides, it's always good to turn into foundation — and we'll take a look at just how that's done. In another South East Exposure, we feature Randall's Wax Works in Umattilla Florida. From raw wax to finished foundation, they do wonders with wax. See how it's done, right here.

But there's more Next Month. Roger Morse, Steve Taber, Elbert Jaycox, Richard Taylor, News and Events — Lots to learn, lots to enjoy — all here Next Month in *Bee Culture*. □



MAILBOX

• You're Welcome

Wow! This magazine is on a roll! The June cover is another keeper, and Birds, Bees and Butterflies, organic gardens and forests, a treasury of Rare Resources, and Earth's integrity (encouraging natural resistance in bees versus insecticides) all together are, well, Wow!

And that's not even mentioning the experts, current events, and more. This much sane reading holds hope. The Earth and I thank you.

Gwen Eisenmann
Brixey, MO

• Fallow Fields

There are acres of farm land around me standing idle. This idle land is not limed or sweet enough to produce a stand of sweet clover. What other crop or plant could be seeded by disking in and not require a lot of fertility to produce a crop of honey? Buckwheat does not produce honey in this area, I tried. More information is needed on what could be grown to keep honey bees busy, especially during July and August.

George L. Fetrow
York Haven, PA

• Presidential Honey

I heard on the radio recently that President Bush is allergic to bee stings.

It might be a good idea to see that he gets a quantity of comb honey of the kind that he was used to in his youth, to guess, that would be clover. Star Thistle comb honey is supposed to be superior.

Ed Rittershausen
Polson, MT

• Cosmetic Recipes

I wonder if you or any of your readers could possibly help us.

We are trying to find recipes for cosmetics, especially one for honey soap, all based on hive products.

We have written to all the bee book sellers here in Britain but without success. Maybe you could suggest information published in America.

R. A. Stacey

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Nr. Norwich, Norfolk

• Still Helping

Following up on the Mailbox Section in the May '88 issue, "4-H: 'H' is for Help", seemed to indicate a search for 4-H Beekeeping information. Washington State University Cooperative Extension has several guides for young beekeepers and leaders.

In addition, we have many other publications which your readers may find useful. A free list of publications can be ordered by writing to:

S. J. Collman
WSU Cooperative Extension
600 128th Street, N.E.
Everett, WA 98208

Sharon J. Collman
County Extension Agent

• Making Mead

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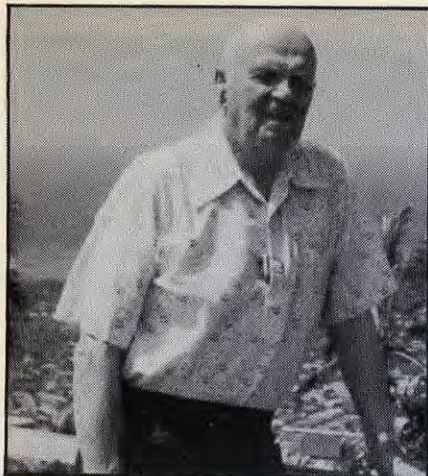
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Charlie at 93... a well deserved rest.

• Aloha, Charlie

Some months ago I offered to supply readers with information on back articles at a small cost. Going back as much as 45 years, to my surprise, I have been flooded with requests.

However, I have decided to call it quits. It has been a great pleasure to be able to work with you.

Beekeeping has been a wonderful hobby and it has enriched my life.

I am astonished at the interest shown in keeping bees, notwithstanding the high cost of equipment, the diseases and the small return on investment.

Charlie Koover
Honolulu, HI

• Adapt-a-Vac

In the June issue there is the question of bagging bees (Q & A, Catching Bees with a Shop Vac). We were called upon to remove some bees from a house porch.

The swarm was fairly new with little comb. Three times we attempted to dampen the bees and transfer them to a hive.

Not succeeding, I took my Dayton shop vac, wrapped some screen wire around the dust filter in such a manner that there was space for air to pass. I also installed a screen bottom partway up so that no bees could be sucked directly onto the filter. It worked. There were less than two dozen dead bees pushed out of the hive the next day.

Air velocities are much reduced in the collecting can. I got the idea from a previous article in *Bee Culture*.

Earnest Snavelly
Loris, SC

Reader Assistance

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AUGUST Honey Report

August 1, 1989

REPORT FEATURES

Summary: R=Range of all prices.
A=Average prices across all regions.
L=Last month's average.
Comments: Price Index is a ranking system comparing a region's prices to other regions.



	Reporting Regions								Summary		
	1	2	3	4	5	6	7	8	R	A	L
Sales of extracted, unprocessed honey to Packers, F.O.B. Producer.											
Containers Exchanged											
60 lbs. (per can) White	43.50	39.61	40.00	36.00	25.50	34.25	38.63	41.50	25.50-44.00	38.53	35.69
60 lbs. (per can) Amber	42.50	37.13	35.00	22.60	23.50	34.00	36.00	38.00	22.60-43.00	35.52	33.42
55 gal. drum/lb. White	.47	.31	.40	.40	.40	.60	.57	.62	.31-.65	.50	.50
55 gal. drum/lb. Amber	.44	.30	.34	.36	.35	.57	.53	.44	.30-.58	.44	.45
Case lots — Wholesale											
1 lb. jar (case of 24)	28.55	27.46	26.10	26.60	23.50	23.88	26.25	30.38	22.80-35.00	27.14	26.78
2 lb. jar (case of 12)	27.15	26.70	25.50	24.60	22.20	23.25	28.25	28.50	21.00-31.00	25.97	25.48
5 lb. jar (case of 6)	30.38	26.37	24.00	27.00	25.50	26.00	26.15	25.80	24.00-30.75	26.70	27.30
Retail Honey Prices											
1/2 lb.	.95	1.00	.89	.80	.83	.85	.95	.89	.80-1.19	.92	.93
12 oz. Squeeze Bottle	1.50	1.43	1.49	1.19	1.13	1.09	1.15	1.36	.99-1.79	1.33	1.33
1 lb.	1.55	1.61	1.60	1.45	1.29	1.47	1.65	1.51	1.25-1.99	1.54	1.52
2 lb.	2.83	2.93	2.25	2.55	2.29	2.41	2.90	2.68	2.25-3.89	2.72	2.69
2-1/2 lb.	3.35	3.84	1.45	3.29	3.25	3.07	3.71	—	1.45-4.85	3.32	3.42
3 lb.	4.10	4.10	3.50	3.19	3.59	3.70	3.62	3.65	3.19-4.20	3.77	3.81
4 lb.	5.00	4.83	3.99	—	4.79	4.44	4.68	—	3.99-5.00	4.63	4.71
5 lb.	6.50	5.63	5.75	5.39	5.00	5.30	6.27	6.28	5.25-7.00	5.87	5.95
1 lb. Creamed	2.00	1.20	1.50	1.50	1.55	1.55	1.75	1.71	1.20-2.00	1.66	1.67
1 lb. Comb	2.37	1.76	2.00	2.00	2.98	1.92	2.77	3.38	1.55-4.50	2.34	2.55
Round Plastic Comb	2.00	2.45	2.00	1.75	1.50	1.75	1.85	1.85	1.50-2.45	1.91	1.91
Beeswax (Light)	1.08	1.08	1.00	.95	.95	.90	.95	.95	.89-1.25	.99	1.09
Beeswax (Dark)	.95	.97	.95	.75	.90	.81	.85	.87	.75-1.10	.89	.89
Pollination (Avg/Col)	30.00	20.00	21.00	25.00	—	20.00	27.00	27.00	20.00-30.00	25.00	26.00

MARKET SHARE

Wet weather will probably reduce honey production, requiring increased fall feeding. Watch costs — they will probably be higher due to increased demand for HFCS and reduced corn crops two years running. Sugar, too, may be higher, as suppliers rush to sell high before congress tampers with imports in the next farm bill.

Amber honey will be in good supply but light and specialty crops will be lower this year though prices won't reflect supply. □

Region 1

Price Index 1.00. Sales steady but prices increasing just a bit with higher prices promised in the future. Excessive rain has limited field work and flight days and allowed swarming to continue unabated. Reduced crops will result.

Region 2

Price Index .92. Sales steady to increasing and prices definitely up. Specialty crops just beginning to hit the market with corresponding jump in some sizes. Wet weather has stopped some crops but needed moisture will aid fall flows.

Region 3

Price Index .87. Prices increasing, sales steady. Specialty crop production reduced this year, especially citrus, so prices will be higher. Wet weather has hurt some areas, but others were dry so it was welcome.

Region 4

Price Index .78. Prices and sales steady but neither are terrific. Eastern areas of region having too much rain while western areas too little. Both are limiting production and may even affect wintering. Dry areas in worst shape, though.

Region 5

Price Index .73. Prices increasing to steady but sales only steady to slow. Weather tending to cool and dry, but adequate rain for good flows. Pasture is the problem with large acreages of good foraging lacking. Western part of region more optimistic, especially after last year.

Region 6

Price Index .83. Prices and sales steady. Most areas average to high rainfall, reducing foraging days especially in eastern areas. Central and west areas looking for good crop.

Region 7

Price Index .92. Prices steady to increasing a bit, sales holding strong with outlook even better. Moisture playing havoc — either too much or too little — but some areas doing well. Dry areas looking for rain, wet for some sun.

Region 8

Price Index .88. Prices down and sales steady. Northern areas reporting adequate moisture and warm temperatures, a real treat. But southern parts of the region tend towards dry, dry, dry. Orange honey crop poor, sage down, too. Cotton will be critical.

Interested in becoming a "Honey Reporter"? Contact the Editor today!

Book Reviews...

Old Favorite Honey Recipes and Honey Recipes. (2 books in one)
American Honey Institute and Iowa Honey Producers.
 Meyersbooks, Glenwood, IL 60425

Having both of these books in their original form, I was delighted to see them published in the combined format. The **Old Favorites** is well-written with good, though dated, information. I think the publisher did a slight disservice by not adding updated information — even as an addendum.

Nevertheless, the recipes are quite good and are in an easy to read format, which covers beverages, breads, candies, confections, meats, vegetables, salads and sandwiches. They even have a simple honey marshmallow recipe, using gelatin, water, honey and coconut. It sounds so simple! And a few easy-sounding angel food cakes, too. The best one is the refrigerator rolls, using mashed potatoes.

The second book, **Honey Recipes**, is shorter but filled with scrumptious honey salad dressings (pink shrimp orange salad is quite good) as well as the other cookies and breads. A good complement to the **Old Favorites**.

— Diana Sammataro

Beekeeping — A Complete Owner's Manual
Werner Melzer, Barron's, NY, 1989

This attractive little book, translated from German, has limited use here but does have beautiful photos and excellent line drawings.

The seven chapters contain useful information about the inside of a bee hive and the occupants. However, in discussing types of bee hives, the author assumes 'leaf hives' are available in this country — which is more an editorial error than author's problem. But an even greater omission is that package bees are not even discussed.

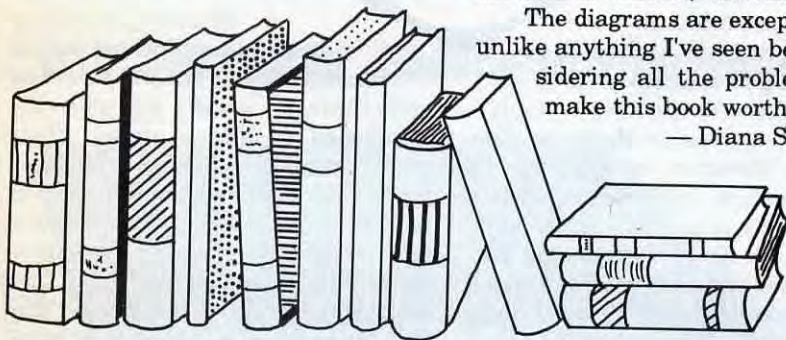
Similarly, it is suggested that frames should be wired vertically, a practice not common here, nor are pipe smokers commonly used.

But the sections on management seems appropriate no matter where you are. So, too, is the Beekeeper's Year Cycle and accompanying chart. Both are easy to use.

However, a gross editorial error that must be mentioned are the proposed treatments for varroa mite. Many chemicals are listed, but none are approved for use in the U.S. on bees. Also, the list of references in the back of the book are dated (most recent, 1978).

The diagrams are exceptional and unlike anything I've seen before. Considering all the problems, these make this book worth having.

— Diana Sammataro



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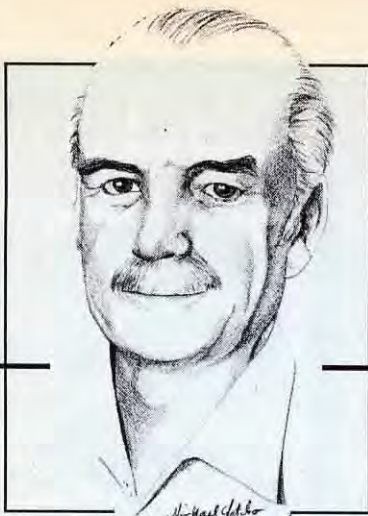


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THE BEE SPECIALIST

ELBERT R. JAYCOX

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"Can we blame ALL these winter losses on mites, or is something else going on?"

If you would like to help some worthy people deeply interested in honey bees, consider purchasing a new magazine in a language you may not be able to read — Spanish. The magazine is *Apicultura Moderna*, or Modern Beekeeping, produced by a group of Mexican university students and friends in Guadalajara, Jal., Mexico. They call themselves the beekeeping investigation institute of Mexico, and they hope to improve beekeeping in their country. By supporting the magazine you will also help support graduate studies in apiculture.

The magazine is notable both for its appearance and the diversity of its content. The first issue for May, 1989, has a striking cover with color photos from a study by Francisco J. Trujillo Flores of the collection and storage of fungal spores by honey bees. The fungus infects the cones of pine trees in the

area of Jalisco state called Sierra del Tigre.

Within the attractive cream-colored pages of the magazine you will find articles about the nutritional value of honey, the storage of queen bees, an interview about African bees, the 2nd American beekeeping seminar in Oaxaca, and the need for more beekeeping research in Mexico.

There is also a gastronomic section and a page with an appealing bee cartoon for children to color.

The magazine will appear three times a year — January, May and September. Individual copies are 3,500 pesos, or about \$1.50 at present exchange rates. No price is given in the magazine for a yearly subscription, either for Mexico or other countries. However, considering the cost of mailing publications, \$10US may be a fair price and I am sending that amount. The magazine will also consider the publication of submitted manuscripts on beekeeping, ecology, and nature. Those received in English will be translated into Spanish if accepted. Manuscripts should be type-written on letter-size paper. For style, follow that used in the magazine. The address for subscriptions and correspondence is:

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36) 217232, 212566, afternoons.

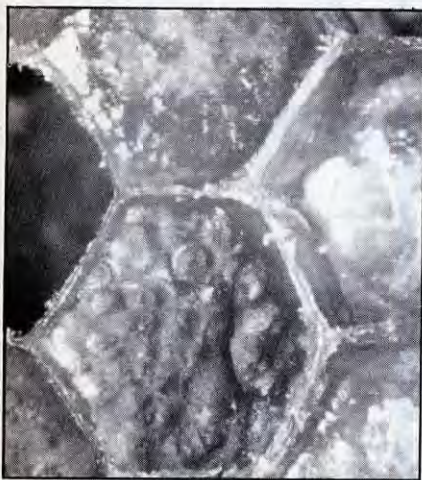
More and more we are seeing references and suggestions that the nutrition of bees in many parts of the country is not all that it should be. In areas as widely separated as California and Florida, the weakening and deaths of many colonies appear not to be the result of diseases and pests, but the lack of dietary protein. This

protein is necessary to develop the bees' body reserves and to help produce several generations of young bees needed to carry colonies through the winter or off-season.

Of course, this diagnosis is complicated by the

known infestations of the tracheal mite (*Acarapis woodi*), now generally distributed in many states. Many people in beekeeping are convinced that winter losses, whether in cold or mild climates, are the direct result of mite infestations and they are emphasizing mite control as a solution. Others, whose opinions I respect, say that these losses have been with us for many years, long before the tracheal mite invasion and the problem results from lack of protein at the important time of year when colonies are preparing for winter. At that time, the bees must increase their body reserves and young bees with good reserves must be produced in the fall to carry the colony until new generations are reared the following year.

We have seen disappearing disease, desert disease, spring dwindling and many other unnamed cases in which colonies were seriously weak-



These cells are full of freshly tamped pollen added by the beekeeper. If you look closely, you'll notice the marks left by the bees' mandibles when they finished.



