Bee Culture

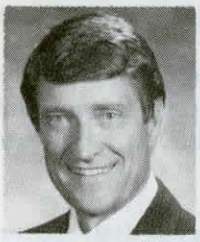
AUGUST 1994

INSIDE IN AUGUST

Augu

COLUMNS

DEPARTMENTS



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VOL 122 ⬡ NO 8

st '94

Banana Frothy

1 banana
2 tablespoons honey (light & mild)
1 cup milk
2 tablespoons orange juice

Combine all ingredients in the container of an electric blender; process mixture until frothy. Serve immediately. Serves two.

FEATURES

HONEY

Steal this page. Copy and distribute. The more *good* information you can get in consumer's hands the better.
447

Cowen Manufacturing Reaches 25

25 years ago John Cowen had a good idea, and beekeepers around the world have put that idea to use for a quarter century.
(by Kim Flottum)
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Cowen Mfg.
Pg. 448

The Bottom Line

Bottom Line research, that which contributes directly to a beekeeper's profit or loss, can still be done. Some examples show how.
(by Mark Winston)
465

Cover

Butterfly weed, a close cousin to the common Milkweed is a perennial garden flower that attracts both butterflys and honey bees. And, it lends an uncommon color to any garden.
photo by Larry Goltz

Shaking & Brushing

This is the most fundamental means of removing honey there is, used by the vast majority of beekeepers. But with a few tips, it can be even easier than you thought.
(by Richard Bonney)
470

The African Experience

• Dr. David DeJong reports on the progress Brazilian beekeepers have made after nearly 40 years experience with African bees. His experience, and insights are revealing.
453

• Dr. Roger Morse looks at beekeeping in Brazil today, with an eye on how it compares and contrasts to beekeeping in the U.S. Much is the same and can be expected to remain so, given the right precautions.
453

• Jeff Siggins, a freelance writer offers a different perspective from the front lines in Mexico. There, beekeepers are still trying to keep things the same as before. The philosophy is the same in the U.S. The results in Mexico should be telling.
454

Shaking & Brushing
Pg. 470

INNER COVER

In early May I was neatening up a beeyard close to home and finished by stacking three drawn but empty deeps on top of a strong, two-deep colony. I put them there to store and let the bees keep clean rather than in my garage and let the wax moth feast.

A month later I was in the yard again and needed one of those deeps. I walked over to the pile, and reached for the top one which, I assumed, was still empty and should weigh about 20-25 pounds. I grabbed the super, it was about eyeball high, turned and started to walk away. My body and part of my shoulder did anyway. My hand didn't move however, because that strong colony had filled those three deeps right to the top with locust honey. A wonderful crop and lots of it. But meanwhile my body and part of my shoulder are still walking away while my hand isn't moving that 90+ pound super one single millimeter.

The result was painful. And damaging. In fact it's still painful and the damage hasn't healed even yet. Pinched nerves, twisted vertebrae you get the picture (speaking of pictures, do you know how much x-rays cost nowadays?).

I relate these events not to gain sympathy (though any offered will be gladly accepted), but to serve as yet another warning of activities not to do in a beeyard or whenever lifting, turning, twisting, hauling or moving things heavy.

We're not as young as we used to be, no matter how young we feel or how good shape we're in (or think we're in). And, this is the season of lifting and twisting and turning and working – and this is when most injuries occur in our business.

Nor is this a lecture on how to lift, how to shove and pull and move, and all the other ergonomically correct (E.C.?) things you should do. You already know them. This is a friendly reminder to *DO THEM* this year.

I, on the other hand, don't have to. Nope, I won't be lifting or twisting or turning any honey supers this season. No way. Actually, no way I could. Rather, I will, on those hot, sticky days, be sitting on my front porch, sipping a (purely medicinal) cool, wet something or other, nursing a still very sore shoulder.

If you'd like to hear all the gory details, stop by. I'll bring you up to date and swap a little of that cool, wet medicinal stuff for some real, heartfelt sympathy. Call first though, I may be resting.

•

Watching what's going to happen in the honey industry from now to February or so is going to be like watching a car wreck in slow motion. You know it's going to happen, and it might be bad, or not, but you won't find out till the dust settles, at the end, when it's all over and done and finished.

No subsidy for the big guys. No relief from Chinese honey imports. Big money spent on the ITC thing that didn't work. More big money needed to seek out anti-dumping claims. A bumper honey crop all across the country (wonderful reports from just *everywhere* so far) that could top 220 MM pounds. There's a loan program, but you can't sell honey for more than the loan – nobody's paying that much. Major defaults? Some defaults? Business as usual?

See, it's like a slow motion car wreck. We just don't know how it will turn out. Fasten your seat belts.

•

On a far more cheerful note, in late June Walter and Claire Rothenbuhler celebrated their Golden Wedding Anniversary. Quite a feat, that.

Since moving to Ohio I've had the pleasure of getting to know these fine folks. It's reassuring that very famous people can also be very nice people. That's not always the case you know.

They had a party at their house on a Saturday afternoon. A couple hundred friends and family came and ate good food and sang old songs and listened to 50 years of stories from those who know. It was fun. I hope I get the chance to have a party like that in another 40 or so years.

Congratulations Claire and Walter. And thanks.

Kim Flottum

Painful Results

Reader Assistance

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Circle Appropriate Months: J F M A M J J A S O N D

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We encourage letters to the editor on any subject whether appearing in the magazine or not. Direct your letters to: Editor, P.O. Box 706, Medina, OH 44258. We reserve the right to edit letters for content and length, but will avoid this if possible.

Coming Soon

The next few months will be exciting here at *Bee Culture*, with hundreds of good ideas and articles and more just waiting.

We'll start early next spring with a 12-month series on observation hives. These are without doubt the best promotional devices we have – bar none! But the trouble is, what can you do besides lugging it to schools and fairs and meetings, and looking at one in the nearest Nature Center or Museum?

Well, each month we'll present two sides to Observation Hive How-To. First, there'll be a How-To-Take-Care-Of-It section that corresponds to *your* season – not January (winter up north, early spring in the south). That way you'll be in step, no matter what time of year it is. Second, there'll be projects and ideas and learning events you can use when you lug that hive to schools and fairs and where ever. This first-of-a-kind series will put you, and your observation hive right where you want, when you want – don't miss even one of these.

But there's more, for sure. Marketing honey is going to be even more competitive in the future, and developing your own special market is going to be critical. Next month we start off (don't forget September is National Honey Month) with some great ideas on how you can increase *your* market share, without *any* added expense in advertising or promotion.

But coming up are also pieces on innovative inspection programs, the closure of the Canadian Border, disease and mite resistance, more with kids and an absolutely *Super* Boy Scout program that you can copy with *your* local troop.

So stay tuned. *Bee Culture* is just beginning to heat up!

A. Reader
530 W. Mill St.
Medina, OH 44256

29¢

The Editor
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Medina, OH 44256

MAILBOX

WAS Canceled

It is with much regret that I inform you that due to unfortunate circumstances and continued delays over which we had no control and following consultation with the WAS Executive Board, we have canceled the 1994 WAS Conference scheduled for August 1-5, 1994 in Pullman, Washington.

The purpose of the conference is to meet the education and other needs of the members of the Society. With the continued delays we have not been able to give our members sufficient time to look at conference material and plan their travel and budgets. Without these opportunities the conference may not be attended as well as we would like which would put undue hardship on those able to be with us and possibly negatively affect the WAS budget. We do not want this to occur! Therefore we made the decision to cancel the 1994 WAS conference. We regret this circumstance.

James C. Bach
WAS President

Easy Move!

Regarding Russel Willsey's question on how to move five beehives a distance of 60 feet, we experimented successfully with a new technique. Rather than taking the hives two miles away, waiting a few days and then moving them to the new location across the yard, we succeeded with the following approach.

We readied the new hive site about 50 feet away well in advance of the move. Note that it was not in direct line of sight from the original location. Using a new bottom board at the new location we left the original bottom board at the original sight to provide pheromone identification for field bees returning from work.

Next we "connected" the old hive location to the new hive location by means of a staunch rope. The bees soon figured out that the two sights were "connected" by the rope and once early foragers and had followed the rope, around two corners, to the new hive, scouts led the way all day long to lead field bees back home.

We had thought to spray the rope with a very diluted sugar/water or honey/water solution, but in fact we never did this and found no need to consider doing it in the future.

Now if I could only figure out how to keep the bees out of my hot tub!

Michael J. Soudant
Lafayette, CO

Royal Misrepresentation?

If ever there was a case of blatant bias it is evident in "Royal Jelly Implicated," *Bee Culture*, May 1994 p 312.

The Center for Science in the Public Interest (CSPI) should more properly be labeled the Center for Science in (its own) Political (self) Interest. CSPI's claim that it " is supported by 700,000 subscribers " does not carry much weight in the knowledgeable world, for it appears that the subscriber list figure is highly inflated, and according to reports is about 20% of their claim, many having become aware of their misplaced trust and dropped out because they don't approve of Bruce Silverglade's agenda.

And who is Bruce Silverglade? Silverglade is CSPI's neoprohibitionist director, a careerist who craves to put the supplements and natural foods industries out of existence.

Under Silverglade, CSPI has become a lackey of the Food and Drug Administration (FDA). Spouting their lines with alacrity Silverglade, using the CSPI as a vehicle to propel him toward his goal, has put himself in a position for the pharmaceutical industry's support to become head of the FDA, to replace Dr. David Kessler who *Forbes* magazine, November 22, 1993 depicted as a Napoleonic dictator distrustful of free markets. By reciprocal support, the FDA would relabel supplements as drugs – then allow the pharmaceutical industry to charge Rx prices for the same supplements which they would then tout as beneficial, but which they now label as toxic and dangerous.

This is yet another attack by CSPI on the natural foods and supplement – vitamins, minerals, herbs, and amino acids – industries which are supported by more than 130 million users, over half this nation's population.

This CSPI jumps on every microscopic opportunity to back the FDA and the pharmaceuticals when something threatens the power or purse of either or both. But when prescription drugs cause a number of deaths or severe and adverse side effects that add up to a possible 2.0 percent then "that is insignificant." Or "think of all the people it does help." (Read, who haven't become aware of, or succumbed to, the side effects yet.) A convenient double standard.

As only e pluribus unum cases, consider the recent news flap about movie theater popcorn causing a rise in cholesterol because it is popped in coconut oil. Natives of the islands whose only source of oil is coconut have thrived on it for centuries, and they have a exceedingly low rate of heart disease.

What does the CSPI suggest as a substitute for coconut oil? The hazardous trans fatty acid-loaded hydrogenated (poisoned) oils.

Time magazine, May 30, 1994 page 20, has this to say: Trans fatty acids found in margarine and foods with partly hydrogenated oils, could be responsible for 30,000 deaths a year from heart disease, scientists say. The acids raise levels of "bad" cholesterol and lower

Continued on Next page

levels of "good" cholesterol.

Contrast this effect in healthy individuals with one death and nine asthmatic attacks presumed to be caused by pollen in persons already predisposed by genetics or other health conditions.

Anyone who knows anything about the human body and its proper nutrition will stick with natural substances like bee pollen, royal jelly, propolis, and butter. They will avoid substances reprocessed into, or even containing something unnatural such as partially hydrogenated oils, which process (hydrogenation) produces trans-fatty acids but has the blessings of the FDA and its sycophant CSPI.

The few drops of royal jelly or spoonful of pollen one takes as a dietary supplement, or several bags of popcorn one might consume in a movie theater over the course of a year, will do no harm and in any event are certainly less toxic than the long term daily intake, even in small quantities, of hydrogenated oils and margarine.

The greatest dangers to the public's health are David Kessler's FDA and Bruce Silverglade's CSPI.

L. Edwin Rybak
Easton, PA

Soapy Water Kills Fire Ants, Too

Some time ago I read an article in your magazine stating that a solution of detergent used as a spray would destroy an unwanted hive of bees.

In my area, fire ants are a real problem. Knowing that fire ants, like honey bees, are *hymenoptera*, sp., I wondered if a detergent solution would kill fire ants as well as honey bees.

It will.

My technique is to put 1/2 cup of *liquid* dish detergent (not soap) in a 2 gallon watering can with a sprinkling head on the spot. Fill with water being careful to avoid too much foam, but mixing well. Apply when the soil is fairly dry – not immediately after a rain. Use about one gallon to sprinkle around the base of the "hill" and the hill itself, beginning about a foot away from the hill as the tunnels extend beyond the area covered by the "hill." Then "drizzle" as much of the solution into these holes as possible with minimal runoff. The objective is to get to as many ants as possible, including the queen(s). That's all there is to it. The ants die within 10 - 15 seconds!

You may be disappointed to see ant activity at the mound for a day or two after the "drenching." Close inspection will probably reveal that they are not fire ants but smaller common ants. I suspect they are "robbing out" the nest. The detergent does not seem to bother them. Several months later, you may discover that there is another colony of fire ants in or close to the site. It might be that whatever attracted the first colony is still there and has attracted a second colony. I have not noticed any harm to grass or any plant that was on the treated area.

MAILBOX

I wrote about this technique in our local county weekly paper and received a number of letters from readers saying that indeed it had worked for them. They expressed their gratitude for the information.

One of the letters was from an entomologist at a local agricultural experiment station. He confirmed that this drench was highly effective against fire ants. He encouraged its use as a highly effective, non-hazardous and biodegradable agent. he explained that *hymenoptera* were covered with a waxy substance that was dissolved by the detergent and the insect was desiccated within 10 - 15 seconds. I assume that the waxy substance acts in the same capacity as our skin which, when intact, prevents *our* being desiccated.

I would be interested in hearing from any of your readers that try this. It may be that a more diluted solution or a different technique would work just as well.

I enjoy your magazine very much. I have been a very amateur beekeeper for about ten years and find it to be a very, very satisfying hobby. I don't believe it is possible to learn all about it but I like to try to learn as much as I can.

Michael C. Watson, M.D.
Bamberg, SC

Getting Pollen Supplements

In your May 1994 issue Mark Winston wrote an article on pollen supplements. Mark indicated in that article that since pollen mixed with the pollen supplement may pose a risk of disease transmission then synthetic attractants derived from natural attractants would be very useful in supplement formulations.

Is this synthetic attractant "Fruit Boost" from Phero Tech Inc., 7572 Progress Way, Delta B.C. V4G 1E9 or some other product? And how do we acquire it?

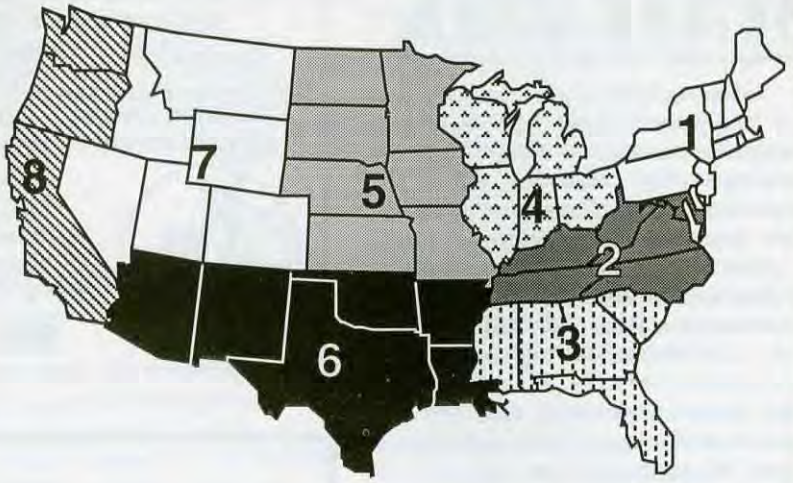
Steven M. Wills
414 Index Pl. NE
Renton, WA 98056

AUGUST Honey Report

August 1, 1994

REPORT FEATURES

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



	Reporting Regions								Summary		History	
	1	2	3	4	5	6	7	8			Last	Last
Extracted honey sold bulk to Packers or Processors									Range	Avg.	Month	Yr.
Wholesale Bulk												
60# Light	45.61	42.00	41.53	42.00	43.15	27.00	42.00	36.33	27.00-56.00	41.58	45.75	43.76
60# Amber	44.19	41.84	33.00	40.80	50.63	25.20	40.00	30.73	21.00-60.00	39.81	43.49	40.47
55 gal. Light	0.55	0.60	0.50	0.64	0.53	0.45	0.52	0.51	0.45-0.90	0.57	0.58	.536
55 gal. Amber	0.49	0.60	0.44	0.55	0.52	0.42	0.50	0.42	0.33-0.78	0.53	0.53	.508
Wholesale - Case Lots												
1/2# 24's	23.53	24.78	27.15	21.60	27.95	26.30	22.50	20.62	18.00-36.30	24.61	20.90	21.18
1# 24's	29.87	32.08	29.35	32.00	30.63	30.00	29.75	30.10	24.00-38.40	31.10	30.95	29.39
2# 12's	30.79	30.20	36.90	36.91	28.38	36.91	28.75	28.50	26.75-52.30	31.67	28.50	27.32
12 oz. Plas. 24's	26.87	29.65	24.33	29.58	25.75	24.00	27.50	25.20	22.80-37.90	28.04	27.45	25.94
5# 6's	28.88	30.08	31.67	31.23	26.13	31.23	27.75	30.30	25.00-38.00	30.69	30.07	28.61
Retail Honey Prices												
1/2#	1.46	2.30	1.05	1.95	1.39	1.34	1.10	1.22	0.90-3.50	1.46	1.35	1.16
12 oz. Plastic	1.51	1.73	1.68	1.52	1.38	1.39	1.50	1.42	0.99-2.00	1.58	1.62	1.54
1 lb. Glass	1.72	1.92	1.69	1.80	1.71	1.79	1.85	1.74	1.35-2.25	1.79	1.83	1.73
2 lb. Glass	3.01	3.43	3.32	2.92	2.67	2.89	2.95	2.92	1.59-3.99	3.19	3.13	3.05
3 lb. Glass	4.16	4.73	5.10	4.30	3.45	4.19	4.35	4.67	2.79-5.69	4.42	4.41	4.24
4 lb. Glass	5.27	5.47	5.50	5.93	5.10	4.69	4.95	5.93	4.69-7.40	5.69	5.55	5.28
5 lb. Glass	6.46	6.85	6.55	7.21	6.05	5.89	5.95	6.27	5.89-8.95	6.79	6.87	6.41
1# Cream	2.65	2.23	3.45	3.45	3.18	2.89	2.10	1.97	1.69-5.99	2.68	2.37	2.21
1# Comb	2.70	2.73	2.75	2.93	2.78	4.00	3.50	3.05	1.95-4.00	2.85	2.90	2.93
Round Plastic	2.64	2.75	2.89	2.94	2.99	4.00	2.94	2.75	1.99-4.00	2.84	2.66	2.67
Wax (Light)	1.69	1.15	2.14	2.23	1.48	1.50	1.20	1.40	1.00-4.00	1.69	1.85	1.69
Wax (Dark)	1.24	1.05	1.18	1.65	1.18	1.00	1.10	1.18	0.95-2.75	1.25	1.35	1.29
Poll. Fee/Col.	28.88	25.00	27.50	32.50	15.00	20.00	35.00	32.00	15.00-55.00	30.07	31.00	28.20

MARKET SHARE

If all holds it should be a bumper crop this year of varietal and wild flower honey. 210MM to 220MM lbs. is anticipated. This, plus cheaper imports will put lots of honey on the market – at fire sale prices in some locations. To insure *your* market, and market share provide *Service, Service, Service*, plus a unique crop, good labels, clean jars and a fair price.

Region 1

Crop appears to be average to a bit above average this season. Clover, tulip poplar and wild flower are major crops. Extraction of the new crop has already begun, but won't finish until late September or October. Market prospects generally good.

Region 2

Above average production this season, with clover and tulip poplar leading the way, but specialty crops like sourwood close behind. Extraction will finish by mid-August for most, and demand for new crop strong and increasing.

Region 3

Production overall about average, but some areas strong, while others weak – a mixed bag. Summer crops include sumac, cotton, wildflower with some spring crops – berry and red gum already harvested. Market prospects mixed, with local outlets strong, but major outlets in strong competition with imports.

Region 4

Production average to way above average, especially early crops. Clovers – yellow, white and dutch main crops, with lots of wildflower. Markets at local scene strong but lots of major brand competition.

Region 5

Strong production area this year. Good crops of basswood, clover, alfalfa and wildflower. Extraction should finish late, to catch late crops – September - November. Market strong, but lots of major brand competition.

Region 6

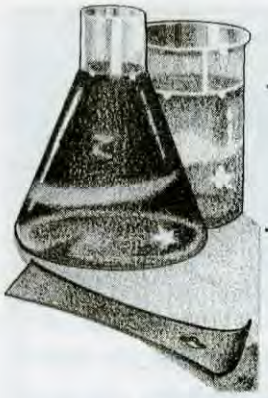
Average to a bit above average crop predicted this year, but some flowers not finished yet. Extraction of early crops – mesquite – already completed by many, while later crops won't come off till November or so. Market mixed, local sellers doing O.K., but major producers facing stiff price competition from imports.

Region 7

Production average to above average for the region this season with clover the main crop but wild flower certainly close behind. Extraction will be complete from now to November. Markets are strong, but imports are gaining.

Region 8

Production not yet determined in most places, but early crops doing well. Extraction complete in some areas, and won't be finished in more southern parts of California. Markets strong on local level, but imports very, very visible.



RESEARCH REVIEW

roger morse cornell university ithaca ny

"What color should hives be painted?"

Tests conducted in Louisiana in May through early August showed that bees in hives painted white had more brood and produced more honey than those in dark, unpainted hives. The colonies were in direct sunlight. However, the focus of this research was not honey production but tracheal mite control. And, interestingly, the darker hives had fewer mites!

Records were kept of the temperatures inside the test colonies. The darker hives were warmer. During the day the maximum temperatures in the space between the brood combs in the dark and white hives were 113°F and 100°F respectively. It is concluded that while the higher temperatures in the dark hives killed some brood, it also killed many mites. At night, the temperatures in the white and dark hives were the same.

Laboratory tests reported in this same paper showed that mature and immature mites were killed in small groups of bees held for six hours at temperatures between 102 and 107°F without harming the bees. Higher temperatures are more effective but also have adverse effects on the bees.

What to do? Fifty years ago I think most beekeepers painted their hives white. The thought was to help the bees keep the hive cool during hot weather. I think the message in this research is that more honey will be produced in the southern states in white hives. In the north, painting hives that are exposed to full sunlight darker colors might be of benefit in mite control; however, there are no data on that point for us Yankees.

Foraging Made Efficient

There is a caste system in a honey bee colony. Foragers, which are one caste, specialize in food collection but they give the nectar they collect to house bees, a second caste, that process and store the food. In social animals this type of specialization is favored but how does it work? These two systems, foraging and processing, must be coordinated. If there is no coordination there may be an accumulation and a waste of unprocessed food or the bees may fail to exploit a good food source fully.

The researchers below created and tested a mathematical model to explain how these two castes work together. The field studies confirmed that the controlling factor between these two groups of bees is the amount of time a forager must spend to find a food-processing bee. In other words, the search time necessary for a forager to find a house bee is the key. If the search time is short then foragers are stimulated to perform waggle dances and to recruit more bees to the food source. If the search time is long, for example, because the hive is already plugged with honey, then the foragers are discouraged from dancing.

> ". . . search time inside determines search time outside."

It is suggested this same balance is used by water-collecting and water-processing bees when water is needed to cool the hive. This is a good example of simple processes that regulate colony life.

Bee Disease Control

In my part of New York State April, May and the first half of June this year were some of the best months for honey bees I have seen in several years. Some colonies brought up from Florida gained 50 pounds during this time from nectar gathered from dandelions, fruit bloom and yellow rocket. How can this be in light of all of the new diseases we are forced to cope with in this country?

Heath's editorial (see below) points out that many of the organisms that cause disease are present in most colonies most of the time. However, disease does not show itself until conditions are right for its development. Chalkbrood fungus can be cultured from almost any colony even though larvae dead from the disease cannot be found. Here at Cornell we can easily find American foulbrood spores in stored food in colonies with no signs of the disease. Young queens and good honey flows do much to slow diseases.

The editorial states that we are using 1890s methods to control disease in the 1990s. While that statement may be a bit extreme it serves to emphasize that we have not changed our approach to disease control very much. The emphasis has been on colony destruction and quarantine. We need new concepts. Restricting the movement of colonies does not necessarily control disease.

My personal view is that we need an expanded educational program with more guidance from apiary inspectors concerning the proper use of chemicals, disease resistant bees and management techniques for disease control. BC

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? DO YOU KNOW ?

Removing Honey

clarence collison

Removal of honey from colonies, extraction, handling wax cappings, processing and packing honey are routinely done in the fall, as beekeepers prepare their colonies for winter. In order to produce a high quality product, it is important to handle the honey crop properly and be familiar with the factors that affect quality.

Please take a few minutes and answer the following questions to determine how well you understand this important topic.

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

1. ___ A brand melter is used to reliquefy crystallized honey stored in bulk containers (plastic buckets, 60 lb. tins and barrels).

2. ___ The most efficient time to reduce the moisture content of honey is after it has been extracted from the combs.

3. ___ U.S. Grade A honey cannot contain more than 18.6% moisture.

4. ___ Froth on the honey surface when you open a jar of honey is the first indication of fermentation.

5. ___ In packing chunk honey, the sections of comb are surrounded by unheated, liquid honey from the same source.

6. ___ A honey extractor uses gravitational force to spin the honey from the cells.

7 ___ Cracking and shrinkage of beeswax is an indication that the wax was overheated during rendering.

Multiple Choice Questions (1 point each)

8. ___ Honey combs should be _____capped before they are removed from the colony for extraction.
   - A. 100%
   - B. 75%
   - C. 30%
   - D. 60%
   - E. 45%

9. ___ The moisture content of honey is determined with a ___.
   - A. Polariscope
   - B. Pfund Grader
   - C. Refractometer
   - D. Honey Comparator
   - E. Hydrometer

10. If an individual has lint (cotton fibers) in their extracted honey, what is the likely source of these fibers? (1 point)

11. Name two ways beekeepers remove wax and other impurities added to honey during the extraction process. (2 points)

12. Name three ways to remove bees from honey supers as they are being removed from colonies for extraction. (3 points)

13. When consumers request "raw honey" what do they expect? (2 points)

14. Give two reasons for heating honey after it has been extracted. (2 points)

15. Name the three basic honey extractor designs. (3 points)

16. Why is it important to turn the extractor slowly at first during the extraction process. (1 point)

17 Name two different ways that beekeepers remove the cappings from honey combs.

Answers on Page 474

HONEY

Honey is the most useful ingredient you can have in your kitchen. Although you may think of honey as a sweetener, honey not only adds flavor but also enhances the flavor of the dish you are preparing.

Try substituting honey for sugar – in equal parts – in your favorite recipes for:

beverages
salad dressings
barbecue sauces
marinades
sweet-sour sauces
yeast breads
fruit pies • cookies
fresh fruits

FLAVORS

The many flavors and colors of honey are determined by the different blossoms visited by the honey bees. Honey ranges from almost water-white to very dark amber. In general, the light colors have mild flavors while the darker honeys are rich and robust. Try several flavors of honey to discover your favorite ones.

CRYSTALIZE

Honey does not spoil. However, it will naturally crystallize or granulate. If this happens, place the opened jar in a bowl of hot water until the honey becomes liquid again. Never put honey in the refrigerator because that will hasten the crystallization. Honey belongs on your kitchen counter where you can easily use it daily.

FORMS

Honey can be found in several forms: the liquid or extracted honey, honey in the comb and creamed or honey spread. Liquid and creamed honey can be used interchangeably for all purposes. Comb honey is delicious on hot biscuits and can also be eaten as a candy treat. The wax can be chewed like chewing gum.

WHAT IS IT?

Honey is considered "instant energy" since it contains the simple sugars of glucose and fructose. It's about 17% water. Vitamins, minerals and some enzymes are present in trace amounts. Honey holds moisture so baked goods stay moist and fresh longer than when cooked with sugar.

USING HONEY HINTS

- a one-pound jar of honey is 1¼ standard measuring cups
- 1 12-ounce squeeze bear is one standard measuring cup
- coat measuring cups and spoons with oil for easy removal of honey
- flexible "bowl scrapers" are helpful when measuring honey
- slightly warmed honey is easier to measure and mix
- for long-term storage of honey, keep in freezer (not in refrigerator)
- honey and shortening cream together easily and quickly
- to sweeten chilled beverages such as lemonade and iced tea, use honey for easy mixing

FAVORITES

Banana Frothy

An excellent way to use bananas.