This frame has NO stored pollen surrounding the brood. Workers must transport pollen from other areas in the hive when this happens, slowing the feeding schedule. Also, there won't be food readily available when (and if) these larvae eventually emerge.

ened or lost from causes not well documented. Dr. C. L. Farrar of the U. S. Department of Agriculture, blamed all such cases on infection with nosema disease (*Nosema apis*). More recent studies have not confirmed this relationship. Instead, Dr. Christine Peng, University of California, Davis, has demonstrated that the colonies are

suffering from too little pollen as they go into the fall and winter period. Feeding supplemental protein helps to offset such losses. Such feeding may also allow us to separate any losses due to infestations by tracheal mites and those from other causes; protein feeding, without other treatments, may aid in offsetting the effects of mites on colonies. Dr. Malcolm Sanford is investigating the problem in Florida.

Extensive beekeepers may find it too expensive in time and money to feed protein supplements in the fall, but it could be fun as well as revealing for beekeepers with only a few colonies to experiment along these lines. One of the best ways would be to start now to provide half your colonies with extra frames of pollen as they prepare for winter. The other half can be left as a check to compare the two groups.

To prepare frames of pollen you need a pollen trap or two and some empty combs. As you empty the pollen trap every day or two, pour the fresh pollen into one side of an empty comb, spreading it into the cells and settling it by tapping the end bar vigorously with a hive tool. Tip the comb slightly so as not to spill the loose pellets and put it into a strong colony. The bees will tamp

the pollen in place as if they had collected it themselves. You can complete the one side by adding more pollen and then fill the other side in the same way. Prepare as many combs as you think necessary to help the bees rear fall brood and for the young bees to fill up on.

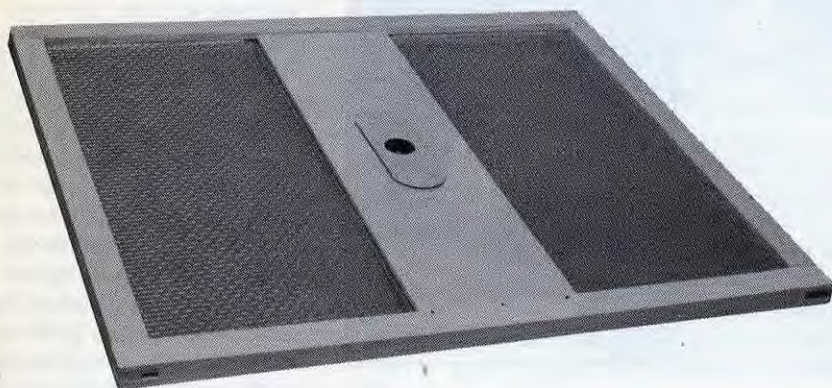
If you find that your test colonies have little or no pollen around the brood you should pour pollen also into the empty cells in those areas. These are the locations where newly-emerging bees first feed on pollen, only an hour or two after coming out of their cells.

To make your experiment more valuable, you should send samples of adult bees to the Beneficial Insects Laboratory, U. S. Department of Agriculture, Beltsville, MD, in the fall and again in the spring to learn what percentage are infested, if any, with tracheal mites. Your state may also have a testing lab, and if so, try there, too, instead of the USDA facility.

There was an interesting note about supering bees in the newsletter, *An Hes*, of the West Cornwall Beekeepers, UK. Raymond Ripley recommended *top* supering because if you put the empty new super below the full one, the bees will put honey into the brood chamber. He cites the case of a beekeeper friend who had an accurate scale on which he weighed his supers every week. When he put his empty super beneath a full one, he found that a week later the formerly full one was ten pounds lighter.

This time of year, or at least as the weather cools, you may want to add some supplemental heat to your combs before extracting them. Ron Brown, English beekeeper and author, suggests stacking eight supers at right angles to one another and covering the top with an inner cover and a couple of old blankets. Beneath the pile, center a 60-watt light bulb in such a way to keep it from contact with anything flammable. Above the bulb, put some thin metal or aluminum foil to prevent a hot spot on the combs above. After 48 hours of such warming, the combs will extract readily and more completely than if they are too cool. □

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Bits, Bytes and Honey Bees

DAVID SMILEY

Did you ever want a friend to know just how great your home-grown queens are? Or, that adding a new piece of equipment helps (or hinders) colony production. Good records are the only way to prove these things, and one great way to keep records is on your computer.

But these microchip marvels can do so much more for your business, or even your hobby. Keeping customer lists, invoicing, balancing checkbooks, tax records — the list is only limited by your imagination, and how deep you can dig into your bank account — a fact your computer could tell you to 10 decimal places, if you asked.

Once you decide that a computer is for you, the first thing you've got to consider is what software do you need? Software is the set of instructions that controls a computer's activities. Since there are many types available you'll have to decide which is most appropriate for your business or application. But to make a good decision you need to first list all of the things you want the system to be able to do for you. This will organize your thoughts and prioritize the activities you want to automate. Then you will be prepared to talk to the software vendors.

Pre-Packaged Software

Ready-made commercial software is available at local computer stores or through catalogs or magazine ads. These range from spreadsheets (like

Lotus 123* or Excel*) to databases (like dBase III*) which allow you to build your own program — within certain limitations, of course. Off-the-shelf programs can be extremely flexible and will meet a variety of requirements. However, keep in mind that the more flexible a program is, the more work you will have to do to specify what you want from it. Depending on the package you choose you may end up learning far more programming than you wanted to — right from the start!

On the other hand, some commercial software is very specific. The programs are tailored to a single minded



purpose, such as comparing weather and colony performance. Normally, all that's required with this software is to enter your data. All of the computations, ordering and analysis are already built into the software by the person who developed it. These programs are fairly rigid and you won't be able to make many modifications. If the pro-

gram's designer didn't feel that information regarding the breed of your queen was important, you probably won't be able to track it. Once you take these limitations into consideration, remember that these programs are usually very efficient and complete in handling the problems that they were designed to solve.

Of course, nothing is perfect, and you probably won't find a commercially available program that meets the exact need you have in mind. Frequently, though, you might find one that comes close enough to be useful. The problem here is evaluating how close they really come. In most large cities there is enough competition between computer outlets that you can ask to try out a package and see how well it works. But even so, you'll only have about an hour to read the manual and to run some data through the program. Go prepared. Have sample information and data and see how easy it is to enter and to correct. Use all (or as many as possible) of the functions of the system — data entry, sorting, updating, correction, computations, graphing and printer controls. Absolutely

make sure that you run all of the reports. After all, the only reason to put information in is to get it back out, preferably in a format that is easy to read and, more importantly, easy to use. If any of these trials gives you a serious problem that can't be corrected, try another program.

But most of us don't have the lux-

Speak the Language

Hardware

This refers most often to the computer itself and usually includes the screen, printer, and any disk drives.

Software

This is the set of instructions the computer needs in order to know what to do next. There are two types:

- **Operating System** The instructions the computer needs in background operations (how does it send information to the screen, to the printer, how to write or read a disk, etc.).

- **Application** This is what you normally think of when you buy a program. It's a set of instructions to perform a job, be it a game or your budget (a less interesting game).

CPU

Central Processor Unit. The real name for the internals of the computer without the data drives or screen. It consists of the memory, input/output interfaces, and the logic chips.

Monitor

Another name for the screen.

Hard Disk

A high capacity storage unit for saving your data and files. Programs run faster from a hard disk, they are more reliable than floppies, and YOU SHOULD HAVE ONE!

Floppy Disk

The disks are used to exchange data with other computers and are how you read programs to store on your hard disk. There are 3.5 inch disks that store 720,000 characters or 1.4 million characters. The 5-1/4 inch disks store 360,000 characters or 1.2 million characters. The 5-1/4 is the most standard right now, depending on the computer. It takes special drives to read the higher capacity

(high density, quad density) disks.

Firmie

A name for the 3.5 inch floppy disks since they have a 'firm' plastic shell.

Spreadsheet

A generic name for the class of programs that emulate an accountants spreadsheet. You enter data and math formulas and the program does the computation. The nice thing about the spreadsheet program is if you change a value, it does all of the re-calculation for you with no erasing! Probably one of the most useful small business programs.

Data Bases

The term database means several things. A data base is simply a collection of data like your yield statistics. Application program databases are programs that store and retrieve your data quickly and in an organized fashion. They are very useful for large collections of information. They tend to be relatively expensive.

•Relational

A relational database stores its data organized by indexes. It "relates" pieces of information by use of the index. Fast and sophisticated.

•Hierarchial

A database that stores things in a set order by keys. A very usable system although it cannot handle as complex data relationships as a relational database and can't be restructured as easily if you change your mind.

GIGO

An old programmers term — garbage in, garbage out. Your results, regardless of the package you use, will be no better than the accuracy of your inputs. If you tell me to expect an 800 pound yield per hive, don't blame me if the projection that says you're a millionaire is wrong.

ury of trying lots of programs and running various reports. Most likely, if your town does have a computer outlet it will have a limited supply of software available to choose from. So, before you buy, try and get all of the information you can. Write the company selling the software to see what they can tell you. Usually they're fairly generous with information but not always. Ask for names of customers and contact those people to see what problems they encountered and if their needs are similar to yours. If possible, buy just the user's manual and read that before you make up your mind. If you belong to a trade group, see if they have any suggestions. Try local book stores, the library, friends, relatives—you're making a big investment here and you don't want to blow it.

Home-Made Software

For those who want something special, something that fits your needs like a good bee glove, you'll need to hire someone to write a program tailored to your exact situation. This is usually expensive, though, because you're paying someone to learn about your business and how you want to use the data you have. In this situation it especially helps to clearly and concisely specify your needs. The time spent making sure that the developer understands what you want is the most important part of the process. A good developer will meet with you several times, depending on the size of the project. The design effort itself can take a third of the time allotted. Figure another third for coding (writing the actual program) and the final third is for testing.

A difficult part of this though is that you'll have to evaluate the ability of the person who is doing the work before you start. Make sure you have a contract and make sure you check the person's references. There is nothing worse than paying several hundred (or thousand) dollars, only to end up with a program that is off the mark or so full of bugs that you can't trust the results. Finally, don't fail to specify the delivery dates in the contract. In fact, it may be best to specify several dates in the contract — one for the first third, second third and project completion.

Never fear, though, there are lots of other ways to get custom software. To start with, you can write it yourself. But unless you have programmed before, and enjoyed it, I'd suggest you not take

Continued on Next Page

this approach. It's not uncommon for a small to moderately-sized program to take several hundred hours to design, write, and de-bug. Those are hours that you'll be spending away from your primary responsibility — running your business. Writing your own programs can cost you a lot more than time, though. There is what I call a frustration cost. You'll be frustrated by your lack of knowledge, frustrated by the exact discipline required to make the program language you are using work correctly, and frustrated even more when hunting the errors that always occur. In addition, since you'll inevitably think of things you'd like to add as you go along, you'll probably have to scrap your first program at least once to incorporate that new idea.

Don't get me wrong here. I still think it's a good idea to learn programming but don't start with a huge project that needs to be done yesterday. Rather, start small and work at building progressively more complex programs. If you enjoy it, then in time you'll feel confident about handling a major effort.

There is still another way to get to where you want that might not be immediately apparent. Community colleges usually have data processing classes. Although the students aren't experts, they do come from your area and may even have a bit of understanding about what you need. This will greatly decrease the learning time, but best of all, they are *always* enthusiastic!

To try this, approach the instructor and ask if he can suggest students capable of tackling the project you have in mind. If your project is reasonable he may be willing to assign it to them as extra credit. This pays big dividends for you because then he will help translate your requirements to the students, supervise their work, and assist with the testing. And, of course, most students are excited about an opportunity to do "real work". I've had students work on projects for a small flat fee which gave them the chance to claim they had programming experience when looking for their first job. Even better, I've had them work free just for the opportunity to have their name on the software!

We all have egos, don't we?

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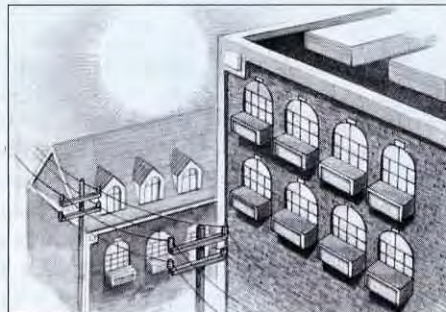
Computer Hook-Up Do's and Don'ts



Lightning can send a sudden electrical surge through power lines into your machine. Loss of data is the least of your problems. A fried machine is the worst. Surge protectors help, unplugging during a storm is best.



Old wiring may result in low voltage problems and cause a noisy ground. Reduce load stress and don't ever have four plugs in an outlet. Best — a direct line from your breaker box to your machine.



Brown-outs, or voltage pruning by utility companies, can cause data 'rearrangement' and other problems, including serious disk drive malfunctions. Big city utilities are worst, but rural companies suffer the same problems.



In house contamination, that is sharing an electrical line with other users, can cause memory problems, screen distortion, and garbled messages.

Drawings © On Dec.

And finally . . .

Be certain the software you have developed is able to run on your system. If it is developed in a specific language or package you may have to buy that package in order to run it. This can be a significant, and unplanned, last minute expense. The best approach is to have the work performed on a system just like the one you own. And, with luck, you already own a 'standard' system like a MacIntosh™ or an IBM 'clone'. However, if you bought Fred's Computer and No-Name Operating System, you may never be able to get anyone to write anything for it!

Regardless of how you go about getting the software you want, don't be in a hurry. Take time to research what is available. Take time to talk to people with the right experience and be clear about your needs. And make sure you differentiate between a NEED and a 'nice to have'. The time invested up front in finding the right package or in working with the developer to build your system will pay ten-fold dividends in making your job easier for a long time. □

David Smiley is a manager of data processing for US Sprint. He also works with small businesses, assisting with development or adaptation of in-house automated systems. In his spare time he applies these organizational and computer skills to his colonies in the backyard.

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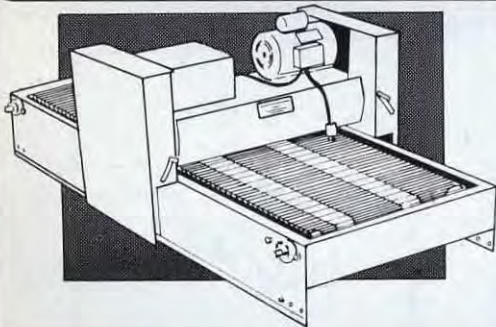
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Joe Valas, Lindsay, Ontario, Canada

Probably the best known cactus in the United States is the saguaro, the tall plant with "arms", which caused my kids to call it a "dancing" cactus. It is found primarily in Arizona and is not present in New Mexico or Texas, yet you frequently see the image of a saguaro wherever someone wants to give the idea of "desert". I'm taking similar liberties by calling the states of Arizona and New Mexico "Cactus Country" and leaving out other places, but I'd like to give you an idea of the varied styles and beekeeping practices we have in this part of the country.

The two states are quite different in elevation and climate, with Arizona much the warmer. Most of New Mexico is above 3,000 feet in elevation, with the lowest point at the southeast corner of the state. Arizona, however, has extensive areas where the elevation is below 1,000 feet and with warmer temperatures to match. You can see the difference between the two states clearly on maps predicting the areas of adaptation of African bees — most of New Mexico is predicted to be unfavorable to them, where as there is a rather large favorable area in southwest Arizona.

Arizona has two rainy seasons, winter and summer; New Mexico's major rainy period occurs in July and August. The rains, if they are timely and sufficient, bring vast acreages of annual and perennial wild flowers and shrubs into bloom. But if the rains don't fall, or fall at the wrong time, beekeeping is confined to irrigated areas and cultivated crops for its supply of nectar and pollen. Arizona has larger acreages of irrigated plants, as well as a greater diversity of wild and cultivated nectar and pollen plants than New Mexico, so is able to support more honey bees. Citrus, palo verde, jojoba, eucalyptus, and many other plants are important to bees in Arizona but do not occur or are very rare in New Mexico. This is primarily due to the low winter temperatures in much of New Mexico. I have seen it drop to 1°F in Las Cruces in the winter and have pulled out many perennial plants that were *supposed* to be hardy here but which died from the cold.

Northeastern Arizona and much of northern New Mexico has a colder, more continental climate than areas farther south. There are pine forests in Arizona, and sweetclover and alfalfa are common in New Mexico. Summer high temperatures are relatively mild there.



ACTUS OUNTRY

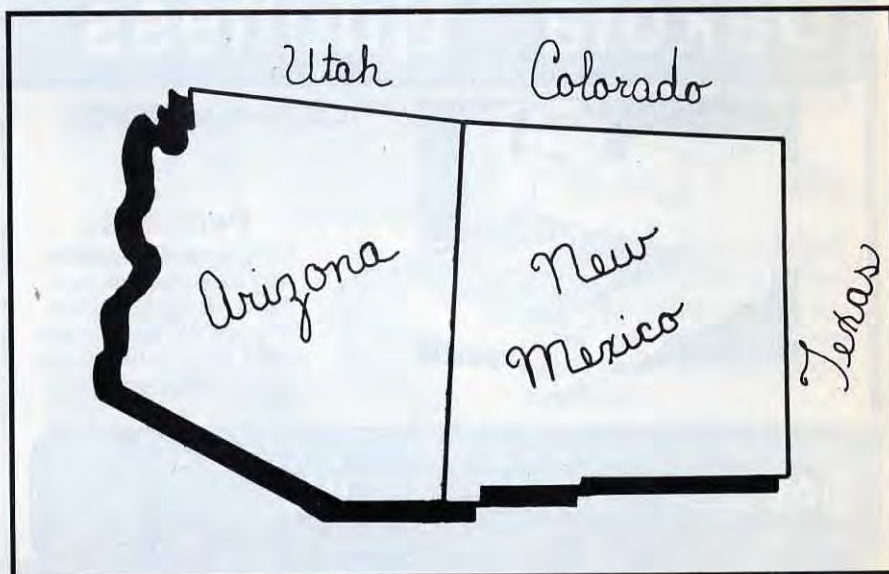
BEEKEEPING

ELBERT R. JAYCOX

Beekeeping equipment in these states is generally adapted for ease of migration with migratory or flush lids (not telescoping) and 2- or 4-cleat bottoms. Extractors are tangential, not the radials of the east and north, because low humidity contributes to honey moisture levels as low as 12 to 14%. Many beekeepers who used to struggle with full-depth hive bodies now use lots of 6-5/8" boxes. They have

found that using all-deep equipment is not as efficient as it is reputed to be, especially as they grow older.

Field work begins early in the year in Arizona, somewhat later in New Mexico. Arizona beekeepers who take their bees to California for almond pollination (about 15,000 colonies go each year) may begin preparing their bees by December 15, and most colonies are being checked by January 15. With



higher elevations and cooler climates, New Mexico beekeepers begin their spring chores in February and March. Colonies needing feed can be given stored combs of honey in February; these are easily stored in a dry climate: there is very little moisture for the honey to absorb, so it doesn't ferment in the comb. More extensive work does not get started until March.

As easy as mid-January, the earliest sources of nectar and pollen become available at the lower elevations of southern Arizona. Mustards and a few other desert plants stimulate the colonies and may even give a light flow in February when filaree and fairy duster are in bloom. The earliest "commercial" flow is from citrus though, which starts in the Yuma area as early as mid-February and in areas near Phoenix by early March.

The desert provides a second honey crop in Arizona during April and May, and the first one in New Mexico usually begins during the month of May. The mustards found around alfalfa fields provide some stimulation before that time in New Mexico, but they can also be a death trap when the insecticide Furadan is applied to the fields to control alfalfa weevil. In northeastern New Mexico, sweetclovers provide the early crop, followed closely by alfalfa. New Mexico beekeepers move their bees a little within the state to take advantage of the various nectar flows or pollination, but not to the degree found in

Cactus country colonies typically have migratory (non-telescoping) covers and 2 or 4 cleat bottoms. This desert apiary is near Las Cruces, NM.



Arizona. There, bees may be moved north from Phoenix to the Verde Valley or to the Black Canyon area after citrus. They may also move in July to get filled up on sunflowers near Flagstaff. In both states there is commonly a June dearth, or lack of nectar. It is pronounced in southern New Mexico, between the mesquite and cotton flows. In central New Mexico along the Rio Grande River, beekeepers harvest substantial quantities of honey from saltcedar/tamarisk. This is a dark honey, with a strong flavor and an aftertaste to match. It is sold to the bakery trade or for export to countries with a taste for strong-flavored honey.

The primary honeys produced in Arizona include mesquite, catclaw, cotton, citrus, saltcedar/tamarisk, palo verde and alfalfa. In New Mexico the honeys are cotton, mesquite, alfalfa, sweetclover, saltcedar/tamarisk and "sage" (*Dalea scoparia* or broom dalea). A 19% increase in Pima cotton acreage in 1989 will be welcome to beekeepers because it produces more nectar than the upland cotton varieties. Many other plants in both states may provide significant quantities of nectar as well, provided conditions are right.

Water, both too much and too little, is always a problem in desert areas. Few beekeepers provide it to their bees except in an emergency, but they select apiary locations where the bees can get water from rivers and streams, lakes, cattle tanks and watering holes, and irrigation canals and ditches. Apiaries in low areas or in dry stream beds (arroyos) can be washed away by the water from heavy thunderstorms.

Continued on Next Page

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Trio of major and minor desert nectar and pollen plants: mesquite at rear, prickly-pear cactus (*Opuntia* sp.) and creosote bush (*Larrea* sp.).

These may bring several inches of rain at once, nearly all of which runs off the dry desert soils. In New Mexico, bees have also been submerged when reservoirs rose suddenly from heavy rains or spring runoff from the mountains.

Shade for colonies is essential in the hottest areas to reduce the amount of the bees' labor and water required to cool the hives. Trees, including mesquite and palo verde can help but in many areas there are none. Shade structures, called ramadas, are common in Arizona. They are rarely, if ever, seen in New Mexico where temperatures are cooler, without the extended periods above 100°F in the summer as in Arizona.

Pollination of seed and fruit crops is not as extensive and important as in the past in New Mexico. Melons and seed alfalfa used to require many colonies, as well as additional ones for onion seed production in southern New Mexico. Some apple pollination continues, with a few colonies for other crops and for research plots. Far more bees are used for pollination in Arizona, however. Vegetable seed production, including radish, broccoli, and onion, requires bees, as do large acreages of watermelons and cantaloupes. More and more apples, especially in the Willcox area, also need bees in the spring.

Wintering bees in the southern portions of both states is far different from most of the rest of the country as well as from the states' northern sections. In the warmest areas of Arizona

the bees have only a 60-day winter, from about November 15 to January 15. They may use more honey than bees in colder climates because of their activity, but they may also collect nectar and pollen from eucalyptus, mustard, and other plants during this time. There is less winter foraging activity in New Mexico, however, and winter for bees in Las Cruces is about four months long, October to February. Beekeepers tend to leave most of their equipment on the hives to reduce problems from wax moth. Hives are often 3- and even 4-story over winter. There is some feeding with sugar, honey, and antibiotics, but nothing to compare with that of the colder areas of the United States.

Tracheal mites are found in the major beekeeping areas of Arizona yet the Department of Agriculture closes its eyes to all but the southeast section of the state where they have been maintaining a restrictive quarantine to

"prevent" the spread of the mites. The mites were found in four counties in New Mexico in 1988, but their present status is not known because of lack of surveys yet this year. *Varroa* mites have not been found in either state up to June of this year. Bees taken from Arizona to California for pollination could possibly return with *Varroa* mites acquired in the crowded confines of almond orchard, a common occurrence in the last couple of years.

One oddity about regulatory activities in the two states is the difference in the numbers of swarms caught in "official" swarm traps. These have been put out in an attempt to monitor bee movements pre- and post-African bees. In Arizona, swarms are found regularly and in large numbers in the swarm traps placed by the Department of Agriculture along the southern borders. Nothing but frustration for the swarm trappers in New Mexico though — very few have been collected. The difference probably reflects the greater number of colonies, both managed and wild, in southern Arizona than in southern New Mexico and the more favorable conditions, temperatures and food sources in that state. □

Thanks to Dr. Gordon Waller, Brett Cameron, and J. K. Clayshulte for their help in preparing this article. For additional reference, Gleanings has previously published an article on beekeeping in Arizona by Waller and Schmalzel in May, 1976, and one on New Mexico beekeeping by Rick Cole in January, 1982. Neither state has a beekeeping handbook available.

WEAVER'S FAMOUS QUEENS

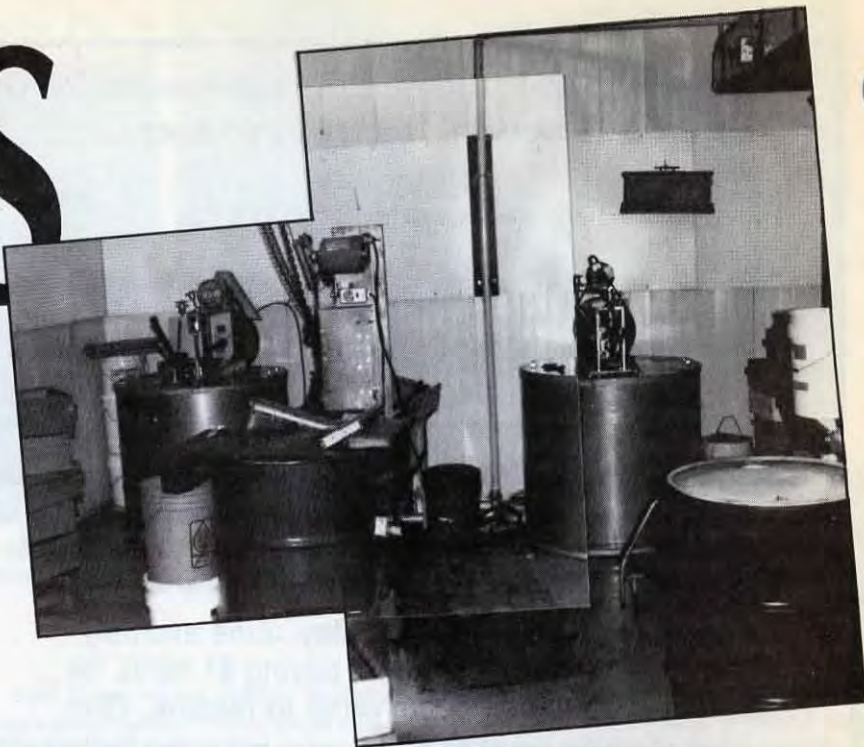
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From Frame to Finish

"Now the real work begins", says Tom Tonn, as we unload super after super in the storage room of his honey house complex. Already over two thirds



A partial view of the stacks of supers waiting to be extracted. Tom Tonn makes almost all of his equipment and fits his supers with an additional hand hold strip. "Life's too short to worry about dropping a honey super because of those tiny hand holds," says Tom, who has trouble with the size of commercially made holds.

full, and stacked nearly to the ceiling, the room has the overpowering aroma of fresh honey.

The storage room is only part of the honey house complex Tom has built over the years. It consists of the extraction room, the storage area where we unload supers, a warming room for liquifying drums of honey, and another, unheated storage area for drums, supers and other equipment. The unheated storage room was only recently completed and adds the finishing touch to what appears to be an inconspicuous garage and workshop behind the Tonn's residence.

Behind the complex Tom has stacked a few supers and drums, but since the addition of the new room most of these are now kept inside. He also keeps his king-size solar melter out back, along with a small garden and a couple of colonies.

"We have fairly close neighbors," says Tom, "and we work hard to keep our operation low key. Lots of colonies, robbing bees or a messy appearance detract from a professional image, and we consider ourselves professionals," he adds.

But the nerve center of the complex is the extraction room. Everything is set up for efficient movement of full

supers into the room, and empty supers, drums and wax out. Tom's mechanical skills are evident in nearly



Tom uses a modified two-wheel hand cart to move supers into and out of the extraction room. But this cart, with a sheet of plywood added to increase its holding capacity also works well when loading or unloading his trailer, or moving cases of bottles or other items around the warehouse. "I'd much rather make one trip than two," says Tom, "and with a good cart the work is actually pretty easy."



After dumping a super out, Dorothy examines every frame before uncapping. This is the last step in our raw product quality control, says Dorothy, and we can't afford to be careless now.

everything you see here.

"Experience, trial and error, and sometimes even luck have helped us along the way," says Dorothy Tonn. "We've designed the room to make it work for us. It fits our style, our equipment, our limitations and our assets," she adds.

Dorothy is an integral part of all aspects of this business, and in the extraction room she is "chief uncapper", she says.



A close-up of how cappings are handled. When a frame is uncapped, the cappings fall below, into a super with a screened bottom.



Some frames need a scratcher to get at the cappings. "This slows the process a bit," says Tom, "but it makes sure we get all the honey, the machine doesn't work as hard, and we don't bust as many combs."

Extraction usually starts when the storage area is full, or a particular floral source has been harvested.

Last year was "ideal" for locust, says Tom, and we were able to harvest several nearly pure barrels by pulling supers at the right time.

Supers are moved into the extraction room on a modified two wheeler that holds 11 or 12 supers at a time. They are emptied by simply turning the super upside down and dumping the frames out on the table. Dorothy quickly checks each one, looking for uncapped or empty frames that somehow got through the field inspection.

"We're pretty careful when taking



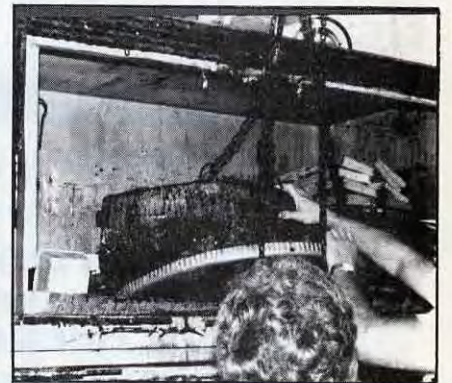
When full, the super is hoisted out of the table.



Dorothy is the self-proclaimed "chief uncapper", and enjoys this part of the job. When a frame is uncapped, it is placed in the home-made frame holder at an angle for further cleaning. The Tonn's mounted their electric uncapping knife vertically because it works well that way in their operation, which still tends to be labor intensive. "Spending thousands of dollars for something that only gets used a couple hundred hours a year goes against my grain," says Tom. "I'd rather put that money in marketing, or my kids' college fund," he states.

supers off," she says, "but you always miss a few, and this is the final quality control check. Green honey, brood or other problems in a frame will detract from the final product," she adds. This check is the difference between a "good product and an average product", she says.

Then, frames with sunken cells



It is then placed in a cabinet heater, which slowly warms the honey/wax mixture. The honey gradually runs out and is captured below. The wax is later melted in the solar wax melter.



When two or three supers worth of frames are uncapped, they are shoved together and the tops are cleaned using a hive tool.

and those that don't extend beyond the edge of the frame are opened with a cappings scratcher. The rest are run through the vertically mounted electric uncapper. Once uncapped, frames are set in Tom's frame holder.

This is a unique device, designed so the frames sit at an angle. This facilitates cleaning the topbars of burr comb, escaped capping wax, propolis or any other material. This extraneous "stuff" is scraped off and falls into an eaves trough fastened to the lower edge of the frame holder. The material is later rendered for the wax.

When the frame holder is full Tom begins filling one of the two Kelley extractors he owns. Identical, one was purchased new, the other used. They hold 33 deep or 55 of Tom's Illinois depth frames. By the time he has one extractor filled and running, Dorothy

has nearly enough frames ready for the other extractor. This way there isn't the lull while a single extractor is operating.

"Running two machines this way really keeps you hopping," says Tom, "but I'd hate the hurry-up-and-wait even more I think."

From either extractor the honey runs into a baffled sump in the floor. This clarifies the honey by separating out most of the small wax particles removed in the spinning process. From the sump the now cleaner honey is



Uncapped and cleaned frames are put in the extractor that isn't running. "You can't believe how much cleaner our honey is because we uncap well, and then remove all the stuff off the top," says Dorothy. The Tonn's have two extractors, which they operate in rotation. Identical, they each hold 55 Illinois depth frames, have variable speed control and do everything we need. "Having two machines is good because there's no lag, and if one's down, you're not out of business until it gets fixed," says Tom.



The scrapings fall into an eaves trough at the edge. When full, scrapings are placed in a pail for melt-down. "This keeps all the burr comb, propolis, honey and other stuff off the floor and out of the way," points out Tom, "and you'd be amazed at how much wax we collect this way."

pumped up to a flash heater suspended from the ceiling. There, more baffles help rid the product of impurities. The hot water heater warms the honey just enough to dissolve any sugar crystals present, and then it is quickly cooled using cold water.

The almost-finished product comes out of the flash heater only a little warmer than room temperature. But even here, a final filter removes any last bits of wax or foreign material that haven't been caught yet. The now finished product is then put in a barrel for future packing.

While the barrel is filling a one pound sample is taken so Tom knows what's inside a week, or a month later.