1 banana
2 tablespoons honey (light and mild)
1 cup milk
2 tablespoons orange juice

Combine all ingredients in the container of an electric blender; process mixture until frothy. Serve immediately. Serves two.

A Honey Cook Book
The A.I. Root Co.

Honey Lemon Dressing

This dressing adds zest to mixed greens or a seafood salad.

1/4 cup honey
3 tablespoons lemon juice
2 tablespoons vegetable oil
1/2 teaspoon dried basil, crushed
salt and pepper to taste

Whisk together all ingredients in small bowl until blended. Makes about 1/2 cup.

Sweetened With Honey The Natural Way
The National Honey Board

Candied Sweet Potatoes

For holidays, or any day.

6 sweet potatoes, cooked & peeled
1/4 cup butter or margarine
1/2 cup honey (use a light and mild variety, like alfalfa or clover)
1/2 cup orange juice
1/4 teaspoon cinnamon (optional)

Arrange sliced sweet potatoes in a buttered baking dish. Combine the melted butter, honey and orange juice and pour over sweet potatoes. Bake at 350° for 20 minutes. Adding the cinnamon to the orange juice will be a delightful surprise to an old favorite.

A Honey Cook Book
The A.I. Root Co.

Orange Ham Glaze

The ham glaze.

1 cup honey (try citrus or orange blossom honey)
1/2 cup orange juice
1/2 teaspoon allspice
1/2 teaspoon ground cloves

Bake ham as desired, and baste with glaze several times during the last 30 minutes of baking. Let ham sit for 15 minutes before serving, basting once or twice while cooling and firming.

A Honey Cook Book
The A.I. Root Co.

Honey should not be fed to infants under one year of age. Honey is safe and wholesome for older children and adults.

Use Honey Every Day – And Say "Thank You" To A Honey Bee

COWEN MANUFACTURING CELEBRATES 25TH

kim flottum

In 1966 John Cowen, his son Dave and his family moved their 3000 colonies from the Imperial Valley in California to Parowan, Utah. Parowan is located in the southwest corner of the state, on highway 15, which comes from Salt Lake City in the north and heads south to Las Vegas and on to southern California. To the east of Parowan is Dixie National Forest and Zion National Park, and directly west is the Escalante Desert. Parowan sits on these edges – parks and desert, north and south, and The Cowens brought their bee business there.

The business was called Parowan Honey Company but colonies were moved to California each year for honey and pollination business. It was definitely a family affair like so many in this industry, with everyone involved.

Running this many colonies obviously produced honey – lots of honey. The uncapping process started, like many, by hand. A difficult and laborious process on a good day. When in California John's son Dan was the uncapper in the outfit, and he did the work by hand – uncomplaining – like all good sons. However, Dan stayed in California when the family moved, and John took over the uncapping duties.

It didn't take him long to figure out there had to be a better way – something faster, more efficient – better. So he built one. It was a bit crude, but it worked, and it was better than doing it by hand.

That same year a beekeeper friend saw the machine, and the potential, and asked John if he could build a couple more for next season, and a business was born.

John, and the family members involved started slow, but by the late 60s and early 70s it was obvious that there wasn't enough time to run all those bees and continue building the metal business. The bees had to go.

By the mid 70s Parowan Honey Company was producing over 200 uncappers per year. Dave Cowen, John's son, was working even more with the company, plus working another job at the same time. There were, during the height of the business in the mid-70s, 11 people working in manufacturing, production and the office.

L to R: Jerry Campball, shop foreman and welder; John Cowen, chief cook & bottle washer; Nathan Cowen, Dave's son; Dave Cowen; Gene Mortensen, accounting, sales & office manager; David Mortensen, sheet metal; Josh Cowen, sheet metal; Mark Hansen, welder and mechanic specialist. Not pictured Jeff Campball, welder, mechanic.

During the 80s business, along with the industry, tended to slow – increased competition, closing the Canadian border and less growth generally – and Cowen Enterprises (a name change from the early 80s) downsized to accommodate.

John has never officially retired and still works every day on developing and producing equipment and at 73 is still a driving force in the company. Dave Cowen has also taken a

The Cowen Boys, L-R: John, Josh, Nathan and Dave

The front of the 10,000 sq. ft. Cowen facility in Parowan.

The largest sale made. This truck holds two 120 systems to go to an outfit in Canada.

lead position and with his wife Tami and sons Josh, 20, and Nathan, 12, continue the family tradition.

Today, Cowen Manufacturing (another name change in 1987), occupies a 10,000 square foot shop in Parowan with seven full and three part time employees. They still specialize in the uncapping science, but have expanded their horizons to include extractors, wax spinners, augers, deboxers, drip pans and stands.

Although they initially made equipment from metal that was plated, they now specialize almost exclusively in stainless for their off-the-shelf and custom equipment.

The off-the-shelf equipment – those pieces that are in the catalog start with the micro uncapper that's hand fed, then the mini, which can handle up to 40 supers per hour (if you're really fast and well organized), the Silver Queen that can handle 60 supers in an hour of any size frame and the Cowen Uncapper, which will tackle up to 73 supers in an hour.

All Cowen uncappers are easily controlled or stopped, have knives that are heated with hot water, steam or electricity and come with stands to hold uncapped frames.

To go with these uncappers, Cowen manufactures a line of extractors, too, ranging from 18 to 120 frame capacity. These extractors, if you've never seen one, are the third kind of extractor design, along with tangential and radial.

The design Cowen and others such as Cook & Beals use is based on the principle that, unlike the other two designs, centrifugal force is applied to the frame such that the major force is focused on the top bar at all times. With radial extractors, although the majority of the force is applied to the top bar, one side of the frame is emptied first due to the direction the frame is spinning.

With the "Merry-Go-Round" design, both sides of a honey frame empty at the same time, thus the time to extract is greatly reduced. Originally conceived in Canada by Hodgson, the principle was refined in the U.S. by manufacturers such as Cowen.

The down side, if you will, is that the design does not accommodate small numbers of frames cost-efficiently. The smallest extractor Cowen Manufacturing produces holds 18 frames which translates to 80 supers in an eight hour day – more than most hobbyists ever own.

The next size holds 36 frames and works well with their Silver Queen or Mini uncapper. It can handle 160-190 supers a day. The 60-frame unit

"Cowen Manufacturing started with a good idea, but good ideas need to be improved on constantly, and that needs to be followed by guaranteed service, anytime, anywhere."

Dave Cowen

Continued on Next Page

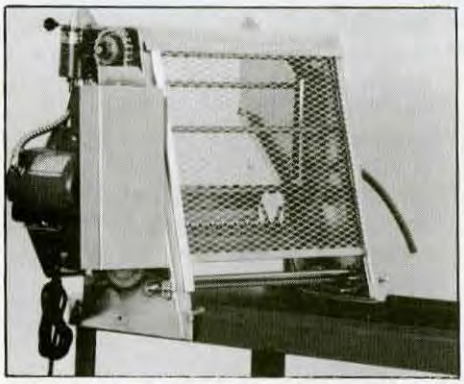
Tami Cowen, secretary and organizer.

COWEN ... Cont. From Pg. 449

moves into power loading systems and handles 240-280 supers a day.

The 120 frame unit is the largest and comes with or without some pretty fancy conveniences – conveyor racks, drip pans, air power loaders, double unloading racks, air brakes, a de-boxer and auger – which make for extremely automated production.

Besides the off-the-shelf sales,

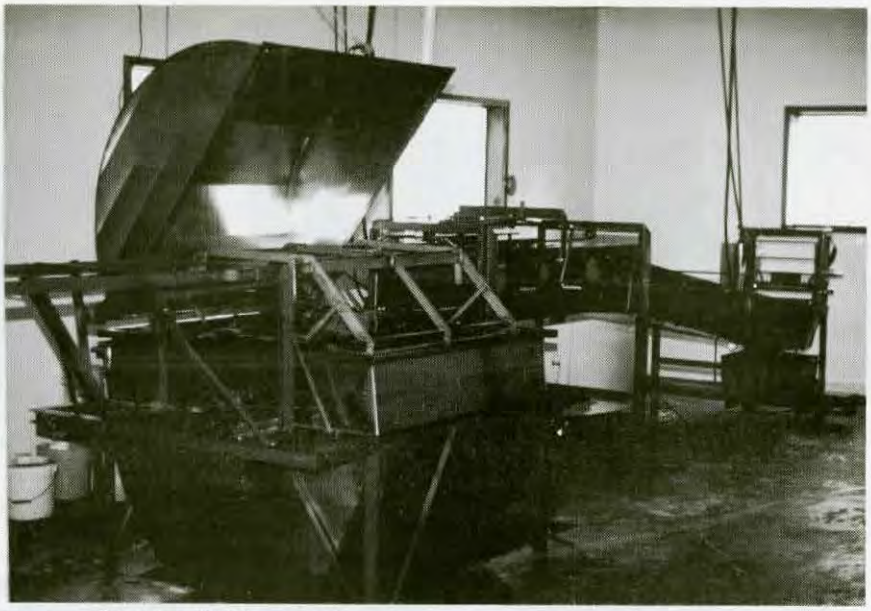


The Silver Queen Uncapper is a standard in the industry, and can handle up to 60 supers an hour.

much of Cowen's business is custom work – making things fit in places they normally wouldn't – to accommodate existing operations. Cowen will go to an operation to install these units, to make sure they work. Often, they send a video with new equipment to make sure things get done right by the new owner.

But back-up service is a strong part of the business, too. Supplying replacement parts – yesterday – for equipment already sold, or taking old equipment in on trade also is part of the business.

The Cowen 18 Frame extractor can handle up to 80 supers in an 8 hour day.



The top of the line 120 frame unit.

Rebuilding and reconditioning used equipment has been increasing steadily as owners of Cowen equipment expand and need bigger capacity units. "But the service end of the business is really our strong suit," says Dave Cowen. "We bend over backward to help when we can. We'll even go to a beekeeper's location and fix it ourselves if we can't get it done over the phone," he added.

And, as stated earlier, that includes installation of the larger units they sell, and very often the customized units they occasionally produce.

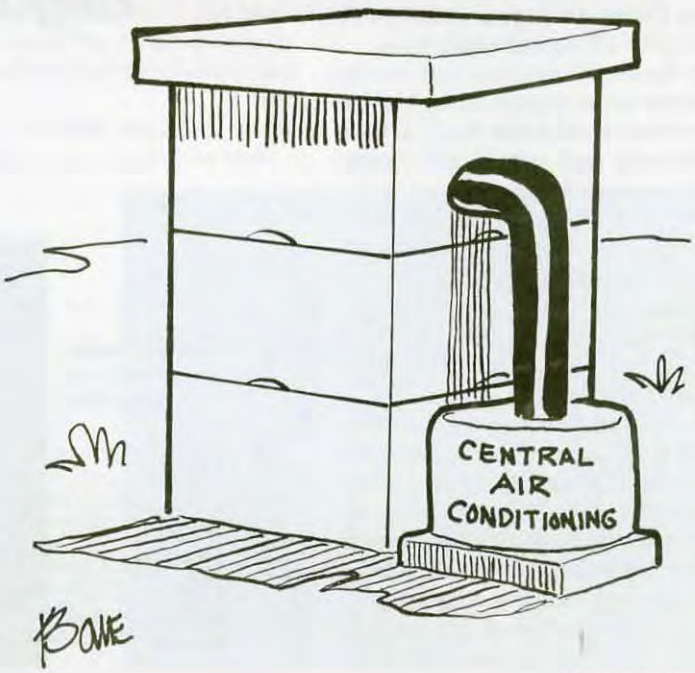
"Producing a good product, then taking care of it so the beekeeper can depend on it, and us, is what we value more than anything," Dave said.

•

John Cowen had a good idea 25 years ago and he and his family are still in the business of trying to make uncapping and extracting honey as easy as possible for the beekeepers they deal with.

"What's in store? This industry needs a real good system to handle wax," says Dave. "That's what I'd like to see, that's what we need," he added.

John's probably working on one now. BC



The African Experience

Beekeepers in the Americas who have already experienced the invasion of the African Honey Bee have learned to deal with, and succeed with its troublesome traits, or have chosen other lines of work.

But almost every country has followed a similar pattern when the bees first come aboard –

First, they try to conquer it by destroying swarms, ridding colonies of 'wild' bees and warning everyone about the dangers involved with this demon.

Next, the fact that the bee can't be beaten at its own game is gradually accepted, and beekeepers and the public learn to live with this new bee.

Finally, the attributes of the African bee are fully appreciated and, when compared to European bees, seem to be much better for those who choose to keep bees.

Of course they're not the same bees and they need different care. The lesson learned, if you will, from this trio of stories is that adapting may be better than sticking to what was. Brazil did, Mexico may, we haven't, yet.

Dr David DeJong in Brazil

Africanized bees behave differently from European honey bees. This is true for their defensive behavior as well as their nesting habits, swarming tendency, absconding behavior, efficiency as pollinators, foraging efficiency, honey producing capability and other behaviors that affect beekeeping and the impact that the bees may have on the public. The rapid and almost complete colonization of the Americas, from northern Argentina to the southern regions of the U.S., are a consequence of the preadaptation that Africanized bees have for warm climates, giving them considerable ecological advantages over the temperate-climate-adapted European bees. During this process of 'Africanization' of the bees in nature and in apiculture, which began in 1957, the changes in the behavior of the bees was widely reported, making beekeeping and honey bees famous, much more so than had ever been the case with European honey bees.

The behavior of the bees, as it is perceived by people, depends on inherent characteristics of these bees, on the environmental conditions, on the ways in which the bees are manipulated and on what people expect of them. This series of factors changes with time and according to the information available to the beekeepers and to the public.

In Brazil, when the African bees started to multiply and cross with the European races that already were established, giving origin to what we now call Africanized bees, they soon became news, especially because of their well-developed defensive behavior. They attacked with much less provocation, in much greater numbers, at

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Dr Roger Morse in Brazil

I spent two weeks in late January and late February in Sao Paulo state in Brazil and talked to 11 beekeepers and several researchers about the management of Africanized honey bees in that country. Among these beekeepers were two of the seven Wenzel brothers, all beekeepers. I also talked to the son of a third brother. These three men have 700 or more colonies each and migratory operations. The other beekeepers I visited had ten to several hundred colonies each. Those beekeepers with fewer colonies did not migrate with their bees as did those with more. I also talked to one lady beekeeper who had over 400 colonies she kept in three widely separated areas in the country. About half of them were moved during the year.