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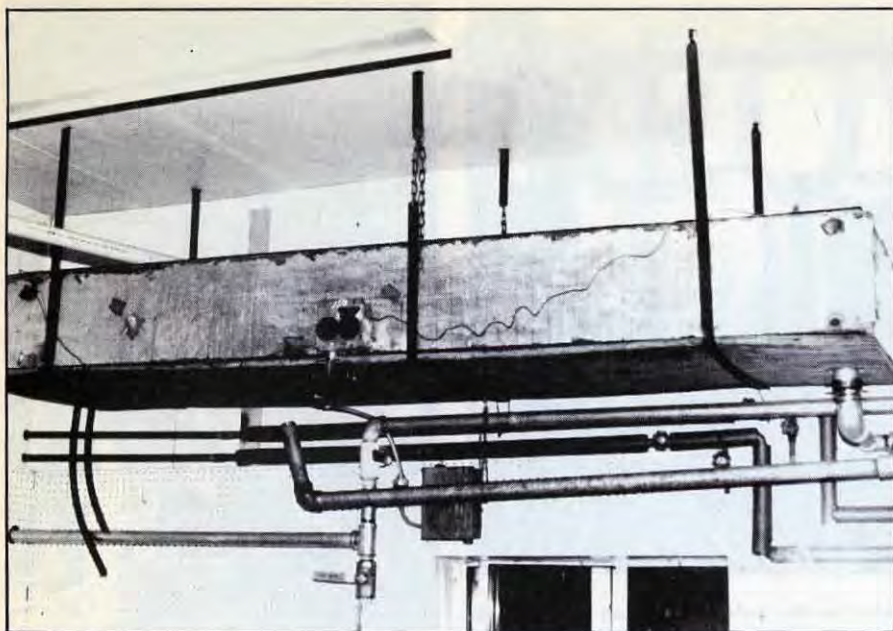
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From the extractor, honey runs into a baffled sump in the floor, and then is pumped into the flash heater. Fed with hot and cold water lines, and equipped with more baffles, the honey is quickly heated to dissolve sugar crystals, then rapidly cooled to preserve the unique flavors and aromas of their local sources. The honey is heated to between 100 and 110° F.

"Each sample, and the barrel it came from are given identical codes so we know what came from where," Tom states. "That way, I can go right to a barrel when I want a darker honey, or a lighter color," he adds.

"It also makes inventory easy later on," says Dorothy. "I need to know what we have in stock, so if I get a big order in a few months I'll know right off if we have some or we'll need to buy some in."

Dorothy is the primary sales person for the business. She makes deliveries to the grocery stores and bakeries, the speciality stores and warehouses that Tonn's Honey goes to. But before she makes the deliveries, she first makes the cold calls to those places, always looking for more customers.

"Most of our business is to local outlets" says Dorothy. Store owners like a local product because it tells their customers they are involved in the community, and the quality is good because they know the producer "personally".

The Tonn's recently commissioned a label design, and the attractive yellow, green and red emblem stands out on any shelf, no matter what color the honey is in the bottle.

"We spent a fair amount getting the label designed, and doing all the paper work so we could put a bar code on it for all the sizes we sell," says Tom.

"The bar code is absolutely necessary to get your foot in the door of a lot of large markets", Dorothy adds, "and if you're in this business to stay, you need those big accounts."

Service is another factor that Tonn's Honey provides their customers. "I'll check our product in a store, even if I'm not making a delivery", says



When the honey leaves the heater it goes through a final filter before reaching one of the settling tanks. When it has settled long enough it is emptied into a barrel and a sample is taken for future reference.



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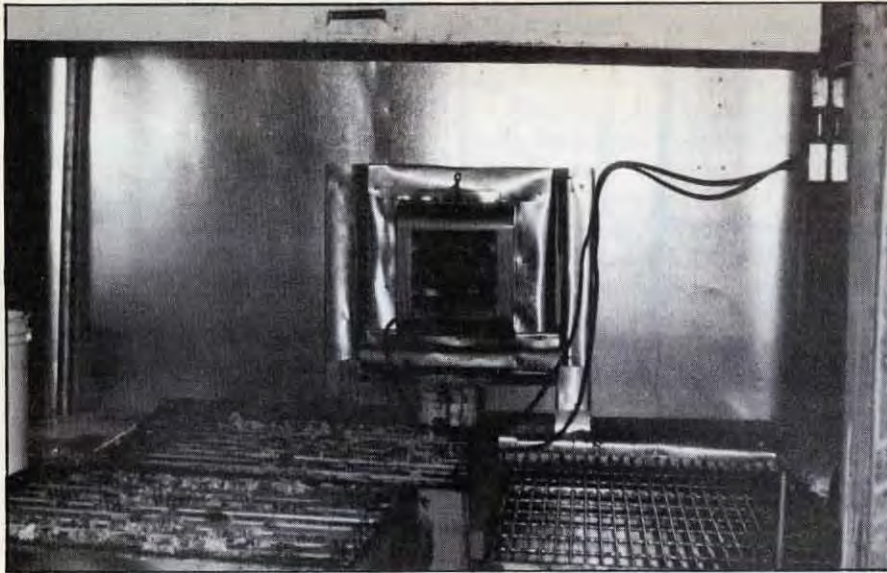
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A look inside the warming cabinet for honey barrels. Constructed by Tom, it can hold as many as four barrels at a time if required. It is thermostatically controlled, and the honey in the barrel never reaches 100°. It is occasionally used for storage.

Tom's home-made giant solar wax melter. The top is actually an old aluminum storm door, fitted with two sheets of plastic. The box is made of wood and insulated. "All the cappings, burr comb, broken combs and any other wax I have goes in here," says Tom. It will handle a whole seasons worth in just "two or three weeks," he adds, and it works perfectly for an operation our size.

Dorothy. "Crystalized bottles are removed immediately, as are any leakers or sticky jars. It makes us look good when we're stacked next to a brand that doesn't take good care of their product," she says. "In fact, we've gotten several increased or exclusive accounts for this practice alone."

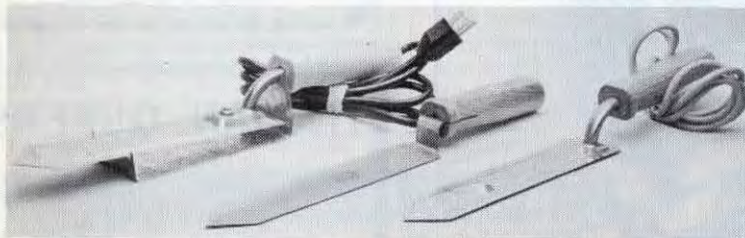
"We're not the biggest, or the fanciest, or the most modern operation you'll run across," says Tom Tonn, "but we know what we like, and that's what we give our customers," he adds.

And, it seems, that's what Tonn's Honey customers like, because business is good, and getting better. □



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Everybody needs to be challenged once in a while, and when old hobbies wear thin, something new needs to be found. I was at that stage awhile back, searching for something new. Something with enough technology to make me think, but also something with an opportunity to be outside and enjoy nature. Golfing and fishing had been exhausted and gardening is not my bag. I was having a hard time finding something new. I tossed the subject around at lunch breaks and a fellow employee said "I've got just the hobby for you — Bees. They don't take much effort. All you have to do is go out and collect the honey in the fall. You'll also have lots of opportunities to experiment so they produce maximum yields each year."

This sounded like a winner so I sent for some catalogs and was directed to a local equipment supplier. This man turned out to be very helpful and instead of pushing his products he suggested I go about five miles outside of town and talk to Mel, another beekeeper. These two individuals were my first contact with keepers of bees, and I can say with all honesty that I've never met a beekeeper I didn't like. Anyway, Mel felt he was getting a little old to take care of all his bees and was interested in selling

two of his hives. My wife had been encouraging me right along so the two of us went out and investigated. We looked at the two hives and his offer was within reason. I told him I would accept with one condition, that we leave the hives in his backyard and that he teach me how to manage them. The deal was made.

The summer was great and we had a heavy nectar flow. I had read several beekeeping books and things progressed as planned.

When September rolled around, Mel's wife called and indicated that the following week they would be out of town for three days. She would appreci-

The night before the big day I had difficulty sleeping, thinking of all the honey we would be harvesting. I read my books again and went through the procedures, which I knew couldn't fail because they were so simple. My enthusiasm infected my wife and I insisted that she come along to witness this event.

Morning finally came but when I opened the drapes, all I saw were clouds and a fine mist. I recalled that the books advised against taking honey on rainy days, but, I rationalized, it's not really raining and I did promise Mel's wife the supers would be off by the time they returned. So I put on my coveralls and my veil, got out the fume boards and bee escapes, and my wife and I set out for Mel's.

When we arrived, everything was calm and I thought, boy, this will be easy. I parked the car in the backyard and told my wife to stay there and watch. Then I smoked the two hives, took off the inner covers and placed a bee escape in the center. Then, I slipped these down just above the excluders. Next, I poured Bee-Go on the fume boards and placed them on top of the honey supers.

By now I had stirred up a fair amount of activity and I noticed the



ate it if I took our honey off while they were away. "No problem," I said, "we will take care of it." Mel had agreed to loan me his small extractor and holding tanks for the operation and I picked them up and set up my manufacturing operation in the garage at home.

sound coming from these colonies was rising in frequency. It was also about then that I looked over at my wife and saw her swatting bees and jumping into the car. Well, I waited a reasonable time, I thought, about 10 minutes, and looked under the fume board. The book said the bees should all be out of the honey supers but they were still there. Let's give them some more time, I thought, another 10 minutes. Still the bees were there and it seemed like even more were flying about.

Well, I thought, maybe if I pull each frame out of the top super and brush off the bees I can place it in yet another super and take it to the car. I brushed the first frame clean and set it in a super on the ground. I brushed another one clean, but by that time the first frame was full of bees again. This was not going according to plan.

Then I thought, if I carry the full super to the car and put it in the trunk the bees will leave and return to the hive. I grabbed the top super and took off. When I got there I found my wife locked in the car, loudly complaining that she had been standing there, minding her own business, when sev-

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eral bees suddenly made their presence known. And no, she didn't think it was funny. I went back and took off the second honey super and found a large mass of bees sitting on the bee escape. Could it be there were too many bees for that one little escape? The problem, and the answer, hit me like a ton of bricks.

However, I was this far along and I couldn't stop now, so I went back and tackled the second hive. For some reason the book didn't say anything about the continually rising sound from the bees and the machine gun popping noise they made when they hit my veil. I've seen bee beards so maybe it was alright that I was covered with them now.

I finally got the supers in the trunk, closed up the hives, and walked back to the car. It was a little disconcerting

because I could barely see my wife sitting inside because of all the bees sitting on the outside. What I could see was a petrified girl sitting there, with a glazed look on her face. She managed to blurt out "you're going to walk home because I am *not* opening this door."

"Look," I said, "why don't you drive down the road a ways and the bees will stay here." She started the car, turned on the wipers to clear the bees, and took off. As she drove down the road a cloud of bees followed. Several times she drove back and forth but the bees would not leave.

Finally I said, "when you drive off the bees follow behind the car. The next time you pass by, slow up and unlock the door."

I don't know how I convinced her to do that, but it worked and I got in bee-free.

By then she was barely speaking and was ready to go home. We took off and five miles later when we pulled into our driveway, yes, the bees were still with us. She ran into the house leaving me to fend for myself. I moved the supers into the garage and decided to wait until the next day to extract. Frankly, I

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had had enough of bees for one day.

The next morning found the bees clustered on my brick chimney and on the windows in the garage. I was informed, in no uncertain terms, that I was to get rid of those bees, now, in case some of the neighbors came over to see what was going on. The only solution that came to mind was my shopvac and it worked like a charm. However, I

would have preferred taking them back to their hive. After several hours of cleanup, and with my sincere assurance that the bees were gone, my wife came out for inspection. The balance of extraction was uneventful, except that my arm was in a sling for a week afterwards from turning the hand powered extractor. The yield was great, though, and we took in our first crop of about

120 pounds of excellent honey.

Things are better, now, and I have gained a lot more experience. But every year, when the harvest moon shines in the sky, I am reminded of how close I came to living alone with my bees. □

Duane Burdick lives, with his wife and his bees, in Midland, Michigan. He's a retired chemical engineer and has four colonies of his own.

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PICNIC

It's a hot, lazy August afternoon and you and your family have just finished a game of badminton in the backyard. This is the time that beer commercials dream of, and you've got a cold one waiting on the nearby picnic table. But just before you take that long, cool swallow you notice — BEEES! — floating in the glass you were about to drink out of. And they're not even dead!

It's a wonderfully mild, pleasant Sunday afternoon and you and your entire family are enjoying the annual outdoor cookout in the city park. Hamburgers, hotdogs, beer and pop, potato chips and potato salad — the works.

The food's been on the table for quite awhile now, all during the softball game and the horseshoe pitching contest. Even during the photo session Aunt Julia insists

on every year. All during the day.

Kids have been snitching chips and marshmallows, cold hot dogs and candy bars all day, and all around the table on the ground are bits of this and that they've dropped. Half full and forgotten plastic cups of beer, pop, milk and even water are scattered around the picnic site like Ma and Pa Kettle's living room in a rain storm.

When it's finally time to eat you notice the mess on the ground; the flies taking advantage of the carelessness; and a BEE or two flying around. Suddenly, it seems there's more than one flying around. In fact there seem to be hundreds. Landing on your hamburger, dive bombing the hot dogs while they're still on the grill. There's three on your beer glass and even one crawling on Aunt Julia's nose!

Friend — you've just entered "Picnic Panic" time.

This is the time of year "Picnic Panics" most often occur, and they can ruin a day at the park, or an afternoon in the backyard. But with just a little understanding of why those bees are around, and following these few suggestions you can avoid, or greatly reduce these hymenopteran encounters. But the best part is you won't have gallons of toxic pesticides polluting your home, backyard or picnic area.

First, let's take a close look at who these uninvited guests really are. Unless you live in the extreme southwestern part of the U.S., you can be almost certain that the critters buzzing your hotdogs are either Yellow Jackets, or their close cousins, the Hornets.

Yellow Jackets, Hornets and Bald or White Faced Hornets are members of the Vespid family of insects, and nearly all follow the same basic life style.

Lifestyles of the Venom Vendors

Adults forage in the area around

their nest, searching for food for themselves and their young. Workers catch flies, caterpillars and other high protein snacks and return them to the nest to be fed to the young. During late summer, nest populations reach maximum, and the pressure to gather food is at its greatest. This forces the workers to forage further from home and to investigate less than optimum food sources — like hot dogs and steaks.

Adults need to eat, too, but their diet consists primarily of sweets — like flower nectar, fruit juices and pop. Many naturally occurring sweets tend to ferment as they ripen, like rotten apples on the ground, and give off a characteristic sour odor, very much resembling beer. Adults and young need water on a regular basis, and some foragers are always on water patrol.

Though eating habits may be similar, these picnic pests have different, and distinct living arrangements, and are also easy to tell apart at a glance.

Yellow Jackets

Yellow Jackets are shiny yellow, with black markings. They are just a little over three quarters of an inch long, and have long, spiny legs. They



are stout, robust insects, and are rapid flyers. They generally nest underground in large colonies which can reach 5000 individuals by fall. Members will aggressively defend their nest when disturbed by lawn mowers, or volley ball games. Maximum populations and increased outdoor activity by people are why Yellow Jackets are noticed most often during late summer.

PANIC



Hornets

Hornets are shiny black, with bright yellow markings. They're easy to distinguish from Yellow Jackets though. Primarily black, Hornets have a very narrow waist and a short, nearly blunt abdomen. They're also smaller



than Yellow Jackets, measuring just over a half inch long. They live in large paper nests which hang in trees, eaves of houses and the like. They are very sensitive to vibrations, and will aggressively pursue attackers throwing stones or shaking limbs.

Bald, or White Faced Hornets

Bald, or White Faced Hornets are similar to regular hornets. They are shiny black, but with whitish/yellow markings. They are also just over a half inch long, and live in somewhat smaller

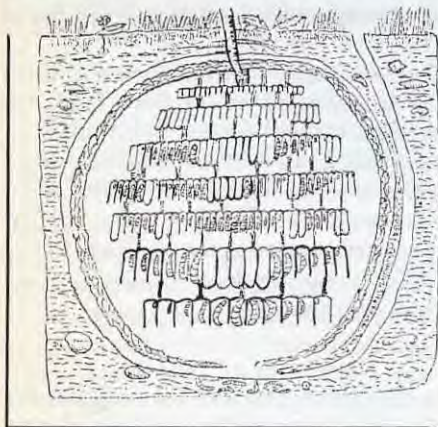


Diagram of yellow jacket's nest towards the end of summer.

paper nests than their cousins. They are very aggressive when defending their nests, and are sensitive to vibrations and other disturbances.

Honey Bees

Very rarely will honey bees visit your picnic. They are one half to three quarters inch long, brownish black and golden colored and have stout, very hairy bodies. It is the vast amount of hair that makes them so easily distinguishable from other bees. They are relatively slow moving, when compared



to our friends listed above. They are attracted to sweet drinks because they are primarily flower nectar feeders. Honey bees nest in man-made hives, hollow trees, rock cavities or buildings.

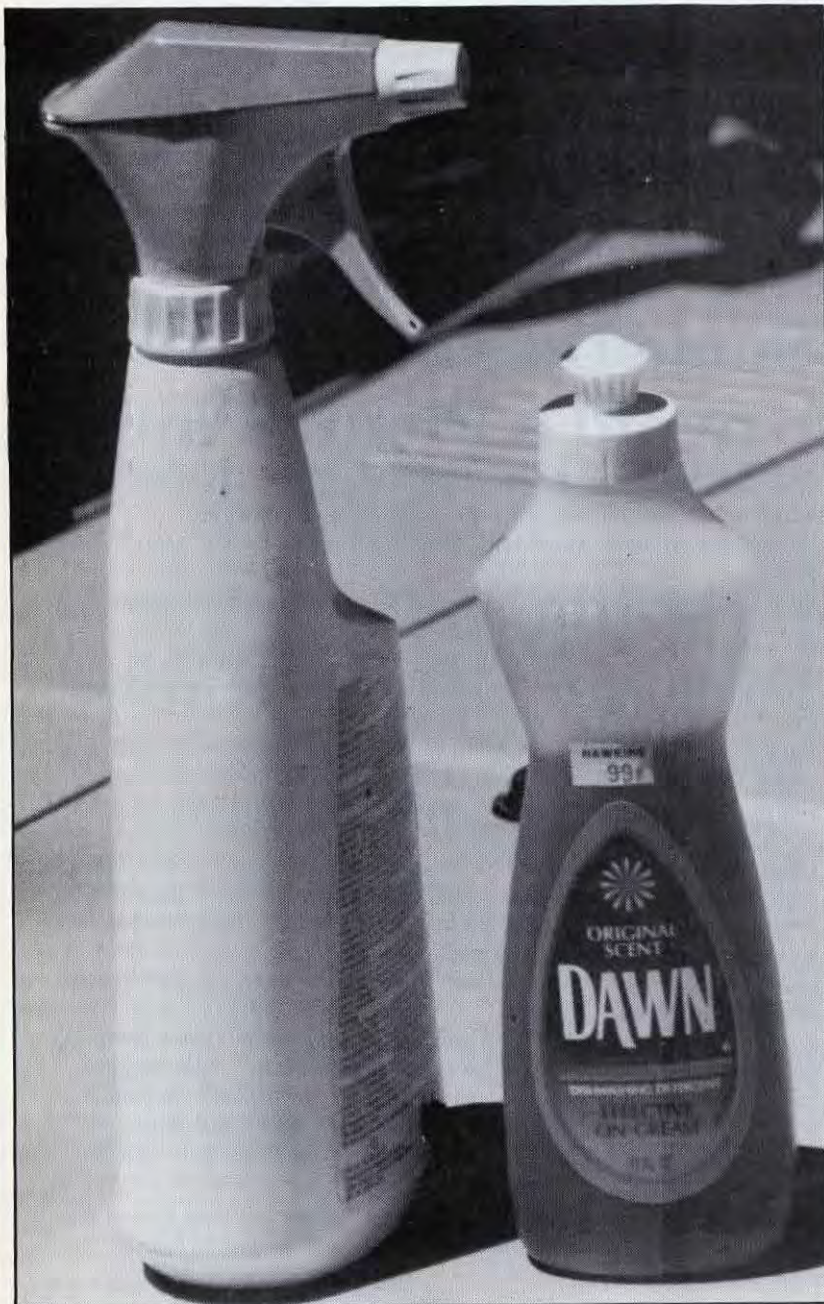
Some Do's and Don'ts to avoid a Picnic Panic

- Wear smooth, tan or white colored clothing
- Avoid excess hair spray, perfume, cologne, 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.

Follow these few simple guidelines and Yellow Jackets, Hornets or even the rare honey bee will seldom cause you a "Picnic Panic" this summer. □

TO KILL A HONEY BEE

BUZZ PHILLIPS



It starts as a routine phone call, about noon on a warm, sunny day. The caller's voice is edged with far more panic than the usual swarm call.

"The Police Department says you take care of bees, and that you'll come right away. I've got an emergency."

You get the address, your swarm gear and you're gone. Ten minutes, tops, from first ring to out-the-driveway.

The emergency is obvious — a huge swarm is hanging from a sign six feet above the main entrance of a large, busy store. There's no other door, the customers are lined up four deep afraid to go in, and the owner is furious — at You!

"Get those @#*# bees out of here, right now! And make sure you don't leave any," the store owner yells and stomps inside.

Lots of customers and onlookers are standing around and more are showing up every minute. This is not going to be easy.

The obvious and usual methods of handling this just aren't going to work. Shaking them into a box, lots of bees buzzing around, waiting for the rest to follow — nope, not this time. Too dangerous.

First choice — leave 'em hang. Second choice — let somebody else do it. Third choice — ???

There's equipment available to make this work. Adapted shop-vac systems might be able to handle it without too much fuss — if you have one that is (they are expensive), because most of us don't. So ... what's left?

The owner wants them gone, **NOW!** People are getting closer, the swarm is 15 feet up, it's hot — yes, gardening looks more appealing every minute.

In situations like this the only answer may be to kill the bees. Rapidly dispatching a swarm in a location perceived as dangerous will certainly do more for the image of

SOAPY SOLUTIONS

There are a multitude of uses for this technique that don't involve swarms, panicky people or dangerous situations.

- During extraction, bees inevitably gather on windows, lights or doors. If these places don't have bee escapes, bees will continue to accumulate. Soap spray eliminates them without using pesticides, and you will have clean windows when extraction is done.

- When moving bees from one place to another, almost always there are some left at the original site. If moving them was because of a nuisance complaint (or just before one was to be made) you don't want to aggravate a delicate situation with a lot of angry bees left behind. They can be quickly dispatched, avoiding problems.

- Panicky homeowners can be calmed with advice about this technique. When swarms land in irksome places (around doors or windows), the errant intruder can be safely killed using soap. This will give the homeowner something safe to do until you arrive, and a way to handle the few that are always left after you are gone.

- Whenever there are supers of honey in transit or stored, spraying robbing bees with soap will stop them cold, avoiding any recruiting trips (CAUTION: don't spray solution on combs containing honey). Also, when washing down the back of a truck that carried honey, using a mild soap solution masks the odor, and reduces strays from finding the minute honey that remains.

beekeeping than just leaving them hang, or causing a stir during retrieval. In fact, swarm removal may not even be an option when the African honey bee makes itself felt. Already there are rumblings in some city hall offices of "Take no prisoners. Kill all swarms. Period."



When spraying bees, whether on comb, hanging in swarms, or on windows, use a medium fine mist. Before starting, make sure your coverage is as wide as possible, while maintaining as much distance as possible — a definite trade off. However, coverage is more important than distance.

But how do you kill a honey bee?

Swarm control officials in Panama and other Central American countries routinely, and successfully, eliminate swarms of African bees using household detergent and water applied with a pressure sprayer.

Since practice makes perfect, *Bee Culture* staff tested this method recently. A couple weeks before our test a swarm took up residence in an abandoned, frameless nuc and quickly drew comb. We felt this would be a situation difficult enough to test this method, so it would be a good trial.

In our test we used a liquid dishwashing detergent rather than laundry powder. Laundry soap is commonly recommended because the concentration of active ingredient is sometimes higher. However, powders sometimes cake and become useless, while liquids remain stable over time. The ratio we used was one cup liquid detergent to

one gallon water but most use a half cup, especially when using powder. However, the cost is negligible, and the safety factor is increased using a one cup to one gallon mixture.

We used an ordinary mister-type sprayer to apply the soapy solution for a couple of reasons: they are commonly used by beekeepers so most have one floating around; also, if you don't have one they are immediately available in any store.

Common garden sprayers, those operated by air pressure, are probably better, though. The wand allows a little more control and the steady pressure relieves the need to continuously pump the trigger.

There were three combs fastened to the nuc's roof. We lifted it off and turned it upside down, mostly so we could record the research. As soon as the cover was placed on the truck's tailgate the spraying started. One side

Continued on Next Page

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KILLING . . . Cont. from Page 463

of the first comb was sprayed, then it was pried back and spray applied between it and the next comb. This is where higher pressure would make penetrating the mass of bees that settled between the two easier. It would be absolutely required with more bees or larger or deeper combs, but our mister was adequate here, and would probably work on a hanging swarm. However, erring on the side of caution and using heavier armament would be safer, and maybe even faster.

We easily, and quickly, finished the job on the next comb, and estimate there were about two pounds of bees in the nuc. In total, we used a little less than a pint of soap solution — *and every bee was dead in less than four minutes!*

This is typical, in fact, routine. Using pressure sprayers loaded with cold-water soap solutions, Panamanian officials trained in swarm control dispatch African swarms on a daily basis. No big deal.

So why does it work? There are several factors at work, but the importance of each is difficult to prioritize.

First, soap has several effects on insects and has been used as an environmentally-safe, non-toxic insect con-

trol for many years. It greatly reduces the surface tension on the hairs of a bee's body, allowing the water to cover and soak into each one. This immediately adds a fair amount of weight to the bee. Water alone only beads on the tops of the hairs with no further penetration and corresponding weight gain.

Second, once the soap penetrates to the skin two things happen. The evaporation process immediately begins to cool the body temperature of the bee (even if you use warm water this occurs, but cool water seems to work faster). This reduces the bee's ability to fly, or even crawl. At the same time the wings lose their ability to shed water, becoming wet and heavy. Bees that can't fly or crawl can't cause problems, thus eliminating the greatest observable danger in populous areas.

When the soap solution reaches the cuticle or skin of the bee, a physiological reaction occurs that alters lipid (protein) structure. This results in the once water-proof skin to no longer keep liquids in or out. We talked to several entomologists who offered different, but similar, theories of what exactly happens. Basically, the liquid hemolymph (or blood) of the bee 'leaks' out, while water from the spray 'leaks' in. Quite likely the trachea are blocked at

the same time so the bee can't breathe.

The end result is dramatic. The bees sitting on combs when sprayed dropped without so much as a buzz. Those that were only lightly dusted dropped but were able to crawl for a minute or so, but not much longer. Flying bees, those that took off when we removed the cover and before the spraying started, were stopped in their tracks with well aimed mid-air blasts — once hit they dropped like stones — small, wet stones.

It was all over in less than four minutes. The slaughter was complete.

We did a follow-up study later with the comb. It was melted down in a solar melter, cleaned and made into a candle. It burned perfectly, with no odor or burning problems, and no apparent color changes.

Opportunities to use this method of swarm control may be few and far between. But this will change, either by the beekeeper's choice or municipal decree. Maintaining control during a potentially dangerous situation and offering a much needed public service (even if a fee is involved), will do much to enhance the profession we are a part of. But far more importantly, one day it may save a life. □

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Laying Workers

STEVE TABER of Honey Bee Genetics

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"The exceptions to this phenomena are what really interest me."

If you're new to beekeeping you've probably never seen laying workers. But if you raise queens you've seen laying workers many times. Let's take a close look at this strange biological event — worker bees that lay eggs.

When a queen is removed from a colony, the bees almost always raise a new queen, with a virgin emerging in about 11 days (though not exact, this is close enough right now, exceptions will be discussed later). More often than you might think, the emerged virgin is lost on her mating flight.

The bees are then in a position of no queen and no way to get one. After a week or so several workers will begin laying eggs. Usually these turn into drones but not always (one of the exceptions I mentioned).

If this colony was fairly populous when it lost its queen, it had 3 or 4 combs with scattered brood of all ages. You'll also be able to find drone cells and

queen cups with multiple eggs in each cell, and a few drones will eventually emerge. One of the older books I have says that to cure the situation, simply move the colony about 100 yards and shake all the bees on the ground. It says that laying workers will stay on the ground (they are too heavy to fly) but all the rest will return. Don't believe that for one moment.

If you want to return the colony to normal, give it a comb that has both eggs and very young larvae. Nothing else needs to be done. Do not expect this queenless colony to raise a good queen for you, though. Good queens are raised only by young bees, not old ones. If this queenless bunch of old bees is found early enough in the year you can introduce a new queen and they will most likely build up before winter. However, if it's late in the season (like now), it's better to unite it with another unit.

One of the exceptions I mentioned

is that in a large colony during a honey flow it is normal for a small number of worker bees to lay a few eggs, even though the colony has a good laying queen. In fact, it's my opinion that during late spring, when bees are rearing the greatest number of drones, many are the result of laying workers. I'm not aware of any research to determine how frequently this occurs, though.

However, H. K. Poole took the first step in this kind of research many years ago when we were both working in Tucson, AZ. He dissected worker bees from normal, queenright colonies during late spring and looked at their ovaries. He found that about one worker out of 100 was capable of laying an egg that day. We never ran experiments to see if there were workers laying eggs or not but I suspect they were.

There are other 'exceptions' that

Continued on Page 467



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RESEARCH REVIEW

DR. ROGER A. MORSE

Cornell University • Ithaca, NY 14853

"Listen — there's more out there than we thought."

It has been known for a number of years that there is a sound produced by foragers that dance to recruit other bees to seek the food they have found. The sound is made by the dancers vibrating their wings. This is different from the wing movement in flight. Recruits cannot learn the direction and distance of the food from dancers that have had their wings clipped or by genetic mutants with reduced wings. This indicates that the production of sound is an important part of the information given by a dancing bee. Some foragers make silent dances and these too are ineffective.

However, textbooks on honey bees state clearly that they cannot hear airborne sound. The problem, it appears, is that we have been thinking about the wrong kind of sound and looking for the wrong kind of sensory receptors.

The sound with which we are familiar is carried by waves and what we detect with our ears are oscillations in pressure. This type of sound can be carried for long distances. The sound that honey bees hear when following dancers is caused by the movement of air particles. It is a type of sound that can be heard over a short distance only, less than a quarter of an inch. Thus, for a recruit to detect the sound made by a dancer she must be very close.

A recruit that follows a dancer holds her two antennae perpendicular to her face but at an angle of 90° to each other. What is now thought is that hairs on the basal antennal segment (the pedicel), called Johnston's organs, are the sound receptors. Interestingly, these organs were described by Johnston in 1855 on mosquitoes. Many insects have such organs but their true

function has not been clear, especially in honey bees. These sensory organs have nerve cells that feed into the antennal nerve trunks and the brain.

Experiments to show that airborne sound was received by recruits were done in the following way. Bees taking sugar syrup from a feeder were exposed to a sound of an appropriate frequency and after feeding for four seconds were given a mild electrical shock. This caused them to withdraw from the feeder. After repeated trials the bees learned to withdraw from the feeder when they heard the sound even though there was no shock. The sound was made by using a small glass tube through which the sound from a loudspeaker was driven. The tube was directed at the feeding bees.

When honey bees were exposed to sound and an electrical shock in a large wave tube, they failed to associate the two; this indicates that sound waves and particle movement cannot be sensed or heard over longer distances. In addition to the above, bees that were trained to associate sound with an elec-

trical shock were reluctant to land at a feeder when the sound was left on continuously.

The neat trick in the research cited below was to use a tuned tube that created standing waves. In such a tube there are some regions where pressure variations are greatest (we would hear the sound in these regions) and other regions where pressure did not vary but particle vibrations were great (we hear no sound in this region). When honey bees were tested at these locations they did respond where displacement was great, but not where pressure differences were great.

The findings reported here open a new area of research as to how bees obtain information from a dancer. When we look back through the literature we realize that not everything about honey bees and sound is new. A Russian researcher (E. K. Es'kov) reported nearly fifteen years ago that bees could hear in this manner but his experiments were apparently not convincing. Also, this research should not be confused with the fact that honey

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RESEARCH . . . Cont. from Page 466

bees respond to vibrations and what we call substrate borne sound. For example, bees can be caused to freeze by some such sound. In yet another example, when one beats rhythmically on a hive (drumming) the bees respond by marching upwards in a hive and even abandoning brood. The receptors and function are both different and their role in bee biology remain unknown.