One of the Wenzel brothers told me he gave up beekeeping for two years when the aggressive Africanized bees first came to his area. However, when he learned they were better honey producers than the European bees he had owned earlier he went back into beekeeping. He, and several other beekeepers had tried hybrids, crosses between European and Africanized honey bees but they did not produce as well. All the beekeepers I talked to kept only the naturally Africanized honey bees. It is important to emphasize that these beekeepers are in a tropical climate.

Migratory beekeeping

In the area I visited the chief honey plants are citrus, eucalyptus (which is used for paper pulp and lumber) and

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Jeff Siggins in Mexico

The invasion of the Africanized bee into Mexico in the mid-late 1980s fundamentally caught the Mexican government by surprise. Yet once the problem was recognized, it leaped into action with all the finely-honed skill that a country which has been governed by a single political party for 65 years could muster. Because the Secretary of Agriculture and Water Resources (SARH – Secretaria de Agricultura y Recursos Hydraulicos) already had operating offices in every state staffed by trained professionals with contacts with all areas of agriculture including beekeepers, it was the obvious structural choice. Under SARH auspices, the National Program for the Control of African Bees was established and by 1989, no matter where you traveled in Mexico, you could see blue boxes hanging from trees. Printed on the boxes were the words (translated from Spanish) – Bee traps – Do not touch – SARH. Inside the traps, bee pheromones were used as an attractant. SARH technicians made rounds weekly to check the traps and renew the pheromones and the African bee program was underway.

Although SARH's program is national, it is best to study it on the state level, where the real work is done. The Mexican state of Nayarit is an ideal candidate for study for a variety of reasons.

Nayarit is a medium-size state about halfway between the U.S. and Guatemalan borders located on the west coast just north of Guadalajara. It possesses a variety of climates, from tropical coast to temperate plateaus and arid mountainous regions. It has estuarial silt and sand mixtures, alluvial plains of loam, volcanic soil rich in minerals and rocky scree deposits. Primarily an agricultural state, its commercial crops include sugar cane, mangoes, papayas, coconuts, melons, tomatoes, potatoes, cucumbers, corn and tobacco. Because of this, bees are not only important for honey production, but also for crop pollination.

The capital of Nayarit is Tepic. It is a city of 280,000 people, located about 40 miles from the Pacific Ocean at an altitude of about 2,800 feet with a temperate climate. Tepic is where the SARH offices for Nayarit's African Bee Control Program are located. SARH's organizational chart places the program under the control of the Under Delegation for Farming whose administrative head is Mvz. Adan Guerra Sanchez. The African Bee Program is headed by Mvz. Victor Ibarra. Both men are veterinarians by training (Mvz. = Medico Veterinaria Zoologico) as are many of the 44 technicians who work specifically for Nayarit's African Bee Control Program. It was from these men that much of the information contained in this article was obtained.

The first Africanized bee to officially appear in Nayarit was found in a bee trap near the town of Compostela in September of 1990. SARH personnel immediately went into action. Their first step was an educational campaign aimed at the local population. Posters were put up all over the state and radio and TV announcements were made. These consisted of descriptions of the bees, their nests and their behavior patterns, but most importantly, they gave telephone numbers for local SARH offices and asked people to call immediately to report African bee sightings.

Soon calls began coming in and SARH technicians were immediately dispatched to verify the sightings and, if the bees reported were the offending types, to take action. Using techniques handed down from the federal SARH offices in Mexico City, SARH technicians in Nayarit attacked the African bees wherever and whenever they were found. The recommended SARH techniques of combating the bees are:

1. Soap and water – Spraying the bees with soapy water is the primary weapon against bees as they fly around their nests or when they swarm. They die of asphyxiation.

2. Fire – Burning the nests and the bees has become a favorite method, especially among beekeepers. SARH technicians using fire often work in conjunction with local firemen, both for fire control and for the use of the fire ladders.

3. Dusting with Ammonium Sulfate – The technique has been found to be useful for fallen logs, fence posts and woodpiles where bees have made their nests.

4. Phostoxin tablets – (brand name - Gran Quick Phos) – These are put into tubes, pipes, holes in utility poles and places that can be cemented over or otherwise sealed. Contact with air causes the tablet to gasify and the gas kills the bees. Care must be taken with phostoxin, however, because it is toxic to humans and animals.

5. Introduction of European queens – Both SARH officials and beekeepers alike believe that in the long run, this will be the ultimate weapon against the more aggressive Africanized bees. If the Africanized bee gene pool can be diluted by cross-breeding with the more docile European stock, then perhaps the problem will be solved.

And this brings us to Marco Antonio Muñoz Enriquez of Ahuacatlan, Nayarit. Marco Antonio raises European queens. He is one of a handful of Mexicans who specialize in raising queens and this gentle, humorous, English-speaking beekeeper believes that, right now, the Africanized bee has the upper hand but by carefully studying their habits the war against them can be won.

"Every day I learn a little more about the African bees," says Marco Antonio, "soon I will know enough about them to defeat them." He also believes that no one can do this alone and he has helped form a society of beekeepers in Nayarit who gather and disseminate both information and bee genetic material. He artificially inseminates many of his queens with sperm supplied by bees from local beekeepers as well as sources from other countries. Marco has been extremely happy with results from cross-breeding his queens with genetic material from Susan Cobey, a researcher from Ohio. He is also experimenting with bee sperm from Hawaii and Yugoslavia.

Marco Antonio Muñoz says that he has raised his production level to 24,000 queens per year. He sells them to beekeepers all over Mexico and he proudly claims an 80% success rate in raising queens from larval stage to delivery at the client's apiary.

During the drive to his queen production fields on the outskirts of Ahuacatlan, Marco explained that when the African bee problem first became known to the local people, his neighbors complained about his bees. His response was to ask them if they wanted their flowers and their fruit trees to be pollinated by his nice gentle bees or

Marco Muñoz talks with SARH officials in his apiary.

Queen cells from one of Marco's colonies.

by the dangerous African bees. He told them that if he went out of business that African bees would surely replace his bees. This seemed to satisfy his neighbors and they have had no problems.

Arriving at his queen yard, you find yourself inside walls of volcanic rocks flanked on two sides by the natural and steep hills of Ahuacatlan. Some of the rocks have been painted with purple, red, blue or yellow paint. Marco explains that he read that bees use reflected light as guideposts and since he painted his rocks, the bees have an easier time finding their hives.

Opening one of his hives, Marco points out that two queens live in each box and that it takes 20 days from the time he places the plastic queen cell inside until the time that she is mature enough to sell. Replacing the lid, Marco mused, "It takes investment. Mexicans don't like spending money if they don't have to and some beekeepers don't know that if they would just keep investing in new queens and new equipment, they can have a successful business *and* solve the African bee problem."

This insight is perhaps the reason why 10% of Nayarit's beekeepers have gone out of business in the last three years (SARH statistic). Mvz. Guillermo Gonzales, a SARH technician, shows photos of "rustic hives" and explains that some of the beekeepers saw how aggressively their hives were when taken over by Africanized bees and held little hope for a future as a commercial honey producer.

Perhaps SARH honey production figures justify this defeatist attitude. From a high in 1991 when beekeepers in Nayarit produced 1,218 metric tons (2,200 pounds per metric ton) of honey, production fell to 873 metric tons in 1992 and to 638 metric tons in 1993.

This production shortage is being felt in the marketplace. Sr. Ramon Rivera, who sells honey as well as fruits and vegetables in Tepic's main market complains that the wholesale cost to him for honey has gone from 100 pesos per 28 kilograms in 1991 to 120 pesos per 28 kilograms in 1994. Of course he has to pass this on to his customers.

Beekeepers who have stayed in business have changed their work habits. Many are using protective clothing that not only covers the head and neck, but also the arms and the torso. Rubber gloves such as those used to wash dishes have become popular with some beekeepers and nearly everyone has taken to tucking their pants into their socks so that bees don't fly up their pant legs. Smokers are still being used to gentle the bees, and hives are much the same boxes containing several frames for the honey combs. Now, if swarms are found to be a mixture of European and Africanized bees, the beekeepers are willing to kill the entire swarm and start over again with new European queens.

As for the general public, there seems to be no real fear of the bees at all. SARH officials say about 8 to 10 reports of bees come in each day, but there is no panic about the situation. Talking to people in the street, the few who have seen African bees seem to take it in stride.

On the medical front, Veronica Parra Avenu, a nurse in Acaponeta, tells a story about Jose Cantabrano, who last August was brought by friends to the hospital where she works. He had been stung by many bees, his skin was hot to the touch and he was dizzy. Intravenously he was given 500 mgs. of hydrocortisone, 2 mgs. of adrenaline and 2 cc's of chloropyrimine (Avapena). A hospital staff person called SARH who immediately responded by closing off the street and with the help of local firemen, located and destroyed the bees responsible.

Meanwhile Nurse Veronica began pulling stings out of Senor Cantabrano's head and body. When she had finished, she had removed 250 stings. The lucky Jose Cantabrano walked out of the hospital four hours after arriving.

Others were not as fortunate. In Nayarit in 1993, four people died from African bee attacks. So did 350 animals, including cows, dogs, pigs and horses that had been tied to posts and couldn't run away. Chickens and other farm fowl were not included in the record-keeping, but some were reported killed by the bees (SARH statistics).

Some good news for Nayarit is that the bees have not posed any problems for their tourist industry. According to Felipe Sanchez Villegas, owner of the Marnay Travel Agency in Tepic, not one tourist has had a problem with the bees nor have there been questions from tourists or outside travel agencies about problems with bees.

As for the future, the Mexican government is doing what it can to counteract the unwanted invasion. Guillermo Gonzales explained that one measure taken by the federal offices of SARH to safeguard the bee situation in Mexico was to set up two Federal Genetic Reserves, one on the Caribbean Island of Cozumel and the other on the Pacific Island of Maria Madre. These island reserves have SARH research facilities and colonies full of Mexican bee stock. They have been established with the hope of keeping Africanized bees from infecting the gene pool.

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SIGGINS ... Cont. From Pg. 455

However, last year Africanized bees were discovered on Cozumel, brought to the island on private boats or tourist ships that frequent the main port. Guillermo Gonzales believes that the Isla Maria Madre Reserve stands a better chance of remaining pure because it is a prison island and only one boat a week is allowed to go there. This boat belongs to the Mexican Navy and is inspected for stowaway "pests" by a Mexican Marine before leaving the port of Maztlan and once again while at sea by a SARH technician. SARH technicians live in two houses on the island, maintain the colonies and watch for intrusions that will infect the genetic purity of this European bee community.

The Mexicans consider the invasion of Africanized bees to be very similar to a war. There are battles that will be won and those that will be lost. They know the outcome is still unclear, but that they are in it for the duration. BC

Jeff Siggins is a freelance writer from Los Angeles, California who travels extensively in Mexico and reports on various agricultural events.

DeJONG ... Cont. From Pg. 453

greater distances and with much more persistence than the European races of bees.

Problems in the yard

At the time it was common to have beehives in the yard, together with domestic animals, such as chickens, pigs, cows and the like. Beekeeping and agriculture in general were little developed, and the general population was much more rural than it is now. Each rural property had a little of everything. There were many small farms, with most of the livestock, including the bees, close to the house. Modern movable frame hives were around, but there were also many box type hives, without frames, and therefore without much possibility of management or manipulation. The proximity of the bees to animals and people, which was no problem with the European bees, became dangerous with the Africanized bees. When disturbed the bees came out in great numbers, to distances of 100 yards or more, stinging everything in sight. The animals especially, when they did not have a chance to escape, were stung hundreds or thousands of times, and often were killed. Some species, such as chickens, even when unpenned tended to run in circles and the bees, attracted by the alarm pheromones of the first bees that had stung the animal, continued to attack in impressive numbers. The people tried to protect themselves in their houses or other buildings but were also stung numerous times and, in some (rare) cases, were killed.

The news media

The news media reported these incidents of stinging 'attacks' and generally exaggerated the damages and the consequences. The fear created by the alarming news releases and the misinformation surrounding the incidents and the bees reached fantastic proportions. The idea of bees that attacked people, combined with an air of mystery related to these 'invaders' from Africa, generated widely accepted stories such as the idea that a single sting by an Africanized bee is fatal. Actually there is no difference in the volume or toxicity of the venom of Africanized vs. European honey bees. If anything, Africanized bees have slightly less venom as they are smaller. People believed that the bees were 'bloodthirsty' and deliberately sought out their victims, when the 'attack' is really a defensive response to protect the colony (though it was intensified at times). Swarms, which are impressive phenomena with any kind of bee, became much more frequent and, according to common wisdom, were 'killer' swarms. However, even in Africanized bees,

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a combination of native and foreign weeds. The areas where these plants are found are separated by a hundred or more miles making migratory beekeeping necessary to take full advantage of the flower bloom. The orange growers are glad to have the bees in their groves and no fees are charged. In fact, in one case the citrus grower helps to move the bees because of the benefits he thought he might gain. However, the owners of the eucalyptus woods charge rent on a per colony basis. Some of the Wenzel brothers also move colonies as much as 1,500 miles north for yet another honey crop.

Colonies are usually moved in two supers and weak colonies in a single box. The hives are screened individually and entrances are blocked. The top screens, made of heavy-duty hardware cloth, are about an inch-and-a-half deep so that there is a clustering space above the top bars of the frames in the top super. As far as I could determine, no Brazilian beekeepers moved with open entrances and screened the whole load as many beekeepers do in this country. The colonies are moved individually and no one I visited used pallets or any kind of hive loader. One of the Wenzel brothers covered the whole load with a plastic screen in addition to individual screens.

The citrus honey flow is short, much like that in the United States. At a maximum, with several varieties of citrus being grown, it may stretch over a period of 30 or so days. The eucalyptus, on the other hand, may be a major yielder over a period of three months with a little dribble of nectar before and after the main nectar flow. The wildflower crop is variable. Beekeepers in Brazil are very much aware that bees in colonies short of food may abscond easily. For this reason stationary beekeepers are sometimes forced to feed their colonies between flows. However, the migratory beekeepers have found that moving into a eucalyptus woods for four to five months, where there is usually some early and late bloom, provides the food necessary to keep the bees from absconding.

Colonies are usually kept on hive stands to protect the bees against small predators. It is felt that, by getting the colonies off the ground, hive stands also help the bees ripen honey in the area that has high humidity during part of the year. One of the Wenzel brothers showed me a hive stand made to hold four colonies. Other beekeepers told me that it is best to keep the colonies on individual hive stands since the vibrations made while working a colony might disturb bees in the other hives. Obviously, that did not concern everyone. Most of the beekeepers with whom I talked preferred to keep about 60 to 70 colonies in a single apiary, not unlike commer-

Bee Genetics Lab of the University of Sao Paulo, Brazil.

One of the Wenzel brothers (r) a 5th generation beekeeper with a nephew.

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the swarms are normally gentle with very little tendency to sting.

Problems

The beekeepers, also scared by the news, were not prepared to confront these new bees. Their protective clothing was inadequate, the smokers were too small and not very efficient, and the way in which beekeepers manipulated their hives greatly provoked these very sensitive bees. Pressured by the public and by the incomprehension of the official entities, the beekeepers abandoned their profession in great numbers.

The few that persisted took their apiaries to isolated areas but confronted numerous difficulties. The bees frequently absconded, leaving only empty hives, while other colonies threw one swarm after another, producing very little honey. Any beekeeper who dared collect the small surplus found that the bees became aroused to an almost unbelievable state of fury.

The Africanized bees' behavior was quite distinct from that of the European races and they were perceived as being dangerous, unproductive and undesirable. However, returning to the European bees was impossible since the Africanized bees were so superior in their adaptation to the environment that the European bees practically died of hunger due to the intense competition.

Adaptation

Little by little, some of the more stubborn beekeepers tried to find means to work with this new type of bee. Meetings were held at a national level with the participation of University researchers. Together they developed equipment and techniques that permitted apiculture to start anew. Eventually the Africanized honey bee, which had only been known for its exaggerated capacity to sting people, acquired positive qualities, such as honey producer and pollinator.

The public and the press also followed these changes in attitude and, instead of fearing the bees, began to look upon them with respect, eventually accepting their nervous and defensive behavior as a natural phenomenon of nature.

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cial beekeepers in this country.

Queen excluders

A few beekeepers use queen excluders but only on the citrus honey flow. Since the flow is relatively short using an excluder confines the queen to a single super and makes it easier to remove honey and to prepare for the next migration.

Replacing bees

Like beekeepers everywhere, Brazilians lose a certain percentage of their colonies each year for a variety of reasons, primarily old, failing queens. One full-time beekeeper told me he needed to replace about 20% of his colonies each year. All of the beekeepers with whom I talked made up most of their losses by capturing swarms in bait hives that they hung at about head height in open but shaded areas. There are a large number of swarms at some times of the year and capturing them is an easy task.

I was shown several bait hives. Most beekeepers preferred to use a super with ten frames, each with a narrow piece of starter foundation about four or five cells deep. I asked if these swarms were requeened and was told they were not. None raised queens since capturing swarms was too simple and easy.

The size of the captured swarms varies greatly as might be expected. Small swarms are combined by placing newspaper between the supers in which they reside.

Precautions

The beekeepers with whom I talked were all aware of potential stinging problems near their apiaries. Although they did their best to locate their colonies away from houses and buildings, no one fenced an apiary to protect it against kicking animals. They said cows and horses learned to respect the bees and to stay away from them. Thievery is often a problem.

The key to working with Africanized honey bees, I was told, is to have a big smoker and to use it aggressively. No one smoker fuel is thought to be any better

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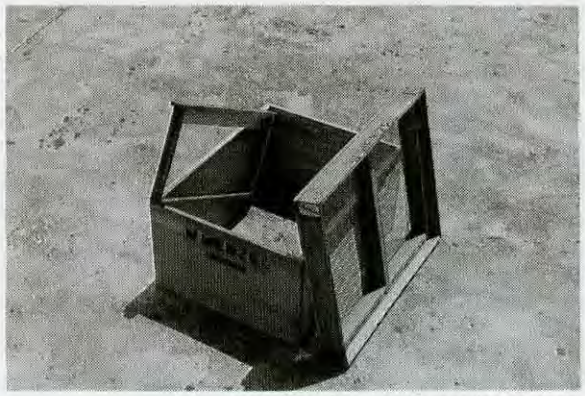
Part of the research apiary at the Lab.



Brazilian hive with moving screen.

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At the same time that people adapted to the bees, the bees also changed their behavior. Placed in apiaries distant from houses and stables, the famous deaths of animals became rare. With more adequate protective clothing, beekeepers were stung less; therefore, there was less liberation of alarm pheromones which would otherwise make the bees furious. The beekeepers traded the multiple-colony hive stands for individual supports, avoiding the vibrations which provoked colonies. With a larger and more efficient smoker the beekeepers had a means to control the bees.

Rough handling and carelessness by beekeepers during manipulation of the frames and other parts of the hive, provoked a defensive reaction in the bees. In this way the bees 'taught' the beekeepers to be more careful and, little by little, beekeepers changed the way in which they worked with the bees. As a consequence the bees became less aggressive.

Did bees in Brazil change?

People who worked with the bees during the process of Africanization, and afterwards, were aware that the bees changed during this period. Possibly there were genetic changes. Certainly the bees found in Brazil now are less 'aggressive' or, better expressed, less defensive than in the 60s, at the height of the problems. However it is difficult to determine how much the changes in the apiaries, in the equipment of the beekeeper, and in the management and bee handling practices effect changes perceived in the bees.

We can get some of the answer from the bees themselves. If we place strong colonies on multiple and unstable hivestands, if we use rough surfaced and dark clothing, rough thick leather gloves, and the tiny inefficient smokers of the old days and if we work the hives roughly, banging the hive parts, applying only a little smoke once in a while, and only after the bees have already gotten riled, I am certain that we will have a good demonstration of the 'original' Africanized bees. If anyone dares to follow this 'advice' now, I suggest that it be done in a remote location. It would not be wise to involve animals, innocent bystanders or the press again.

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than any other. The beekeepers I visited all wore good leather or rubber six-to-eight-inch high boots and emphasized the importance of putting on one's veil before entering the apiary. Many beekeepers wear gloves in Brazil. Leather gloves carry too much offensive odor that appears to anger bees. Rubber, platex-type, gloves work well. Heavy cloth gloves that have a smooth, washable vinyl coating are preferred.

I have been told repeatedly on these trips to Brazil, that judicious use of smoke and careful manipulations can do much to reduce aggressive in Africanized bees. One researcher told me there is too much "slam-bang" beekeeping and that, if he goes into an apiary alone and proceeds to make colony inspections carefully and at a reasonable rate, he receives fewer stings.

Swarm control

Providing adequate space for honey storage usually controls swarming if the colony is not honey bound. (Colonies are honey bound if there is a quantity of stored honey above the brood that prevents the queen from moving upward to lay eggs.) During the honey flow, most Brazilian colonies are kept in three or four supers, rarely more.

The beekeepers I talked to in Brazil do not requeen as a deterrent to swarming. Colonies are checked to make certain they are queenright and not honey bound but there are few thorough inspections of the broodnest.

Removing honey

Labor is much less expensive in Brazil than in the United States and all beekeepers have helpers. The combs of honey are removed individually when they are about 80% or more capped. Africanized honey bees run off the comb when the frames are lifted from the supers. The remaining bees are easily shaken off. One reason hybrid bees are not favored is that it is more difficult to shake them off the combs of honey. One beekeeper tried a bee blower and did not care for it. Bee escapes and repellents are not used. I found no one who produces comb or cut comb honey so the special problems associated with removing it are not of concern. Eucalyptus honey granulates rapidly and for this reason two or three harvests are made during the three-to-four month honey flow.

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Provoking the bees

In a way, I have witnessed this experiment during training courses and during my work in Brazil and in other countries that have Africanized honey bees. When a group of U.S. researchers visited our lab a few years ago, I witnessed an incident that impressed me and everyone around at the time. They tried to staple on a plastic entrance reducer without using smoke, as part of a test of a method to measure colony defense behavior. The bees began to sting everyone around the three Genetics buildings with an intensity that I have never seen in the ten years that I have worked there. We have more than 200 colonies right behind our buildings but we're used to working the bees and never provoked such a reaction.

During a course for Central American technicians given in Ribeirao Preto some years ago, I noticed that they were surprised at the gentleness of the bees, in comparison with what they had expected from the news at home. We explained and demonstrated how to work in the apiary, but it was obvious to me that the Central Americans (and Mexicans) were not really absorbing some of the many small but important modifications in management which are necessary in order to control a colony of Africanized honey bees. Afterward, I took a group to an apiary off campus and asked them to watch very carefully while I opened a colony, explaining what I was doing. Then I let them have their turn. The first 'volunteer' proudly showed everyone what he could do. In less than a minute the bees had chased us out of the apiary. Again the bees had 'returned to their old habits' because people were repeating the same errors made years ago.

On several other occasions, when someone has made a gross error (usually a foreigner), I have heard experienced beekeepers say, "that's how the bees were in the old days."

Getting to know

My first experiences with Africanized bees began in 1980. I already had considerable experience working with European bee colonies in the U.S. As a bee inspector I had often opened and searched the brood nests of 100 or more bee colonies per day, from eight in the morning till late in the afternoon, in all kinds of weather. I took a lot of stings and never used gloves. For this reason the adaptation to Africanized bees was not so difficult. And I had the advantage of observing and working with Brazilian beekeepers and researchers with considerable experience. Nevertheless it was obvious that something was different. The bees repaid any mistake quickly and efficiently. What most impressed me were the nuclei. While large colonies in the U.S. were well able to defend themselves, we worked the nucs practically without smoke and frequently without a veil. The Africanized nuclei were quite different! Even a nuc of four or five frames had the capacity to send out hundreds of defenders in seconds. Obviously I learned to respect them. Later, when I visited the U.S. and Mexico, I was surprised at how 'slow' the (European) bees were. After getting used to the Africanized bees, the Italian bees seemed to have something wrong with them.

I had various opportunities to observe that the

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Hive products

There is great interest in royal jelly, propolis and pollen, all of which are sold as elixirs, rejuvenators and medicaments. I did not find anyone collecting or using bee venom. The hive product side of beekeeping is one I avoid since I believe firmly in traditional medicine. However, there is a good market for these products in Brazil. I was told that royal jelly producers use bees that are hybrids between European and African stock as the hybrids produce more royal jelly than do the Africanized honey bees.

Pests, predators and diseases

Armadillos are a serious problem. The adults of one Brazilian species weigh about 50 pounds and easily tip over beehives and feed on the bees, brood and honey. I visited one that had suffered serious damage from these animals. There were combs on the ground and in two cases the sides of well-nailed supers had been broken apart.

Another concern is wax moths. Most Brazilian beekeepers store their supers on colonies but even then there are problems.

European foulbrood is present in Brazil but is not a serious problem. Colonies that are kept in full sunlight have less trouble with this disease. American foulbrood is not found in Brazil but has become firmly established in Argentina during the past few years. Brazilians are worried that it might enter their country and are monitoring for it.

There was no evidence of the use of drugs or chemicals for disease control.

Wood preservatives

Hive bodies are painted various colors. Since this is a tropical part of the world, and the colonies are exposed to full sunlight, one might think it best to paint the hives white so as to reflect the sun's rays. However, this is not the case and the colonies do well whatever the hive color. Some beekeepers are using a hot dip with seven pounds of beeswax, five pounds of paraffin and 12 quarts of kerosene to treat supers. I mentioned the danger of fire when dipping supers in this molten mixture and those who use this treatment nodded and indicated they were aware of the dangers. The treated supers are allowed to air dry for a month before they are used. Apparently, the kerosene leaves no toxic residue.

Concerns

Brazil, Argentina, Uruguay and Paraguay have joined in a mutual sales area in which all tariffs and trade barriers will be eliminated. In some ways this is like our North American Free Trade Agreement with Mexico and Canada. Brazilian beekeepers are worried that Argentine honey, which they know is of high quality, may soon flood Brazil. Argentina is one of the major honey exporting countries of the world and has a surplus to export each year.

Beekeepers in Brazil are aware that the public wants a high quality product and are concerned about keeping

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up with modern technology. Since raw iron and other metals can damage honey, there is a strong effort to switch to stainless steel.

No one rents bees for pollination in the part of Brazil I visited. However, further south, in the apple growing region, colonies are rented. There is increasingly interest in canola (a modified rape seed) in Brazil and there may be a demand for pollination if acreage is expanded.

Publicity

The adverse publicity that Africanized honey bees once received in Brazil because of their aggressiveness appears to be a thing of the past. Honey is a favored food item and, in general, beekeepers are not concerned about adverse publicity. They are interviewed and enjoy a good relationship with reporters from the various media. BC

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Africanized bees still had *considerable* defensive capacity, especially when they were disturbed without adequate application of smoke. Several times when we went to collect samples of bees from wild colonies suspended from a cliff overhang, where access was only possible through makeshift rigging of ladders, we were not able to get smoke right on the bees. The bees created impressive scenes, with many thousands stinging through any kind of protection we thought would stop them, at distances of up to hundreds of yards.

Some years ago I developed an electronic device that shook a leather patch in front of the bees at variable frequencies. It was quite an ordeal to stay near the colony during the 30 seconds of the test, and I generally had to spend 10 minutes or more getting rid of bees in order to return to the lab without risking getting other people stung.

Reductions in defensive behaviors?

Certainly I cannot completely discard the possibility that the bees have become less aggressive due to some type of selection; there may have been a change in the genetic composition of the bees. However if we raise this possibility, we have to postulate how this may have happened.

The 'massive' introduction of virgin Italian queens in the 60s and 70s by the universities in Brazil involved 20,000 queens. Certainly this helped the beekeepers adapt to the Africanized bees, because it gave them the opportunity to work with bees that were half way between European and Africanized. It was easier to learn how to control this hybrid than to take the big step directly from European bees to Africanized.

However, 20,000 or even 100,000 queens are very few when we consider the number of colonies that exist in the region. Swarms issuing from 26 African colonies in 1957 dominated a population of European bee colonies many times greater. Similar experiments involving the introduction of European queens in South Africa had no lasting effect on the type of bee in that country.

The great majority of beekeepers in Brazil do not raise or substitute queens. Many of the few who did regularly use hybrid colonies (first cross between virgin Italian queens open-mated with Africanized drones) now prefer to use only Africanized bees. The population of bees used by the beekeepers is practically identical to the wild population. The constant trapping of wild swarms, and the lack of control over the queens in the apiaries guarantees this identity. Future management leans toward abandoning European bees and selecting among the Africanized lines, though at this time few do so.