At this point I can't help again paraphrasing one of Karl von Frisch's thoughts. He said that studying honey bees was like taking water out of a well. One might take a bucketful of water out of a well, and learn a great deal, but immediately another bucketful of water would run in and there were more questions to study. Another thought is that while much sophisticated equipment was used in these studies the basic tool was still an old fashioned observation bee hive; observation hives never seem to lose their usefulness. □

Reference

Towne, W. F. and W. H. Kirchner. *Hearing in honey bees: detection of air-particle oscillations.* Science 244:686-688. 1989.

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TABER . . . Cont. from Page 4655

aren't quite true, though, and some strongly cling to their beliefs. These differences of opinion are what make beekeeping so interesting and also lead to some hot arguments at times. One of these you've probably heard is that workers from a queenless colony will visit a neighboring hive and steal an egg from it. Then, they'll return to the home hive and raise a queen from this egg. No proof has ever been given for this statement. Proof that an egg from another hive had been raised to a queen would have to be done genetically, showing color or other differences.

There are some exceptions that are true, though. We know that a virgin queen reared to lay eggs will produce about one egg per thousand that develops into a parthenogenic female. Otto Mackensen first reported this and it was later confirmed by K. Tucker. I have seen several of these parthenogenic worker bees in my hives since they are easily recognized by their vastly different color.

Since it seems true that if an occasional unfertilized egg laid by a virgin queen develops into a parthenogenic worker, it follows that laying workers would produce parthenogenic offspring at about the same rate. Large, queenless units have been recorded as producing more than 1,000 eggs, and I would suspect a few to be parthenogenic, and hence a potential queen larva would exist. I have never seen a queen raised this way, but I strongly suspect it could be done.

If you look hard at your bees with laying workers, you may find a situation like this. Actually, this has recently happened in a big way. A beekeeper in Southern Arizona has reported that his laying workers raise mostly worker bees. Some of this stock has been turned over to the USDA Bee Lab in Tucson while he retains many of the queens that produce these worker-producing-workers. And yes, they have successfully grafted these worker-laid eggs and raised queens from them. Now, isn't that interesting? □

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HOME HARMONY

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Honey bees are responsible for pollinating many of the foods we eat. However, every once in a while we come upon a favorite food that probably does not need honey bees. Consider beans: pole beans, bush beans, snap beans, green beans, dried beans, wax beans and broad beans. Lima beans may be an exception here, though. More pages are devoted to beans in seed catalogs than just about any other vegetable with the possible exception of tomatoes. Honey bees do not contribute much to the tomato plant either.

Green beans once grew with tough strings along the pod which made preparation of fresh beans quite tedious. But horticultural efforts have brought us a tender, stringless bean and the words "string bean" have vanished. The wax bean, with its delicate flavor, remains popular and its color combines so well with the green bean. The flat Italian bean gains in popularity and brings us the green bean flavor in a different shape. But the most spectacular array of beans is found in the dried beans: pure white, deep maroon, rich brown, speckled, spotted and "eyed". In many cases they can be used interchangeably and also mix very well

with green beans for an interesting dish.

Unfortunately, just as the honey bee is not needed for pollination, honey does not contribute very much to bean cuisine. Yes, it is true that baked beans are much better with honey as the prime ingredient but the majority of green bean, and even dried bean dishes use other seasonings and flavorings. Therefore, do not overlook substitutions. If a recipe calls for sugar or molasses, no matter what quantity, just substitute your favorite honey and your finished dish will be very pleasing.

Green beans can be canned or frozen very successfully, and used interchangeably in recipes. In recipes calling for canned green beans or frozen, use the indicated quantity of fresh that have been briefly steamed or simmered. Steaming is by far the best way of cooking to preserve color, flavor and vitamins.

If a recipe calls for just plain green beans, use half green and half wax beans for color interest. Or use the Italian flat bean for a different shape. The dried beans do have some individual characteristics. For example, the navy bean retains its firmness when cooked. The great northern bean cooks faster but may get mushy. A bit of experimenting with the dried beans will show you which are best suited for your particular recipe. Try a new dried bean in your favorite recipe.

Tender green beans can be cut lengthwise, french-cut, for enhanced flavor. However, beans that have been picked a bit late should be cut crosswise into fairly short pieces. A long diagonal cut looks attractive and is as quick as a simple cross cut. Leave a few beans long and uncut for decoration.

This recipe has been one of my favorites for many years. It is quick and

tasty. I have used fresh beans either steamed or cooked in a microwave, canned beans or frozen beans. I generally choose a flavorful honey.

• Green Beans

- 3 strips bacon cooked and crumbled
- 1 small onion, sliced
- 1 can water chestnuts, drained and sliced
- 1 pound green beans
- 2 tablespoons cornstarch
- 1/4 teaspoon dry mustard
- 1 tablespoon honey
- 1 tablespoon cider vinegar

Cook bacon until crisp. Remove from skillet and crumble. Pour off all but a tablespoon or two of the bacon grease. Brown the onion and water chestnuts slightly. Drain beans, saving 1/2 cup liquid. Mix cornstarch with bean liquid. Add this mixture and rest of ingredients to skillet with onions. Add bacon. Heat while stirring until mixture thickens and turns clear. Add beans. Heat and stir well.

Green beans combine well with certain other vegetables. Try this recipe with celery. The two flavors really

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• Honey -n- Green Beans

1/2 cup sliced celery
1 tablespoon butter
1-16 oz. can French-style green beans
(fresh or frozen)
crisp bacon bits
1 tablespoon honey
salt and pepper to taste

Saute celery in butter until crispy tender. Stir in green beans and bacon bits. (Fresh or frozen beans should be cooked and drained.) Heat thoroughly. Add honey and mix well. Season with salt and pepper. Serves 3-4.

A Honey of a Cookbook
Texas Department of Agriculture

August is definitely picnic month. Two popular picnic items are baked beans and the mixture known as "three bean salad". Try these versions of those dishes and introduce people to the pleasures of honey cookery. Take some copies of the recipes along to the picnic to hand out. It might be a good idea to have a few jars of honey tucked away in your car just in case someone does not have any honey to try the recipe.

• Sweet-Sour Bean Surprise

1 (15-1/2 oz.) can yellow beans
1 (15-1/2 oz.) can cut green beans
1 (15-1/2 oz.) can red kidney beans
1 chopped green pepper
1 chopped medium onion (optional)
3/4 cup honey
2/3 cup vinegar
1/2 teaspoon pepper
1/2 cup oil
1 teaspoon salt
1 cup salted Spanish peanuts

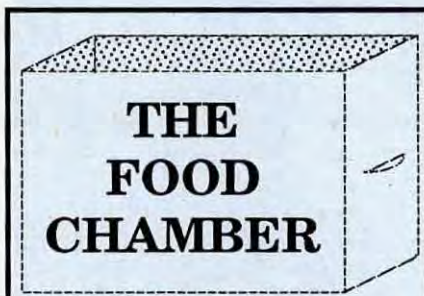
Drain liquid from beans and combine. Mix remaining ingredients and pour over the bean combination. Refrigerate several hours or overnight. Drain and serve. Serves 8-10.

A Honey of a Cookbook
Texas Department of Agriculture

• Bean Casserole

1 (28 oz.) can pork and beans
1 (14-oz.) can red kidney beans, drained
1 (14 oz.) can green lima beans, drained
1 (14 oz.) can wax beans, drained
6 strips bacon
1 medium onion, diced
1/4 cup finely chopped green pepper
1 teaspoon dry mustard
1 teaspoon salt
1 teaspoon pepper
1/2 teaspoon garlic salt or 1/4 teaspoon
garlic powder
2 tablespoons white vinegar
1/2 cup honey
1/4 cup ketchup

Preheat oven to 350°F. Place beans in a large casserole. In a skillet, fry bacon until crisp. Remove from skillet and crumble. Pour off drippings except for 2 tablespoons. In remaining drippings saute onion and green pepper until



Pots and pans certainly come in an incredible array: glass, aluminum, cast iron, stainless, coated and non-coated, thin and thick, and much more. What to use for your purpose can be quite a puzzle. All of us have a favorite saucepan that seems just the right size and cooks everything just right. However, each type of cooking utensil has its advantages and disadvantages. Glass pans are ideal for baking loaves of bread or pies. The heat properties of glass are such that the bread crust and pie crust will have a nice uniform browning. Loaf pans and pie pans also come in aluminum with a non-stick coating. These work very well but will not produce the nicely browned crust. Non-stick aluminum loaf pans can be the ideal pan for some of the fruit quick breads. There is no chance of a piece of fruit sticking to the pan and creating a problem when you are trying to turn the loaf out of the pan. More about pots and pans another time. □

onions are clear but do not brown. Add remaining ingredients and bacon and pour over beans. Mix gently but thoroughly. Bake uncovered for 30 minutes.

If you are really tired of encountering the "three bean salad" and want to try a definitely different bean salad, use this recipe from California.

• California Two-Bean Salad

1/2 pound dry black-eye beans, cooked
1 medium red onion, chopped
1 stalk celery, minced
1/2 medium green pepper, minced
1 medium dill pickle, chopped
2 sprigs parsley, minced
1 (16 oz.) can red kidney beans, drained
and rinsed
1 (6 oz.) jar marinated artichoke hearts
1/3 cup salad oil
2 tablespoons honey
2 teaspoons crushed oregano
1 tablespoon Dijon mustard
1 to 1-1/2 teaspoons salt
1 teaspoon coarse ground black pepper

Soak and cook black-eye beans according to package directions. Drain thoroughly. While still hot, combine with onion, celery, green pepper, pickle, parsley and kidney beans. Drain marinade from artichoke hearts and combine with oil, honey, oregano, mustard, 1 teaspoon salt and pepper. Pour over bean mixture, tossing lightly. Add artichoke hearts. Cover and chill 24 hours. Taste and add more salt as needed. Makes 8 servings.

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MORRIS SMITH ...a Profile

Morris Smith's first job in his family apiary was squeezing the smoker to keep it from going out while his father worked the bees. He was so young, and so short, that he was unable to see inside the hives his father was working. That was 75 years ago.

His father, George T. Smith, was a homesteader, dairy farmer, storekeeper, and the postmaster for Chitwood Station which is on the Yaquina River near Newport, Oregon. He kept about twenty colonies scattered around the area and sold honey, wax, and beekeeping supplies in his store. Around 1906 he even won a prize for his vine maple honey at the Lewis and Clark Exposition in Portland.

By the time Morris got out of high school he had his own pick-up truck and his thirty hives were producing comb honey which he sold to grocery stores. He also was on the "pit" crew in a local rock quarry, digging out a low, narrow, forty foot long tunnel into the igneous rock. Called a "coyote hole", the excavation had "dens" off to the sides which were filled with explosives.

In the summer of 1931, Morris' left leg was injured in an explosion. "I may be handicapped, but I'm not disabled!" he says. Never one to remain idle, he spent part of his recuperation period building a sailing kayak. In his homemade boat he explored the Willamette River around Portland, where he spent a year recovering from the accident.

When his therapy was over he went back to Chitwood Station. There he ran a truck garden and peddled a variety of fruits, vegetables, cider, meat and honey from his 35 hives door to door in Toledo and Newport.

But today he is most widely known as a bee removal expert. He considers this occupation a unique and interesting way of meeting people and over the last 40 years he has averaged at least ten bee removals a year. He has taken bees out of every kind of cavity, including holes in railroad trestles, wooden buildings, brick chimneys, trees, and even an old hot water tank. Removing bees from wooden structures is generally easy since sawing through siding or roofing to get at the nest is fairly straightforward. Getting bees out of a brick chimney is slightly more difficult, however.

"Bees usually build their nest as high as they can get, so most of the comb is going to be near the top," he explains. "You have to extend the handle of your hive tool with a stick and make a T-



ABOVE . . . Sometimes the bees cooperate and find a nice, easy place to nest. RIGHT . . . "Catcher hives need sealed brood to draw the bees out of the original hive," says Morris, "but sometimes I don't have any available. Then, I'll take some from the original hive and cut it to fit a frame which goes into the catcher hive." This step, placing a Catcher Hive, simplifies the job and keeps the bees a bit calmer.



shaped 'comb catcher'. When you start in, you'll usually lose the first comb because there is no way to grab onto it. But once you have a hole open, you stick the comb catcher in under the next comb before you start cutting with the hive tool. When you've got the edges cut loose, you just lift out the comb."

He demonstrated his technique for me a few days after his 78th birthday, scaling a thirty foot extension ladder to the top of a tall brick chimney. He used bailing wire to secure two "brackets" to either side of the chimney to hold his five gallon plastic buckets and his "catcher hive". When he's working on a wooden building the brackets are nailed to the wall instead of wired.

Another clever home-made device he uses is a sawhorse with legs on only one end, which he calls a "wall jack". Used in pairs, wall jacks are placed on the ground with the plain end against a wall. Planks are laid across them to form a strong, nail-free platform.

Although he owns a modern hat and veil, he prefers the pioneer style veil he grew up with. A wire frame, like a water bucket, is covered with screening and sewn to an old, thick jacket. A leather belt and gloves sewn in make a rugged, bee-proof garment.

Morris' favorite smoker fuel is well-rotted alder wood (*Anus rubra*), also known as 'punk alder'. Not only does it smolder for a long time, but the wood is free of the resins which taint the

flavor of honey. He uses smoke liberally when removing bees, and the lack of resins in his fuel makes it ideal for this purpose. He collects his smoker fuel in the winter by finding rotten alder logs in the woods. "When you can squeeze water out of the wood, it's perfect to take home and dry out for smoker fuel," he explains.

Among his many side interests, Morris is also an authority on antique varieties of fruit trees, mainly apples. In fact, he has single-handedly saved at least two varieties of apples from oblivion.

Around 1970, the Oregon Historical Society started a Pioneer Apple

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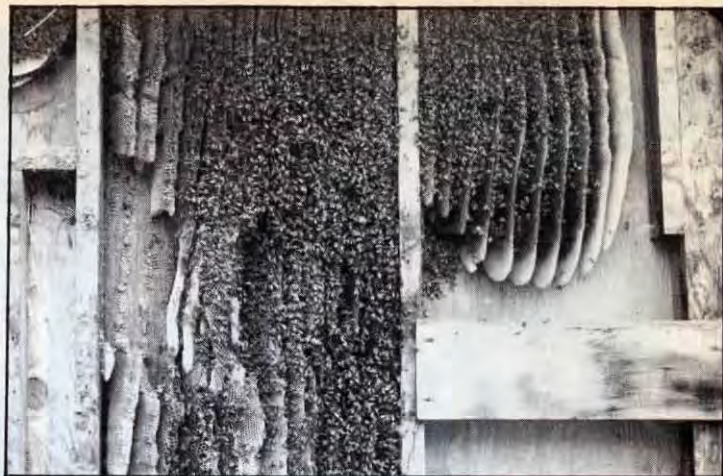
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But there's always the other side of the coin. This job is 40 feet up and has been here quite awhile. The platforms are nailed to the house and hold a hive, buckets, smoker, a saw and hammer, wash water and sometimes even bees.

Orchard on Sauvie Island, near Portland. The curator of the collection advertised a request for authentic Palouse apples. Morris was the only person in two states to respond to the request. This was because his father had worked on a ranch in the Palouse country of south-eastern Washington, and had planted a Palouse apple tree in his back yard when he moved to Chitwood Station. Offspring from that tree are now preserved at the Pioneer Orchard and at Cornell University.

The other antique variety preserved in the Smith family orchard is the Keswick Codlin which originated in England in 1770. It was probably brought to Oregon by the family who founded Chitwood Station around 1882. The curator of the Pioneer Apple Orchard searched from Canada to Mexico without success until Morris brought some to show at a meeting of

the Home Orchard Society.

More recently, he helped build a "Public Arboretum" at the Clackamas Community College to preserve more fruit tree varieties. An expert in the art of grafting, he can meld scions and stocks with nothing more than a sharp pocketknife and a roll of black electri-

cians tape. He also enjoys spending time pruning old fruit trees to rejuvenate and prolong their production.

Unlike most people in our mobile society, Morris still lives in the house where he was born. He has seen a lifetime of changes over the years — watched the highways come and the forests go, seen the salmon vanish as logging-caused erosion filled the streams with silt and turned the clear water into something resembling peanut butter. "When I worked in Toledo, ocean going tugs and barges could dock at the mill, but today, the channel is so full of mud that the lumber has to be trucked to Newport to be loaded on ships."