However we cannot discard the possibility that some genetic changes have had an influence on the behavior of the Africanized bees. Beekeepers could be selecting the bees indirectly, by maintaining and taking care of the colonies that stay in the hives. At the same time they may eliminate colonies that are excessively aggressive. Additionally, environmental factors may be involved. Nevertheless, any such selection 'efforts' by the beekeepers would be compromised considerably by the capture and use of wild swarms.

The bees at the front

As the African or Africanized bees moved north at rates of 200 or more miles per year, many beekeepers and researchers concluded that the 'front line' bees were different from those found in Brazil. Certainly this makes sense, as the bees that migrated fastest could be those with the strongest African characteristics. I had the opportunity to work with these front line bees in Honduras and El Salvador and, though the local beekeepers were taken by surprise due to the strong differences from their European bees, I did not find them different from what I was used to in Brazil. Using the same handling techniques that I used routinely with Africanized bees, I was easily able to keep them under control. It was my impression that the initial perceptions of the Africanized bees as being exceptionally 'African' were due to the sudden confrontation strongly influenced by the 'fame' that preceded their arrival.

Perceptions

The expectations that people in Brazil have concerning the bees have changed. This is true both for beekeepers and the public. They understand that the bees are sensitive insects and deserve respect. The way in which the bees are perceived has become modified as has the reactions of the public to any contact with them. These changes were in great part due to the beekeepers' newfound abilities to handle these bees without provoking them.

In 1970 at the first national beekeeping congress beekeepers were asked to list their principle problems. Excessive stinging placed first. In 1980, at the Fifth Brazilian Beekeeping Congress, this same question was asked again. Stinging problems figured a lame fourth on the list. Today it is not even mentioned.

What has changed, the people or the bees, or both?

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The rest of the Americas

Beekeepers in Brazil had no information available about how to handle the Africanized bees during the first years. As the bees entered the other countries, those beekeepers had the advantage of the Brazilian experience. Unfortunately most of them did not learn from it. In the Guyanas, Columbia and Venezuela, beekeeping has disappeared and is struggling to come back.

In the region of Central America, including Panama and Mexico, several assistance programs, financed by FAO (Food and Agriculture Organization of the United Nations) and by OIRSA/IDB (Central American Organization for Animal and Plant Disease Control/ InterAmerican Development Bank) trained technicians and beekeepers from the eight countries often using Brazilian teachers. For this reason the adaptation period to the Africanized bees has been shorter than in Brazil, Venezuela and Columbia. But the damage in some of the countries such as Panama, Honduras and Costa Rica has been considerable. The only countries that took advantage of the Brazilian experience were El Salvador and Mexico. Their honey production was hardly affected and – now both export honey to other countries in the region.

Interestingly beekeepers in El Salvador have been investigating Honduras, with the idea of taking advantage of the considerable beekeeping potential of that country, which was essentially abandoned by Honduran beekeepers.

Without doubt, the Africanized bees spurred local beekeepers to improve their technology. In Brazil the box type or frameless hives were destroyed or abandoned. It was impossible to manage Africanized bees in such hives. Many people who merely 'kept' bees, without any type of management other than occasionally robbing the honey, could not adapt and they quit. Beekeeping became more professional, though as new management techniques have been developed, we see that people are returning to beekeeping as a secondary activity, and even as a hobby. This was especially evident in the early 80s.

In other countries similar changes have occurred.

One aspect of the Africanized bee that is hard to ignore is their incredible capacity to reproduce. They throw many swarms that become established in a wide variety of sites. Obtaining bees has become easy and cheap. In Central America, where the large beekeepers traditionally hired poor rural help to work their hives, we found that many of these employees have taken advantage of the ease in obtaining bee colonies to start their own apiaries. The Africanized bee has made beekeeping more democratic.

In the case of the U.S., where Africanized bees arrived three years ago, there is not much to be said, because an intensive program to find and destroy the swarms has reduced the impact on apiaries, though at some cost. In spite of this, the Africanized bee has colonized a large part of Texas and is also found in Arizona and New Mexico. It may be in California.

As was expected, the Africanized bees are not very 'aggressive' in the U.S. because, as they enter less tropical climates, the 'excessively defensive' behavior is considerably reduced. This was clearly demonstrated by Brandeburgo, who compared the defensive behavior of Africanized bees in Recife (near the Equator) and Ribeirao Preto (22 degrees south latitude). The bees sting much more in tropical climates and the same bees, moved to a cooler climate, are less likely to sting.

Publicity against the Africanized bee

The reaction of the people is very important. As the Africanized bee invades a country, the authorities have tried to eliminate them. Generally they launch campaigns, advising the public of the peril and exterminating any swarms they find. They make it clear that the Africanized bee is undesirable and that it does not produce (Goncalves 1975). In all of the tropical and subtropical countries it has reached, the Africanized honey bee has dominated the European bees and become the bee beekeepers use, so the original campaigns have caused serious problems. The problem is, that after such extensive campaigns against the bee, it is much more difficult to convince the public and beekeepers to accept the Africanized bees. How can one justify the necessity to respect a bee, which until then had to be destroyed? This creates serious problems for the beekeepers, since people will not accept apiaries anywhere.

Even in the United States, the authorities have followed the same path. Some regions of the country will be permanently colonized by the Africanized bee, yet the strong publicity campaign is provoking the appearance of laws and regulations which prohibit or impair beekeeping. They are repeating the errors of the other countries.

In conclusion, the impact that Africanized bees have on people and on agriculture has much to do with how people handle them and on their acceptance by the public and the authorities. BC

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BEEKEEPER'S PROFIT OR LOSS

The Bottom Line

mark winston

I'm finally getting old enough to be nostalgic, a state of mind where you remember how everything was better in the good old days. In my memory, beekeeping was a simple occupation, when a good queen and sound management practices could provide an income. Today, government regulations, new diseases, paperwork and taxes, urbanization and big business farming have created a more complex environment in which to manage bees. Our personal lives have become more hectic, too. I remember receiving letters and taking the time to read them, think about them, and eventually respond. Today, if I don't reply within minutes to the whine of the fax machine or the beep of my electronic mail system, my "correspondents" assume that I'm sick, retired or dead.

Not everything has changed, though. The bottom line for commercial beekeepers still is to make money, and sound management decisions coupled with a good queen can still earn a beekeeper's living in the 1990s. What has changed is that we seem less willing to explore simple aspects of bee management that can substantially increase beekeepers' incomes. Bee research today addresses complicated issues, and has drifted away from what I call the Bottom Line approach, management-oriented research that can tell a beekeeper which system will earn more dollars at the end of the season.

I'm not writing this article to criticize my fellow researchers, or to bemoan the sad state of bee research today. I think bee research is healthier now than it has ever been. I'm amazed at the training and overall quality of our young researchers, and the scientific tools they have to work with dwarf anything we've had available in the past. Further, the problems our industry faces can, and have, benefited greatly from contemporary research contributions. However, today's researchers often overlook the simple economic problems that used to be the bread and butter of bee research. New discoveries are made, published, and then left without ever asking the *B.L.* Question: At the Bottom Line, will a beekeeper be richer or poorer at the end of the season because of my research?

I searched for recent examples of Bottom Line research to illustrate good management studies, but couldn't find many examples of this research "genre." So, I went back to the olden days, the 1980s, and there found some real chestnuts, excellent examples of how old-fashioned management research provided important contributions to beekeepers' livelihoods.

One of my favorite Bottom Line studies was conducted by a former student of mine, Cynthia Scott-Dupree, in the scenic Okanagan Valley region of British Columbia. Cynthia was asked by the Okanagan Valley Pollination Association to answer a very simple question: Do we make money moving our bees to pollinate orchard crops in the spring, or would it be economically superior to leave the colonies in their yards?

She compared a number of different management systems, including 1) moving bees for pollination, 2) honey production alone, with no pollination moves, and 3) package bee production from pollination units, maintaining colonies at or above minimum pollination strength following package shaking. Cynthia examined labor, feed, moving and equipment costs for each system, as well as income from honey production, pollination contracts and package bee sales. In addition, she measured biological characteristics such as brood area and colony population at the end of the season, to determine whether any of the management schemes resulted in poorer quality colonies.

The results were fascinating: the most intensively managed bees, those used for honey production, pollination, and package bee production yielded the most income, with no real loss in colony vigor by the end of the season. In fact, the intensively managed colonies were in *better* condition than those used only for honey production! The Bottom Line: honey production alone yielded an average gross income of $12 per colony, honey plus pollination yielded $67 per colony, and honey, pollination, and package bee production yielded

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The Bottom Line: the overwintering system provided a return over costs of $24.70 per hive vs. $13.75 for packages. This study gave our beekeepers considerably more confidence in switching from package bees to wintering and its methods are still used by beekeepers.

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$87 per colony. These results were taken to heart by our Okanagan Valley beekeepers, many of whom not only continued to pollinate, but now also produce packages and nuclei each spring.

Another Canadian example of management-oriented, Bottom Line research was conducted by Don MacDonald, the former Provincial Apiculturist, and George Monner, an economist, in the Peace River region of Alberta. This area is far to the north, and the combination of long summer days and good bee forage produces the highest colony yields in the world, often surpassing 400 pounds per colony. Beekeepers in the Peace River area traditionally purchased package bees from the southern United States each spring, harvested all the honey at the end of the summer, and then killed the colonies. However, the impending threats of mites and Africanized bees inspired MacDonald and Monner to investigate whether this package bee system was providing the best income, or whether overwintering systems could yield equal or better returns.

Their study involved a detailed economic analysis of a 2,000 hive operation, including such items as depreciation, precise cost analyses, labor, interest on bank loans and, of course, honey production in the end. Overwintering required considerably more long-term capital investment than package bee management, to build and operate an overwintering building. However, the package bee operation had higher short-term costs to purchase packages each spring. The Bottom Line: the overwintering system provided a return over costs of $24.70 per hive vs. $13.75 for packages. This study gave our beekeepers considerably more confidence in switching from package bees to wintering and its methods are still used by beekeepers to calculate the economics of various wintering systems.

Another good example of Bottom Line management research also involved wintering, and was conducted by Basil Furgala and his students Mark Sugden and Steven Duff in Minnesota. They evaluated colonies wintered outdoors using two different hive sizes (two vs. three deep hive bodies) and two commonly used winter packing methods, insulite boards vs. cardboard winter cartons. They assessed winter survival, spring build-up and honey production. Further, they recognized that apiary site and seasonal differences can have great impact on colony performance so they conducted their study at two different locations, and for three seasons, to make sure that they had fully evaluated the impact of their treatments.

They calculated a mean productivity index for each treatment that took into account the number of colonies surviving each winter and the subsequent honey production from each colony. They found no differences in colony productivity due to the winter packings tested, but the three-high colonies were superior to the two-high units, yielding approximately 500 lbs. more honey per colony over the three-year study period, according to their productivity index. If we assume $0.40 per lb. for bulk honey sales, an operation of 1,000 colonies would have had $20,000 greater income over the three-year period using the three-high system relative to the two-high. Thus, a very simple management maneuver, threes vs. twos, made an enormous difference in the Bottom Line.

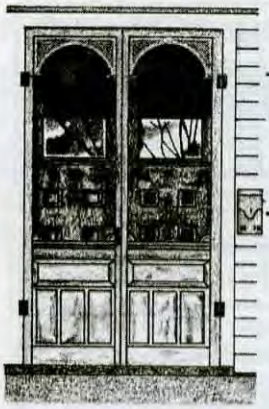
Furgala's laboratory did another management-oriented study that I have always admired, because I've never had the nerve to do it myself. In this study, they evaluated six honey bee queen stocks used in Minnesota by purchasing queens of different lines from commercial queen rearers and and introducing them into study colonies. This type of study obviously takes courage, because in the end the queen rearers whose stocks produce the most honey will love you, and those ranked low will never speak to you again!

They examined a number of stock characteristics, including aggressiveness, tendency to swarm, queen loss and honey production. Again, they did it right by managing everything the same way and conducting the study at numerous locations over a two-year period. Without mentioning the name of their stocks and producers (I'm not nearly as brave as Furgala), they demonstrated that some of the stocks tested were not suitable for Minnesota, while the best queens headed colonies that produced annual honey crops of 8-30 lbs. per colony more than the other queen stocks. For a 1,000 hive operation, again assuming honey at $0.40 per lb., the better queen stocks would have yielded $3,200-$12,000 higher income each year. The use of the best queen stocks would have provided the

If we assume $.40 per lb. for bulk honey sales, an operation of 1,000 colonies would have had $20,000 greater income over the three-year period using the three-high system relative to the two-high. Thus, a very simple management maneuver, threes vs. twos, made an enormous difference in the Bottom Line.

differences between survival or bankruptcy for a beekeeper operating an economically marginal business, or the difference between a winter vacation for the family in Hawaii versus Duluth, Minnesota for the beekeeper in a more profitable situation.

The Bottom Line: There's still a place for economically-oriented management research in our beekeeping community. North American beekeeping is enormously diverse, and there are many ways to make money with bees, and to lose it. Bottom Line management research can make the difference between the making or the losing, and is a deceptively challenging art form for researchers searching for ways to be intellectually stimulated while conducting useful research. Indeed, there is a real elegance to a good management study, a satisfying sense that simple solutions are still out there for complex problems. So much for nostalgia: Bottom Line research is still out there today, just waiting for us to do it.BC



HOME HARMONY

ann harman

Potato Salad

Every cookbook ever printed seems to have a recipe for potato salad. Next to coleslaw it's a mainstay of the American menu. No picnic, no fast food restaurant would be complete without potato salad. At first thought, honey does not seem to be a suitable ingredient for potato salad. However, keep in mind that honey is versatile and can be used in many dishes. Let's see what we can do with potato salad.

For really good flavor and texture, boil potatoes in their jackets. Then peel and marinate in the dressing while still warm. Potato salads can be served warm or chilled. The worst problem with potato salad seems to come from potatoes that fall apart when diced, making a sort-of-mashed-potato salad. Small, red, waxy potatoes hold their shape better than other types of potatoes. However, Idaho potatoes, medium-sized and mature, are a good second choice. Please don't use leftover cooked potatoes since you want flavorful, firm cubes for your salad. Don't overcook the potatoes. Even the little red ones will fall apart with that treatment.

Be certain that the ingredients for your potato salad are bite-size. Picnics rely on plastic forks and knives and sometimes the only table is your lap. So give the eaters a break.