Less dramatic, but even more mysterious, is the change in the blooming period of certain honey plants that only a life-long beekeeper would notice or wonder about. In the front yard of the

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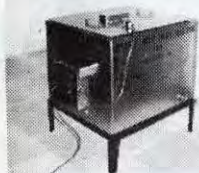
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family home stands an enormous black locust tree planted by his mother. Sixty years ago the tree blossomed on Memorial Day in early summer. People used to come by to pluck branches full of flowers to decorate graves. But over the years the bloom period for this tree and others in the area, has gotten later and later in the season. Today, black locusts in Morris' home county bloom around the Fourth of July. Why has the bloom time changed over the years? Perhaps

*Come on up — the view is great!
Chimney jobs are always tough.
Note how the platforms are wired
to the brick, and still are able to
hold all the necessary tools.*

changes in the climate, rainfall, or acid rain from the Toledo paper mill might be responsible.

Morris smith has done well with his talents and skills and has overcome some distinct obstacles in life. Though never married, he doesn't lack family or friends and with his skill and reputation in bee removal, he will never run out of things to do. □



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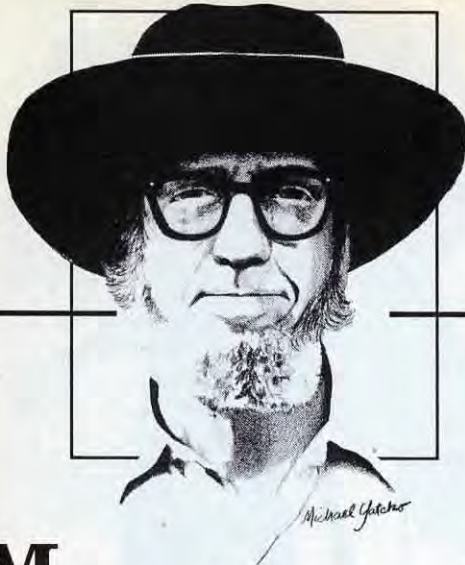
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BEE TALK

RICHARD TAYLOR

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My recent reference to a beekeeper in Pennsylvania who uses mentholated cough drops to control tracheal mites stirred quite a lot of interest. I had read that beekeeping organizations had spent something like thirty thousand dollars getting official approval to use menthol for mite control, and here, I had heard, was a beekeeper who just went down to the drug store and picked up some cough drops. One correspondent pointed out to me that a cough drop contains only five milligrams of menthol and, since the recommended treatment calls for fifty grams, then you would need ten thousand cough drops to do the job.

Well, I got in touch with Mr. William Draper, the Pennsylvania beekeeper, and he took the time, in this busiest part of the year for any beekeeper, to write me a long and informative letter. I'll pass along the gist of what he told me, but let it be understood that this is something about which I know almost nothing. I am not making any recommendations whatever. I am merely passing on what I have picked up from a highly reliable source concerning something of considerable interest.

Mr. Draper belongs to a beekeeping family, and they do an extensive business in bee supplies, pollination and so on, along with owning some eight hundred colonies. They were losing a fourth to a third of their bees every winter, largely because of mites. They were replacing them by making splits and buying packages from a long established producer, but then tests showed that those packages were themselves heavily infested with mites!

So Mr. Draper began to experiment

with mentholated cough drops, easily available and obviously harmless to people. He finally worked out a system which, he assures me, is effective, not for eradicating mites, but for controlling them. He puts just three cough drops right in the brood chamber cluster, as early as possible in the spring, to discourage the buildup of mites. This is repeated about every three weeks throughout the summer. These mild cough drops do not repel the bees, nor do the bees try to propolize them; on the contrary, they avidly consume them.

That was their only treatment for mites last year. Did it work? Well, they got their second biggest honey crop ever, and had the lowest winter loss since they have been in business.

Now we shall wait to see whether some bureaucrat, well-trained in the

cumbersome and heavy-handed ways of officialdom but bereft of common sense, steps forth to say "You can't do that! The proper way to address this problem is to spend thirty thousand dollars and fill out hundreds of forms and get all kinds of permits . . ." and, in short, get bogged down in red tape and expense. For my part, I hand it to the Drapers for tackling their own problem head on and, it would appear, coming up with a simple and ingenious answer.

Now, since we are already on the subject of honey bee pests, let me say something about wax worms. I don't mean the big ones that demolish the combs of a queenless and debilitated colony, but the tiny ones that sometimes get into comb honey and ruin it. I have heard from beekeepers in some parts of the country who say they never have this problem, which amazes me. Here these little worms will ruin a crop of comb honey in no time if you don't do something about them. Their damage appears first as tiny pin holes all over the surface of the cappings, and the honey is then ruined. Do not imagine that you can avoid this problem by storing comb honey in a moth-proof room. The wax worm eggs are apparently in the supers when you take them off the hive. I have never seen the eggs. They must be invisibly tiny. But there is an easy and complete solution. Put the finished sections in small plastic bags and put these in a good cold freezer for a couple of days, making sure the temperature falls back to near 0°F before you take them out. You'll never see a trace of wax worm. I usually wait a few days — but no longer — before packing the sections and getting them into the



Round sections bagged and ready for the freezer.

Continued on Page 476

GLEANINGS IN BEE CULTURE



SIFTINGS

CHARLES MRAZ

Box 127 • Middlebury, VT 05753-0127

*"Necessity is the Mother of Invention
— and harvesting Buckwheat honey
was the Motivation."*

Using fume boards to drive bees out of honey supers is now a common practice in much of the beekeeping world. The first article about using them was published, I believe, in 1932 in *Gleanings in Bee Culture* and was later written up in *The ABC & XYZ of Beekeeping*. I am still asked how I happened to develop this labor-saving method of taking supers off. As with most things, necessity is the mother of invention and when this idea came to me, it was definitely necessary!

I started keeping bees in 1919. I was 14 at the time, and I kept them in my backyard. But my commercial experience began in 1925 when I worked with N. L. Stevens in Venice Center, NY. This is the Finger Lake area and then was the heart of buckwheat honey country. Stevens kept about 100 colonies in each apiary, along with a small building that held the extracting equipment: one four-frame hand extractor, an uncapping box and a settling tank.

Few beekeepers living today have ever had the experience of taking honey off during the month-long buckwheat flow. It seemed that all the bees turned into "African bees". We took honey off by the "Smoke, shake and brush" method, one comb at a time, placing it into a super on a wheel barrow. When four supers were loaded they were wheeled to the honey house and shoved through an opening in the wall to be extracted.

Buckwheat blossoms produce nectar only in the early part of the day and when the flow stopped in the afternoon the bees went wild. Even though we were covered with jackets, veils, gloves, etc., we could never keep the bees from crawling inside our clothing, all over us.

We were constantly being stung inside our clothing, to the point we became "numb" and did not feel the stings anymore. We were stung hundreds of times every day all through the buckwheat season.

Inside the "honey house" was not much better. It, too, was full of robbing bees and the four-frame extractor, loaded with heavy combs, was cranked by hand. The handle of the sticky crank on the extractor was always covered with robbing bees, too. We soon learned that before grabbing the handle, first give it a spin to remove the bees. Then we had to grab it immediately before it was again covered with bees.

After a few seasons of this, I remembered reading that in England, instead of using smoke, some beekeepers used a spray of phenol, or "carbolic acid" solution to control bees. Apparently they did not like the odor of phenol. This inspired me to try a few experiments to find a better, easier method to take supers off.

On most country farms in those days you could find a jug of crude "car-

bolic acid" used as a disinfectant for animals. One day I took a burlap bag and soaked it in a solution of crude carbolic acid I had found. Then, I placed it on the top of a super of honey to see if it would drive out the bees. In a few minutes the bees went down about half way in the deep hive body but would go no further. I smoked and shook the rest of them off. But a few minutes later, Claude, the boss' son, called out, "Don't use that carbolic acid any more, it tastes awful." He was doing the uncapping then and was constantly eating choice slabs of cappings. That ended phase one of the fume board experiment.

In 1928 I moved to Vermont to work with J. E. Crane and Son in their comb honey business. He was 88 years old at the time. Students of old beekeeping magazines may remember him as the writer of the original *Siftings* column for many years in *Gleanings*. We spent many an hour talking about beekeeping in the "old days", before trucks were invented, when horses were used to haul both bees and supers.

Continued on Page 476

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SIFTINGS . . . from Page 475

All honey produced by Crane & Son at that time was 4-1/4" x 4-1/4" section comb honey. Normally, finished supers were removed using bee escapes, but since the equipment was old and no longer "bee tight", often they were robbed out and empty when we went back a few days later to remove them. During a honey flow we removed finished comb honey supers using smoke. But this didn't work after the honey flow was over because the bees would "nick" the cappings and start removing some of the honey, which spoiled the appearance. After one experience with this I remembered my previous fume board trials at Venice Center three years before. Since comb honey supers are only five inches high, the phenol had cleared the deep super down to about six inches, I knew this would be enough to clear bees out of a shallow comb honey super.

I also reasoned that if I used pure, clean phenol, it might not leave a taste or odor on the honey. So I made up a solution of pure phenol and water and dipped a clean cloth into it. I wrung it out and spread it on top of the comb super with a frame between to prevent the cloth from touching the super.

At first my solution was too weak so I kept making it stronger. I finally got it right, and the bees cleared out of the supers like a charm in just a few minutes. By using three cloths we could take off comb honey supers as fast as we could carry them away, even before the bees could start robbing. One drawback was that dipping the cloths in phenol and wringing them out by hand caused a serious case of "phenol dishpan hands"; it burned my skin and made it numb. To avoid this I fastened the cloth on a frame, and used a metal top over the cloth to hold in the fumes. To "charge" the cloth I simply sprinkled a small amount of phenol on it and let it soak in. The use of fume boards spread rapidly after the *Gleanings* article appeared shortly thereafter.

Over the years I have fine-tuned this technique. I found the most efficient use of phenol was to use the pure solution with only enough water (20%) to dissolve the crystals, and also to add a small amount of glycerine to the solution to prevent it from drying out. When only water was used the solution quickly evaporated, causing phenol crystals to form on the cloth which would flake off and fall in the supers.

Glycerine does not evaporate and keeps the phenol in solution. By this method we could take off 30 tons of honey using less than five pounds of phenol. When not in use, we kept the fume boards "face to face" to prevent evaporation. With just one application of phenol the fume boards were used for several days.

As long as bees keep making surplus honey, fume boards and the new repellants still seem to be the best method to separate the bees from their honey. Taking off a 50-ton buckwheat honey crop 65 years ago by the "smoke, shake and brush" method one comb at a time, is an experience one can never forget. But it did provide the motivation to make things a little better, and a lot easier. □

INNER . . . from Page 436

In fact I'm very interested in who is spoiling my food. But not a word. Not which packer; not, why hasn't somebody been checking up on this packer; not, what's being done about it; not, are there other foods I'm eating that have the same problem. . .

This could have been a dynamite story. But the (maybe) careless remarks of the beekeeper, and the lack of follow-through by the reporter left a sour taste.

Don't let this happen to you. If you've got a bone to pick, make sure you can back it up with facts because you may run into a better reporter. And lawsuits are expensive.

BEE TALK . . . from Page 474

freezer, and that works fine. I never see any wax worm damage in the sections that have been through the freezer.

Why the plastic bag? So that the moisture that condenses as the sections go back to room temperature will be on the outside of the bag, and not on the honey sections themselves. You can get these little plastic trash bags at any grocery store, in various sizes, and they can be used over and over. The cost is insignificant.

I guess it is part of any agricultural pursuit that you have to cope with pests. It irritates me that my life should be made difficult by a contemptible little mite or worm, but on the other hand, for every problem there is somewhere a solution. □

(Comments and questions are welcomed. Use Trumansburg address and, for a prompt response, enclose a stamped envelope; Canadian stamps are okay.)

For Your Information

During a phone call to Dr. Anita Collins, who runs the Weslaco Bee Lab, the conversation turned to, "Well, how long do we have before those bees finally get here?" Actually, I'd bet that nearly every conversation she has eventually turns to that subject. It comes with the job.

Her news was encouraging though. But then she has such infectious enthusiasm that nearly everything she says is encouraging. The inside story is that it will be late 1990, or even 1991 before they arrive. The researchers expect to get their first African swarms starting in March, 1990 in the trapline they run in Mexico, and it should be even longer before the bees cross the border in any measurable numbers. There, how's that for some good news.

It seems that, at least on the gulf side of the country the swarm trapping and destruction, the monitoring and other activities have had some effect on northern migration. The Pacific side has had less satisfactory results because of fewer managed colonies, beekeepers and other problems. Too, the weather has been extremely dry in those areas this year, slowing the march considerably.

This is the kind of news you like to run into once in a while.

Kim Flottum

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DIANA SAMMATARO

Beeswax is why I keep bees. The honey I harvest is only a necessary by-product and I consider it almost a nuisance.

I own five solar wax melters, along with a dozen or so double boilers and have figured out how to make just about every kind of candle you can imagine.

But, the trickiest part of harvesting and using beeswax is that first, crucial step — making a good raw product out of old combs or cappings. After a few years of trying this and that method, I've settled on some general rules that work well for me, and the size of operation I like to run.

• Don't mix wax colors

I found this to be extremely important if you want to produce a quality wax. Separate the older, black and brown combs from the lighter ones, and the cappings. The two easiest ways to extract wax from old combs is to either boil them in a kettle filled with rainwater (or water to which some vinegar has been added) or to put them in a wax melter. You will not get out all the wax either way, but you will get most of it.

Use several wax melters if possible, one for old combs, one for new combs and even one for cappings or previously refined wax. That way you don't have to wait for one, or contaminate a lighter wax.

Research indicates that solar melters work most efficiently if the inside is painted white, the outside black and the metal tray is insulated from below.

Double paned glass, or two glass sheets 1/4 inch apart and 5 inches off the wax is great, but not mandatory. In fact, a sheet of two-mil plastic works in a pinch. But with good glass, proper insulation and coloring, the internal temperatures will reach 130° to 190°F (54° to 88°C). In fact, a well insulated solar extractor will work as late as mid-December, and as early as mid-March here in Ohio.

Collect the melted wax cakes during the afternoon and store to be refined



Put cappings in a five gallon pail and soak in rain water or tap water with a little vinegar added. Stir occasionally so all cappings are under water. Soak for at least 24 hours.

later. Make sure you segregate wax colors, as dark waxes will darken the lighter shades if melted together later. Also, make sure the containers you collect melted wax in are either aluminum, stainless or other non-reactive materials. Some plastics work well, if they can stand the heat.

• Take Care with Cappings

Since cappings wax is the highest grade, treat them with extra care. Cappings are created when the tops of combs are cut during extraction. Depending on the efficiency of your operation, anywhere from 1-2 pounds of wax is harvested for every 15 to 100 pounds of honey. The more efficient your operation the less cappings you will generate. It's definitely a trade-off — low efficiency and lots of cappings, or fast and few. I tend to favor the more cappings/less efficient methods.

Once your cappings have dripped most of the the honey, it is best to spin out what remains. Honey and pollen will damage the cappings if they are not removed quickly. Fermenting action spoils the wax by destroying the wonderful wax aroma. So dry those cappings quickly.

If you can't spin the cappings dry, you may be able to feed them back to your bees by putting them in a miller-type feeder inside the hive. They will usually clean them out in a day or two, leaving clean, flakey wax on the bottom of the feeder. However, if you allow bees to clean your cappings this way make



Drain the water off (save for honey vinegar if you want) and transfer your now-clean cappings to a smaller container. If there is still honey in the wax, you may want to change the water and soak overnight again. This is where patience really pays off, because honey left in the wax can really mess it up later.

sure they are from disease-free colonies.

If neither of these methods work for you, cappings can be cleaned by simply soaking in water. Put the wax in a 5 gallon bucket and fill with soft rainwater or water to which you have added 1 oz. vinegar to each gallon tap water. Soak them overnight and drain. Some beekeepers go on to use this water to make honey vinegar, since the first thing you need for this fine product is a honey and water mixture.

Once the cappings are drained you'll need a wax melting unit. It should be a stainless steel, aluminum or tin pail. You'll also need an open ended pipe fitting (nipple), available in most hardware stores. Punch, cut or burn a hole in the pail, insert the nipple in the hole and fasten it permanently to the pail. Try to make the insertion point about 3/4 of the way up. You can also attach a baffle to the inside if you want.

Set your wax melting unit over heat and add about one inch of water, then add the wax.

Heat sources are only limited by your imagination. You can get as primitive as need be (bricks stacked in the driveway work just fine, thank you), or use a bar-b-que grill, or simply run an extension cord outside and hook-up a hotplate. I recommend that this phase of wax refining be carried out in as easy to clean location as possible. Kitchens are hard to clean, and workshops tend to fill with steam and strange odors, especially if melting old wax. My preference is outside on a cool day in the fall.