Another reason for small pieces is that you will have more surface area to coat with dressing. This actually makes a more flavorful salad. Furthermore, when you marinate the warm potatoes in the dressing the flavors will be absorbed better, again making a more flavorful salad. If you wish to serve your potato salad chilled, you can put it in the refrigerator after letting the potatoes and dressing cool to room temperature.

Since potato salads are frequently served at picnics, keeping them cold can be a problem. But that's easily solved. Take a large bowl and put ice in it. Then nestle the potato salad bowl into the ice. This procedure will keep the salad cold for quite a long time – actually it will probably be eaten up before all the ice melts.

Warm potato salad is a welcome addition to a winter meal. But a warm salad can be a good accompaniment to a summer barbecue, too. Choose your potato salad, dressing and salad temperature with a thought to how it will complement the rest of the meal. One of these recipes will be certain to compete with your favorite.

Warm Potato Salad With Honey Dressing

The National Honey Board recognized that potato salad can indeed be made with honey and gave us this recipe.

1/3 cup vinegar
2 tablespoons vegetable oil
1/4 cup honey
1 tablespoon Dijon-type mustard
1/8 teaspoon bottled hot pepper sauce
1-1/2 pounds cooked small new potatoes, cut into bite-sized pieces
4 to 6 slices crisp-cooked bacon, crumbled
2 tablespoons chopped parsley
2 tablespoons chopped green onions
1/2 teaspoon salt

Whisk together vinegar, oil, honey, mustard and pepper sauce in large skillet; mix well. Add cooked potatoes; stir gently to coat all surfaces. Cook on medium heat, stirring gently, until potatoes are heated through. Add bacon, parsley, green onions and salt; mix well. Makes 4 to 6 servings.

Variation: One cup cooked sliced mushrooms may be added with potatoes.

Sweetened With Honey The Natural Way
National Honey Board

Winter Potato Salad With Fresh Fennel

Fresh fennel is an interesting vegetable. Its texture is similar to celery but its flavor is distinctive, slightly licorice-like. It may not be available in your area the year around but when it is in season, usually winter, you will want to try this next recipe. The leaves of the fennel can be used as a garnish, edible, of course. The bulk is generally sliced crosswise and the core removed. If you cannot find it, you can substitute an equal quantity of celery and add 1/4 teaspoon coarsely crushed fennel seeds or anise seeds.

About 2 pounds potatoes
1/4 cup sherry wine vinegar
1 clove garlic, minced or pressed
1 teaspoon salt
1 teaspoon honey
1/4 teaspoon ground allspice
1/4 teaspoon whole white or black peppercorns, coarsely crushed
1/3 cup salad oil
1/4 cup finely chopped onion
1 cup thinly sliced fresh fennel

Cook potatoes in boiling, salted water to cover until just tender. Drain and while warm, slip off skins and cut into bite-sized pieces. (You should have about 6 cups.) Place in a large bowl. In a small bowl mix vinegar, garlic, salt, honey, allspice, and peppercorns. Using a whisk or fork, gradually beat in oil until well combined. Pour about half of the dressing over potatoes. Add onion and mix lightly. Cover and refrigerate for at least 2 hours (or as long as overnight if you wish). Lightly mix in fennel and remaining dressing. Refrigerate until cold. Makes 6 servings.

The Complete Book of Salads
ed. Ortho Books

German Hot Potato Salad

There's plain potato salad and there's "German" potato salad. The German variety is frequently served warm and has a characteristic sweet-sour dressing. Crisp bacon is a traditional ingredient.

6 medium-size potatoes
4 strips bacon

1/4 cup chopped onion
1/4 cup chopped celery
1 dill pickle, chopped
1/4 cup water or stock
1/2 cup vinegar
1/2 teaspoon honey
1/2 teaspoon salt
1/8 teaspoon paprika
1/4 teaspoon dry mustard

Cook potatoes in their skins until just tender. Peel and slice into bite-sized pieces while still hot. Cook bacon until crisp. Remove from skillet. Sauté onion and celery in bacon drippings until golden. Add chopped pickle. In a separate saucepan heat water, vinegar, honey, salt, paprika and mustard until the mixture boils. Remove from heat. Combine all ingredients in the skillet, stir gently and serve at once. The salad can be garnished with shopped parsley or chopped chives. This salad can be served cold. Makes 6 servings.

Joy of Cooking
Rombauer and Becker

New Delhi Lentil Potato Salad

Now we will break from tradition and fix an Indian potato salad. Try this one for your next potluck picnic. You may well find it a welcome change.

1 cup lentils
2 cups water
1 cup plain yogurt
2 tablespoons Dijon-style mustard
1/2 teaspoon salt
1 teaspoon honey
4 cups diced, cooked potatoes
1/4 cup finely chopped green onions
1/4 cup finely chopped pickles, dill or sweet – your choice
1/4 cup finely chopped celery
2 hard-boiled eggs, finely chopped

Combine lentils and water. Cook for 20 minutes or till tender. Drain well and cool. Combine yogurt, mustard, salt and honey. In a large bowl, combine cooled lentils, diced potatoes, onions, pickles, celery and eggs. Mix gently. Add yogurt mixture and mix gently. Sprinkle with paprika, if desired. Serve immediately. Makes 8 servings.

Fauquier Times-Democrat newspaper

Southern Sweet Potato Salad

As long as we are exploring different potato salads you might like to surprise everyone with a potato salad made of sweet potatoes. Now before you turn this recipe down, give it a try.

2 pounds sweet potatoes, peeled and cut into 1/2-inch cubes
2 tablespoons lemon juice
1 cup mayonnaise
2 tablespoons orange juice
1 tablespoon honey
1 teaspoon grated orange peel
1/2 teaspoon ground ginger
1/4 teaspoon salt
1/8 teaspoon ground nutmeg
1 cup sliced celery
1/3 cup chopped dates
1/2 cup chopped pecans
lettuce leaves
1 can (11 ounces) mandarin oranges

In a medium saucepan, cook sweet potatoes in boil salted water just until tender, about 5-8 minutes. Do not overcook! Drain well, toss with the lemon juice. In a large bowl combine mayonnaise, orange juice, honey, orange peel, ginger, salt and nutmeg. Add the warm potatoes, celery and dates. Toss gently to coat well. Cover and chill. Before serving, gently stir in the pecans. Spoon salad onto a lettuce-lined platter. Arrange mandarin oranges around salad. Makes 6-8 servings.

Taste of Home magazine

Crunchy Brown Rice Salad

Tired of potato salad? Tired of pasta salads? OK – we'll finish up with a rice salad.

1 cup frozen peas
2 cups cooked brown rice
1 cup diced tomato
1 cup shredded carrot
1/2 cup diced Jerusalem artichokes (optional)
1/2 cup fresh bean sprouts
1/2 cup sliced green onions
1/4 cup crumbled blue cheese
1 tablespoon plus 1-1/2 teaspoons lemon juice
1 tablespoon vegetable oil
2 teaspoon Dijon mustard
1/2 teaspoon honey
1/4 teaspoon salt
1/4 teaspoon ground white pepper
1/8 teaspoon ground red pepper

Cook peas, but do not overcook. Drain. Combine peas, rice, tomato, carrots, Jerusalem artichokes, bean sprouts, and blue cheese in a large bowl and set aside. Combine lemon juice and remaining ingredients in a jar. Cover tightly and shake vigorously. Pour over rice mixture and toss well. Cover and chill for at least 3 hours. Yield 10 servings.

Cooking Light Cookbook
ed. Oxmoor House

Now you are all set for potlucks and family dinners. Remember to share honey recipes with all your friends. But more important, share honey recipes with new acquaintances at summer picnics.

Shaking Bees

by
dick bonney

Among the list of standard questions that every beekeeper hears so often is "how do you get the honey out of the hives?" After doing it once or twice, we come to think of this as routine, really nothing to think about actually. However, it can be a perplexing question to someone who has never had to deal with it. So – how do we get the honey from the hive?

The simplest way is shaking and brushing. Basic, perhaps, but surprisingly effective and requiring a very minimum of time and equipment. Other methods exist but we won't deal with them today, especially since these other methods often require that they be supplemented with some shaking and brushing. Let's get that down pat.

First, the equipment. A conveyance of some sort is a must – a wheelbarrow, a garden cart, a pickup truck, even a coaster wagon – any of these will do. Whichever it is, you will want to bring it up to within a few feet of your hive as you take the honey off. In it, plan to have an empty super or hive body. If you are using a wheelbarrow or anything else that does not have a flatbed, then place a spare outer cover under the super, inverted, so the super will be sitting on a flat surface. If you don't have a spare cover, just a wide, flat board will do. The idea is to keep bees from sneaking into that super from underneath after you have started putting frames of honey in it. If you don't have a hive body, then improvise. Actually, any sturdy box will do. You just need a *beetight place* to stand the frames from the first super you remove, after the bees have been cleared.

Next, have a bee brush – a real bee brush, that is, not a handful of long grass as is sometimes suggested since we will be doing a lot of brushing. Grass or other makeshifts do not stand up to the job. Then, a damp towel, to serve as a temporary cover for that super we just talked about. Let it be bath size, and maybe have more than one towel, if you have several supers to take off. The balance of equipment will be what you use routinely whenever you work your hive – smoker, hive tool, and so on.

Plan to take your honey off on a nice day when the bees are flying and nectar is still available. You want them to be preoccupied with foraging, and not hanging around the hive waiting for you. This suggests that you are taking your honey off before the season is over, generally a good idea. The bees can then use the tail end of the honey flow to fill all the nooks and crannies in the hive bodies. It also gets all those supers out of the way – the ones that may have deterred you from getting down into the broodnest for a good inspection. How are things really going down there, anyhow? Full supers above do not guarantee full hive bodies below. Many beekeepers have taken off their honey at the end of the season and discovered that little or nothing was stored below, in the broodnest. Find out early enough so you and the bees can recover.

Now that you have everything ready, light your smoker and put on your veil. Once you are confident that the smoker is burning well, put a handful of green grass on top of the fuel, under the lid. This will act as a filter to hold back any smoker debris that might puff out through the spout and into your supers. Such debris would later be strained out of the extracted honey as you process it, but why let it in to begin with? This is even more important if you are

The shake & brush set up. A super, or some other device ready as a work/holding surface; a board in front of the colony to brush bees onto; a cart to transport harvested frames; and a 'holding' super to receive the harvested combs, complete with a wet-cloth cover.

dealing with comb honey Sooty debris from the smoker can be embedded easily into the nice, white cappings by the brushing process.

Since we are thinking about smoking, let's diverge a little here and consider what happens when you smoke the bees. Some of them move away from the smoke. It is possible to start them down and out of the top super, into the super below, with some vigorous smoking. You can't empty the super, but you can get them started. However, it takes a bit of smoke to do this, and you will still need to do your shaking and brushing, so it is not really worthwhile to smoke heavily. Don't try to move the bees with smoke. The other thing that happens is that some of the bees are stimulated to engorge on honey. If you are dealing with nice, capped comb honey, you do not want the bees to start uncapping those cells. The less smoke the better. Use your smoker judiciously and work quickly.

Now you are ready to begin. Have your wagon or cart conveniently nearby, within just a few feet, with the empty super ready and the damp towel draped over it as a cover. Open the hive as you do normally Remove the inner cover and the top honey super. Set the super down next to the hive on the inverted outer cover or on a spare hive body. Replace the inner cover on the hive – this helps the bees in the hive stay calm as you work on that first super outside.

Remove a frame from the super. Presumably, it is full of honey and covered with bees. Let's consider that honey for a moment. As you proceed, you may find that some of the cells are not capped. This does not mean automatically that the honey is not ripe. Towards the end of the season especially, the bees may not cap all of the honey even when it is ripe. My rule of thumb is that if a frame or a super is two thirds capped, it is ripe. Even if less than two thirds is capped, all may be ripe. Check it. Hole the frame horizontally and give it a shake. Nectar or unripe honey will spatter out of the frame. Ripe honey will not.

Another check is to taste.

First, remove the top honey super and place on the 'holder' Replace the inner cover on the colony to keep bees at home.

Stick your finger into the suspect honey and, after moving your veil aside of course, put that finger in your mouth. If the honey tastes good, it is good. If any of it is not ripe, leave it with the bees for a couple more days.

Now, with the frame of ripe honey in hand, grasp it firmly by both ends and hold it in front of the hive, over the entrance. Give the frame a good, strong downward shake, once. Bees will fall off, sometimes many, sometimes few. Take what you get with that one shake. Don't shake repeatedly

Close-up of the receiving super with honey frame already inside and the damp-cloth cover. Almost any bee-tight cover will work though.

Continued on Next Page

To remove bees, lift out frame and recover colony. Hold frame over the board in front of the colony.

Gently brush bees off the frame. Use a real bee brush that's kept clean on occasion. Bees will fall onto the board and run back inside.

SHAKING ... Cont. From Pg. 469

Next, holding the frame with one hand, still over the hive entrance, brush the remaining bees off. Brush firmly but gently, and work as quickly as possible.

You could, of course, shake and brush the bees into the top of the hive, but then you would have to cope with them again as you remove the next super. Further, by putting them back in the hive, you have placed them on their home ground where they can get reorganized more quickly. You want them to stay confused and disoriented for a while. Generally speaking, they don't get upset by shaking and brushing, but that is at least partly because of the confusion.

Depending on the nature of your hive stand and the ground in front of the hive, you may wish to put something down at the entrance to shake the bees onto so they're not just dumped in the grass. A piece of plywood, or cardboard, or smooth fabric will do.

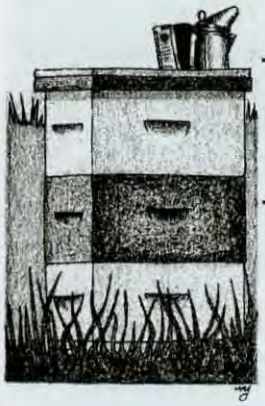
As each frame is cleared of bees, take it quickly to your cart or wagon and place it in the waiting super. Cover the super with the towel. The reason for specifying a damp towel is to give it a little weight so it will remain snug and beetight over the super. Proceed one at a time with the rest of the frames. When the first super you took off is empty, shake and brush any remaining bees from it and set it on top of the just filled super, under the towel. It is now ready for the frames from the second super to be removed.