Make sure you have two or three pots of water on the same heat source (if possible), and that they are near boiling at all times.

When the wax is melted place a cloth-covered can under the spout and pour boiling water into the large container so the melted wax rises and runs out the spout. Quit adding water when that's all that comes out. You can continue to add cappings to the pail as long as you want. Just make sure you have a good supply of hot water on hand to keep the important one inch on the bottom, and to add later.

Once you have collected and filtered the first batch, pour the wax into cardboard milk cartons to make crude wax cakes. These can be further refined later.

Primitive heat sources work just fine, but any source will do. This was set up in my driveway, and the fuel was simply left-over pieces of wood from a construction project.



Periodically, you may have to use a slotted spoon to scoop debris out of the large container. Once you have committed a kitchen implement to this enterprise, it is lost to the kitchen forever. Remember that just before you ruin a good utensil, not after.

You may be surprised at how much debris there is in even these cappings! Some people put the debris, called slumgum, in their compost pile to decompose. It helps lighten heavy soils when thoroughly composted. Never put it on your garden straight though, since it's highly acidic and can damage plants.

• **Really Refined**

Now that you have your nearly perfect wax in cakes, you can take them to your nearest supplier and sell as is, or you can turn them into a million other



This is the pail mentioned in the article. A hole has been made in the side about three quarters of the way up and a pipe nipple inserted and fastened (welded). A "V" shaped baffle could be added to the inside to make this even more efficient. Put about an inch of water in the pail, then add the cappings.

Summer Prices 1989

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When the wax has melted, add boiling water to raise the level to the spout. The wax will run out into a filtered collecting can. Don't forget to skim off waste material that collects in the wax.



The finished product of the first refining process. The block on the left shows the top, while that on the right shows the bottom, and the waste material that still gets in there. These are ready to take inside and refine further, or are perfect to take to suppliers to trade in.

things. I sell small cakes to carpenters, seamstresses and hobbyists, and I also make candles, ornaments, cosmetics, soap, and use wax for crafts, like batik and Easter egg decoration.

If you are going to refine these cakes further, like I do, you can do it inside, since it is not nearly as messy, and much easier to handle. Besides, it's a great way to spend a blustery winter day.

To remelt, place the cakes, or pieces of wax in pans with water, just like before. If you had your wax in something large, like a milk carton, put them in a freezer for awhile because they are easier to break into useable pieces when cold.

Before doing any remelting though, scrape as much dirty sediment off the bottom as possible. I save this for adding to my dark wax, but there's usually not much.

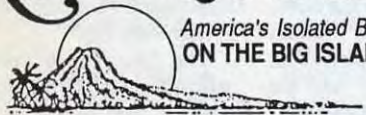
Once melted, pour into another container, using cheesecloth as a course strainer, and a single facial tissue as a fine, and final filter.

When wax will no longer pass through the tissue, simply replace with another. But don't throw it away. These are great for starting fireplaces, smokers, bar-b-ques and for camping trips.

See, wax is my product. Honey just seems to get in the way, even if it pays the bills. □

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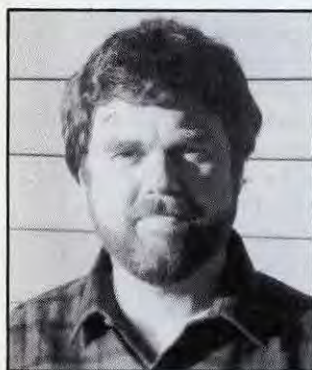
GLEANINGS GLOBE

AUGUST, 1989

ALL THE NEWS THAT FITS

Leaves Ohio Lab

PAGE TO DAVIS



DR. PAGE

COLUMBUS, OH. Dr. Robert Page has accepted a position as Associate Professor of Entomology and Apiculturist at the Uni-

versity of CA, Davis, effective mid-July 1989. He leaves the Ohio State University after three years there in a similar position. His work at OSU included genetic studies in Division of Labor and Kin recognition funded by NSF. Dr. Page will have a \$100,000/year budget at Davis to do genetic research on African honey bees. Ohio State will continue its support of beekeeping and has already begun looking for Page's replacement.

Kim Fondrk, Dr. Page's research technician will also be moving to Davis as a Staff Research Associate to assist in the on-going programs Dr. Page will be studying.

New Position Created

ROBINSON TO ILLINOIS

Also leaving Ohio State University is Dr. Gene Robinson, a post doctorate fellow who has been working with Dr. Page. Dr. Robinson is taking a new position at the University of Illinois studying honey bee biology. He has co-authored two cover stories in *Nature* in the last year, and has won several awards including outstanding student from EAS and MD Beekeepers Assn. He obtained his PhD under Dr. Roger Morse at Cornell in 1986.



DR. ROBINSON

SEND YOUR NEWS TO THE
GLOBE
TODAY!

A Full Week Of Bees!

ABF Meets in Las Vegas

Plans are being made for the annual American Beekeeping Federation Convention, set for Jan. 15-19, in Las Vegas.

The convention headquarters' hotel is the Riviera hotel on the fabled Las Vegas Strip, the newer section of hotels and casinos between downtown Las Vegas and the airport. The ABF convention will be housed in the Riviera's convention center wing. Beekeepers will be able to go from their rooms to the meetings and trade show without walking through the casino, but those so inclined will find the games just a few yards away.

With four big shows and a host of restaurants, including a Burger King, under the Riviera's roof, convention-goers will have little need to seek entertainment elsewhere during the week, but a visit to Las Vegas wouldn't be complete without some casino and hotel-hopping. The Riviera's location on the Strip is ideally

suited for outside excursions. Many shows are within walking distance, and there is convenient public bus service.

The tentative schedule calls for the convention to open on Monday afternoon, Jan. 15, following a director's meeting on Monday morning. The general session will continue on Tuesday, Wednesday and Thursday, with the annual business meeting set for Thursday afternoon. The final director's meeting will be on Friday, Jan. 19.

The Las Vegas convention will include all the regular activities — the American Honey Show, selection of the 1990 American Honey Queen and Princess, the meeting of the ABF Ladies Auxiliary and the annual Trade Show.

For information on the Las Vegas convention, contact the ABF office, P. O. Box 1038, Jesup, GA 31545, ph. (912) 427-8447.

Alar Backlash

GROWERS PROTEST

WASHINGTON - The Washington State Fruit Commission has taken an economic stand against CBS's biased coverage of the Alar Scare Show aired a few months back. In protest the commission pulled over \$70,000 worth of cherry advertising from three CBS stations. Their support, though not significant to media giant CBS, does hurt the three small stations.



Don't Bother To Write

Congress Mail Delayed

WASHINGTON In this Age of Communication, it nevertheless takes 10 days — or longer — to send a letter from the National Press Building to the House of Representatives on Capitol Hill, a distance of little more than a mile.

The House mailroom is so backed up that a million or more pieces of mail must wait a week or longer to be sorted and delivered.

The so-called "ethics crisis" in the House that is commanding headlines these days pales by comparison to the fear congressmen have over the backlogged mail.

Let House Speaker Jim Wright, Democratic whip Tony Coelho and a dozen others resign and the House will carry on quite nicely, thank you. But let a million pieces of mail or 100,000 or a thousand or even a half dozen letters go unanswered for two weeks or more and the very foundation upon which the 99% reelection rate is built is in grave danger. No wonder congressmen are worried.

Rep. Dennis E. Eckart, a Democrat from Mentor, OH, was among the first to see the flood waters of constituent mail rising. He recently issued a press release discreetly titled, "Eckart Reports Mail Delays."

After checking with House Postmaster Robert V. Rota, Eckart reported that constituent mail has more than doubled over last year and, if the present pace continues, will add up to 390 million pieces of mail by year's end. That's almost 900,000 pieces for each member of the House.

"When I'm home, people are coming up to me to ask, 'Why haven't you answered my letter?' " Eckart said in his news release. "The simple truth is that the letter is sitting in the basement of our building waiting to be processed. Once the letter is in my hands, a response goes out promptly."

This has the ring of "The check's in the mail," but it's true. The letters really are sitting in the basement.

All the computerized responses, typed to look like one-of-a-kind, and all the automatic

signature machines in the world don't mean much if the mail is mildewing in the basement.

Rep. Donald J. Pease, a Democrat from Oberlin, OH, has instructed his staff to send all office correspondence and other important mail to his home rather than plunge it into the abyss of the House mailroom.

Pease said his research found that there are about 20 different letter-writing campaigns under way at any one time, with millions of letters and postcards generated for such causes as "notch babies", abortion, gun control and animal rights.

So, there is a real crisis in the House. Naturally, our representatives are sparing no amount of tax dollars to address it. Extra bodies have been hired to try to stem the tide of mail. Yet it continues to seep into the basement like rainwater.

Blueprints are being drawn up to expand the mailroom into a nearby parking lot. Look for some congressman to suggest converting Robert F. Kennedy Stadium into a mailroom. The Redskins only use it a few Sundays a year.

If this sounds far-fetched, expensive and just another way congress has found to spend money — don't put up with it! Write your Congressman — but don't hold your breath waiting for a reply.

(from Cleveland Plain Dealer)

Smart Move

Computer Use Up

Small businesses are broadening their computer applications, according to a study by the Yankee Group, a Boston-based technology-forecasting and market-research firm. For example, more than 70% of small businesses now use electronic mail. The survey also showed that nearly 60% of firms use internal and external data bases, and 45% have developed internally designed software.

BUSINESS BRIEFS:

FOREIGN SALES

A shared foreign sales corporation (FSC) is a state-supported program that enables up to 25 unrelated companies to engage in joint exporting, thereby reducing costs, boosting sales, and saving tax dollars. The state has no ownership in the FSC, but acts as sponsor, providing guidance. The state incurs the cost of developing and operating the program, while exporters incur the cost of joining and maintaining the shared FSC.

Exporters benefit from up to a 15% tax savings on export earnings, as well as lower start-up and operating costs. Each exporter owns a separate class of stock in the FSC and runs its own export business as usual. The application process is fairly simple. Typically, an exporter needs only to submit limited financial information to a manager who has been hired by the FSC.

States most active in establishing shared FSC's include Colorado, Illinois, Michigan, New York, Ohio and Virginia.

SALES PROMOTION

Sales promotions increasingly account for larger portions of marketing budgets, according to a survey by *Marketing Communication* magazine. In the past decade, sales promotion budgets have increased an average of 13% annually and now make up 65% of the total promotion/advertising budget. In contrast, advertising budgets have increased only 10% annually and now account for 35 cents of each dollar spent on marketing, down from 42 cents in 1977.

Among specific sales promotions, meetings and conventions constitute 14% of total promotion/advertising spending. Direct mail and telemarketing each make up 11%; premiums and incentives, 8%; promotional advertising space and point-of-purchase displays, each 6%; trade shows and exhibits, 4%; and coupon redemption, 3%.

Among the different forms of media advertising, newspapers and television topped the list each making up 13% of the promotion/advertising budget. These were followed by radio, 4%; and consumer magazines, 3%.

CONTRACT PROBLEMS

The Uniform Commercial Code says a seller is in breach of a sales contract when any one of the following events occur:

- The seller informs the buyer that goods will not be delivered on time.
- The seller fails to deliver the goods altogether.
- Goods delivered are defective and the buyer rejects them on sight.
- The seller delivers defective goods and the buyer rejects them at a later date when the defect is discovered.

In these situations, the buyer has several alternatives:

1. Cancel the sales contract.
2. Buy the goods in the marketplace and, if prices are higher than the original contract, collect the difference from the first seller.
3. Recover damages based on the difference between the contract price and the market price at the time the buyer learned of the breach.
4. If the seller refuses to deliver available goods, and the items cannot be bought from other vendors, the buyer can obtain a court order to force delivery of the items.
5. If the seller is insolvent, the buyer can recover any paid-for goods that have been set aside for the buyer.

SEND NOTICES TO B. CULTURE CALENDAR!



A new beekeeping magazine made its debut in May in Guadalajara, Mexico. It is *Apicultura Moderna*, or Modern Beekeeping, published by a group of students and friends at the University of Guadalajara. The first issue of 36 pages contains a diverse mixture of interesting topics, from science to a children's coloring page, and from queens to cooking.

Apicultura Moderna will be published in January, May, and September. Single copies are 3,500 pesos or about \$1.50. For information or submission of manuscripts, contact Instituto de Investigacion Apicola de Mexico, A. C., Apartado Postal 5-885, Guadalajara, Jalisco, 45000 Mexico. The group hopes the magazine will help to improve beekeeping in Mexico. They will use any profits to support graduate studies in apiculture. The magazine is in Spanish.

Bronze Forager Robo Bee

Bees tell each other where to find nectar by performing a "waggle dance". The orientation of a bee's dance indicates the direction of a feeding area, while the duration represents distance.

European researchers have built a bronze robot bee to study details of this communication dance, *Scientific American* reports. Each second, the computer-controlled bee beats its wings 250 times and waggles its rear end 15 times. It even dispenses sugar water from its mouth like a real bee. In Wurzburg, West Germany, the scientists put the robot in a hive and programmed it to dance directions to a specific place. Sure enough, real bees flew to that area.



Pam Neal, Cattleman's Assoc.; Ed Lusby, Beekeepers Assn.; Al Lopey, Veg. Growers; A. Duncan, Veg. Growers; Rick Lavis, Cotton Growers; Dr. Ivan Shields, Az. Ag. & Hort.; N. Partington, Veg. Growers; G. Ward, Ag. Business Council; and seated, Gov. Mofford.

Arizona Governor Mofford signs into law the formation of a director driver Dept. of Agriculture, after 20 years debate among the states commodity groups. Eighteen groups and associations are represented in the compromise bill with only the Farm Bureau

dissenting. The Governor will appoint a nominating committee by January 1990 who will submit selection for the new director and the new Dept. of Ag's Advisory Council. This process will be complete by January 1991.

TAX BRIEFS

The IRS recently held that five types of costs are generally considered qualified research expenditures for purposes of computing the R&D credit:

1. Costs incurred for wages and supplies for laboratory testing of a prototype.
2. Costs incurred conducting follow-up testing and making extensive modifications to a prototype, both in the laboratory and at the work site.
3. The costs of on-site monitoring activities incidental to the development or improvement of a plant process, a product, or similar property. These include costs incurred to evaluate empirical data.

4. The costs of materials for modifying the prototype.
5. The cost of replacing materials damaged during the testing of a prototype.

The IRS stated that at some point during R&D testing, a taxpayer must reach a stage where it has done enough modifications and has a completed prototype that meets its basic design specifications. From that point on, the taxpayer is no longer developing the concept of a product or conducting research in the experimental or laboratory sense. Expenses incurred after that time fall outside the definition of qualified research and are not eligible for the R&D credit.

DATES TO KNOW

The following are important tax dates to remember for the balance of 1989:

August 15. Deadline for filing Form 1040 for taxpayers who took the automatic four month extension.

September 15. Deadline for estimated taxes for individuals and calendar-year corporations;

deadline for calendar-year corporations obtaining an extension. **October 31.** Deadline for filing Form 941 for FICA and withheld income taxes for July, August, and September.

December 15. Deadline for depositing corporate estimated taxes by calendar-year corporations.

Court Cases Increasing

LIABILITY COVERAGE
BEING QUESTIONED

BE PREPARED

LAWSUIT ADVICE

When an incident occurs that could lead to a criminal charge or lawsuit, *immediately* write down what occurred. Document the way the situation was handled from start to finish, including the timing and sequence of events. If called on to testify about the incident, be prepared — or you may make costly mistakes on the witness stand.

On the stand, remember: The way you conduct yourself will influence the outcome of the case. Maintain poise and control. Listen carefully to the questions and give answers carefully. Take your time. Too hasty a reply suggests you rehearsed, and lessens your credibility in the minds of the jurists.

Other suggestions:

- Never volunteer information. If you're asked repeatedly about details you don't clearly recall, simply say "I do not recall" or qualify your answer by saying "that is all I remember at this time."
- If asked two or more questions in a row, politely ask the attorney to identify which question you are to answer first.
- Don't be drawn into matching wits with opposing attorneys.
- Do not take attacks by opposing attorneys personally.
- Don't worry about facts being muddled during cross-examinations. Your attorney will have an opportunity to clarify and correct your testimony.

TAX BOOK FREE

The IRS offers a free listing of publications and other information sources for tax-related services. To obtain your copy of the *Guide to Free Tax Services*, call 1-800-424-3676 and ask for publication 910.



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