This process of shaking and brushing puts many bees into the air, and of course, the odor of honey will be in the air, as well, some of those bees are going to start searching for the source of that odor. If you give them the opportunity, they will find the supers on your cart and start to recover their honey. Keep everything well covered, and again, work quickly This problem becomes especially acute if there is no honey flow in progress. The bees are idle, and scouts and then foragers from every hive in the neighborhood will soon home in on your activities.

If you have been experiencing an especially good nectar flow, and if the bees were at all cramped for storage space, you may find that a lot of honey-filled burr comb is joining your supers together at the tops and bottoms. This makes for a messy removal, since this comb tends to break and ooze and run as you proceed. Brushing bees from these areas spreads that oozing honey and generally makes a sticky mess. Bees can become glued to the brush and to the frames. If the brush gets badly gummed up, keep a pail of water handy for rinsing it. Shake it well after rinsing. I find that a damp brush is much easier to work with than one covered with honey.

To further relieve this problem, it can be helpful to go to your hive the day before you plan to remove the honey and do a little preparation. Remove the supers from each hive and then immediately replace them, each one's position reversed relative to those over and under. Doing this breaks that burr comb and gets the honey exposed and running. The bees will proceed to repair the damage, but tend to store the honey elsewhere in the hive. You then won't have to cope with it on removal day.

Once the honey is off, get it away from the beeyard quickly and into a bee tight space, preferably indoors where the bees can't smell it. Remove any temptation. It is amazing how much of that honey the bees could cram back into their now much smaller hive if you gave them the opportunity. BC



BEE TALK

richard taylor

"I had never, in my long life of beekeeping, lost an apiary."

This spring I came upon one of the most dispiriting sights a beekeeper can encounter: A dead apiary. One of mine. Not a single hive had survived, not a single bee. The yard was as silent as the death that encompassed it.

We are all accustomed to losing a few hives to the winter from time to time. Sometimes I have gotten through the winter without a single loss, but I never really expect things to be quite that good and, since the mites became a problem, the risk of loss has of course increased. But I had never, in my long lifetime of beekeeping, lost an apiary. This one, moreover, was my favorite yard. I have harvested enormous quantities of comb honey from these hives over the years. And it is a perfect setting for bees. Some sort of building once stood there, and now all that is left is the foundation of it, a huge slab of concrete about two feet thick, large enough for 25 or 30 hives. This is surrounded by a jungle of trees and brush that have taken over, so that the apiary, though it is only about 40 feet from the road, and right on the edge of the village, is quite invisible to passers by. Oh! The happy hours I have spent there, seeing the thousands of bees cascading down from the opening of the vegetation overhead and into their hives, while more thousands rose into that opening and scattered in every direction, gathering nectar. I was so near to the busy comings and goings of the village, and yet, so totally alone with my bees.

I saw the apiary begin to decline last summer – something I had never seen before. Mites, of course – doubtless *Varroa*. I got almost no honey crop there at all. Then I used the Apistan strips, but it was too late.

Now, spring was here. What to do about this apiary? I never buy package bees. My policy has always been to restore dead colonies by making up nucs. So I just figured I would do that again, getting the nucs from the strong colonies in my other apiaries.

But then began another spell of deep misfortune. I always get my queens from a good beekeeper friend. He includes my order along with his own. And this year he chose a new queen breeder, one who advertised his queens as especially bred to be *Varroa* resistant. So I ended up with a dozen of these special queens. And that was really bad luck. Queen acceptance was extremely bad, and the few that did get accepted were mostly drone layers! Moral: Don't be taken in by the grand claims of someone you've never done business with. Stick to the tried and true, and let others be the experimental guinea pigs.

So there still stood my dead apiary I didn't even want to think about it. It was too late now to be making up nucs. But I had to do something. I thought of the preacher's exhortation in the book of Ecclesiastes: "Whatever thou findest at thy hand to do, do it with thy might!" I was willing to heed that, but the trouble was, I was unsure what it was that I had to do.

I figured I had to bring all those hives home and do something with them, before the mice and vermin took them over, so one day I set out to do that, mustering my might to the depressing task. But after I loaded up the first hive, I asked myself – now what am I going to do? Take all these hives home and stack them in the barn with paradi crystals? That has never worked well. Set them all outside on their ends, exposing the combs to light and ventilation? That works all right for awhile, but you can't leave them that way indefinitely, and besides, I had no place to do that. You really need to build a special rack for that kind of storage screened against mice.

Then my thinking took a brand new turn. I drove back home, got on the phone to the bee company in Alabama where, year after year, I used to buy all my queens. He had always delivered the goods, right on time, and I knew I could trust him. I asked him to send up ten packages. He said he'd get them off that day, and I would have them Saturday. True to his word, there they were on the loading dock at the post office early Saturday morning, every package full measure, and all installed in the hives soon after.

Now my favorite apiary is alive again. Only ten colonies, to be sure, but I'll build it back up. I don't expect much of a crop there this year, maybe none at all, because I should have stopped that fooling around and gotten the packages weeks ago. But at least, it is no longer a dead apiary. It is a *liv* one. What a difference! And wha a difference to my whole outlook on life. BC

Questions?

What's Wrong?

Q **I was cutting weeds in front of my hives when I found about three pounds of bees in the grass in front of one of the hives. What is the explanation of this?**

Donald Stambaugh
Prestonsburg, KY

A I believe that what you saw was a colony of bees being driven from the hive by a severe infestation of tracheal mites.

Editor's Note: Another possibility, depending on the time of year is loss due to exposure to pesticides. To try and find out what's going on we suggest looking at the remaining bees for tracheal mites (use the tracheal pull and a small hand lens), or send a sample (or have your inspector collect one) to be tested. Second, scoop up a pint or so of the dead bees and get them to a freezer – fast. If this is only one hive, make a note, but check other hives that are close. Then notify your inspector.

Feral Bees

Q **I keep hearing that there are no feral (wild) honey bee colonies left, yet bees kept in hives still swarm, as always. Do these swarms not then become feral colonies, unless recovered by beekeepers?**

Matt Ter Molen
Evanston, IL

A It is certainly an overstatement to say that there are no feral colonies left, yet there is no doubt that their numbers have been greatly reduced by parasitic mites. I used to get many requests to recover stray swarms, but I get almost none anymore. The encouraging side of this is that the feral colonies that remain tend to be mite-resistant, and beekeepers are therefore encouraged to set out bait hives and take whatever other steps they can to get swarms from feral colonies.

Gone Bees

Q **My observation hive became suddenly deserted at the beginning of September, after I had been away for a week. Why would the bees leave so late in the year?**

Jean-Claude Bourrut
Jamaica Plain, MA

A That was probably a "hunger swarm" (sometimes called absconding). An observation hive is not strong enough, or large enough, for the bees to store a surplus of honey, so when the nectar flows cease, as they do in August, their honey is soon used up and the bees abandon the hive in desperation. The solution to this is to keep a close eye on them and be ready to supply sugar syrup when needed.

Fall Food

Q **This is my first year with bees. I began with a five-frame nuc and they built up strong. In the fall they stored lots of golden rod and aster honey, which I left with them for winter stores. Now I have read that golden rod and aster are poor winter stores and that I should have extracted it and fed the bees sugar syrup. Is this true?**

George Piper
Torrington, CT

A My bees always winter over on golden rod and aster. There is nothing wrong with these sources for winter stores, and I am very certain that honey, from whatever source, is bound to be better than sugar syrup.

Apistan Strips

Q **I have discovered that my bees have Varroa mites. Are there any treatments for this that are easy and less expensive than Apistan?**

Allan M. Steigerwald
Port Angeles, WA

A As of now Apistan is the only treatment that is generally approved, easy to use and known to be effective. There appear to be problems with other acaricides. Use one strip/every five frames of bees, (thus, a brood box with 10 full frames would use two strips; or two brood boxes with nine frames combined would use two strips in the two boxes), after brood rearing has ceased or nearly ceased, in the fall, and after you have harvested your honey, insert them between combs in the closest proximity to where the bees cluster, but separated by two or three combs, and leave them there for the time stated on the label. It is not recommended that they be left in the hives all winter.

Moth Balls

Q **I have some beehives that the bees died in last year with comb honey. I put moth balls in them for storage. If I put new bees in them will this kill them?**

F.J. Lolmaugh
South Bend, IN

A It would probably not kill the bees to put them in equipment that has been exposed to moth balls, but the odor is repellent to bees, and would also contaminate any comb honey exposed to them. Moth balls (napthalene) are not approved for use with bees in any way.

Please send questions to Dr. Richard Taylor, Box 352, Interlaken, NY 14847, enclosing a stamped envelope for response.

Answers!

Richard Taylor

?Do You Know? Answers

1. **False** A brand melter is used to liquefy wax from cappings after they are removed from honey combs.
2. **False** The best time to remove excess moisture from honey is while it is still in the comb. Honey supers removed from colonies should be stored in warm, dry areas. The amount of moisture removed will be related to the relative humidity and volume of warm circulating air.
3. **True** U.S. Grade A honey cannot contain more than 18.6% moisture. Because of this standard, honey with a higher moisture level is always disqualified when entered in a honey show.
4. **False** Froth on the honey surface is not an indication of fermentation rather the incorporation of air during the extraction process and filling of containers. Honey should never be allowed to fall any distance or honey pumps allowed to suck air.
5. **False** In the production of chunk honey, the liquid honey should be heated to 140°F and then cooled before it is poured over the comb pieces to delay granulation.
6. **False** The honey extractor uses centrifugal force to spin the honey from the cells.
7. **False** The cracking and shrinkage of beeswax is an indication of wax cooling too rapidly rather than overheating.
8. B) 75% Capped
9. C) Refractometer
10. Straining liquid honey through cheesecloth.
11. Using baffles in a sump tank to capture impurities.
    Straining liquid honey through a fine mesh material such as nylon.
    Use of a settling tank, skim impurities from the top after allowing the honey to stand for several hours.
12. Use of a bee escape or escape boards.
    Shake and brush bees from individual combs.
    The use of chemical repellents and fume boards.
    Blowing bees from honey supers with a bee blower.
13. Liquid honey that has not been filtered (limited straining) or heated above 95 to 100°F
14. Honey is heated to dissolve any sugar crystals that have been incorporated during the extraction process to delay granulation and to kill the yeast cells that are present that cause fermentation.
15. Radial Extractors
    Tangential Extractors
    Merry-Go-Round Extractors
16. If the extractor is initially turned too rapidly, the weight of the honey may break the combs and the combs will be thrown from the frames.
17. Vibrating Knives
    Heated Knives (hot water, electricity, steam)
    Rotating Chain Flails
    Rotary Knives

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

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

Gleanings

AUGUST, 1994 • ALL THE NEWS THAT FITS

NHB NEW OFFICERS

Seated (left to right): Steve Klein, Marshall, MN; Neil Miller, Blackfoot, ID; Binford Weaver, Navasota, TX; Mike Ingalls, Sultan, WA. Standing (left to right): Jill Clark, Lancaster, PA; Dave McLure, Littleton, NH; Bill Shearman, Wimauma, FL; Shirley Miller, Salt lake City, UT; Don Folkema, Fremont, MI; Marjorie Ehry, Dundee, OR; Bobby Coy, Jonesboro, AR; David Allibone, Sioux City, IA; Barbara Stockwell, Ariwaca, AR; John Miller, Gackle, ND; Robert Appel, Manville, IL; Doug McGinnis, Edgewater, FL; Larry Krause, Riverton, WY; Steve Conlon, Proctor, WV; Ed Doan, Hamlin, NY; Bert Belliston, Heyburn, ID; Bob Doyle, Bellevue, WA; Randy Johnson, Nampa, ID; Hans Boedeker, Tustin, CA.

The National Honey Board elected Neil Miller, Blackfoot, ID, as its new chairman during the Board's annual meeting in Denver, June 17. Randy Johnson, Nampa, ID, was elected as vice chairman and Steve Klein, Marshall, MN, was re-elected as secretary/treasurer. Two additional members, Binford Weaver, Navasota, TX and Larry Krause, Riverton, WY, were elected to serve on the Executive Board's Committee.

The Executive Committee is responsible for the conduct of duties and policies outlined by the National Honey Board. The Board administers an industry-funded national research, promotion and consumer information program to increase domestic honey consumption and U.S. honey exports.

The new officers have combined experience of over 150 years in the honey industry. Chairman Miller is president of Miller's Honey Farms, Inc. with honey operations based in Idaho, North Dakota, California and Mississippi. He has over 40 years experience in the honey industry. Miller previously served as vice chairman of the Honey Board.

Vice Chairman Johnson is a beekeeper with 19 years experience in the honey industry. His company, Honeygold Corporation, operates 7,500 hives for crop pollination and honey production.

Secretary/Treasurer Klein has over 25 years experience in the honey industry. He owns and manages 1,800 bee colonies, along with a specialty mail-order honey business.

Executive Committee members Weaver and Krause complete the new slate of executive officers. Weaver has over 45 years experience in the honey industry and previously served as chairman of the National Honey Board. Krause is a third-generation beekeeper and has worked in the honey industry for 27 years. His company, Wind River Honey Company, manages 2,800 bee colonies for migratory pollination and honey production.

Send Your Meeting Notices to *Bee Culture* at least two months in advance and we will publish them.

AMA STEPS UP

The American Mead Association (AMA) has changed its newsletter format into the quarterly full color magazine called *Inside Mead*, filled with exciting information on honeys, yeast and fermentation data, and recipes.

AMA Membership is $15 per year and includes a subscription to the quarterly *Inside Mead*, featuring articles, tips, recipes, and information on the history of mead; and to the *Meadmaker's Journal*, the annual "brewside" mead reference bible which also includes winning recipes from the Mazer Cup National Competition in Michigan.

Members also receive the AMA MemberCard, which enables members to receive discounts on equipment, supplies and mead merchandise from homebrew shops and mail order companies across the U.S. Members can receive phone support on meadmaking and other mead questions, such as how to enter National Mead competitions, where to find commercial meads, initial steps in opening a meadery, and much more.

For more information contact the AMA at (800) 693.MEAD, or write to AMA-K64, P.O. Box 4666, Grand Junction, CO 81502.

HELPING POLLINATE TOMATOES

Entomologist James Tew of the Ohio Agricultural Research and Development Center examines a honey bee colony in an OARDC greenhouse. Tew and Dave Ferree, a professor horticulture, are testing a chemical attractant to see if it lures honey bees to tomato blossoms.

While field tomatoes are mainly pollinated by the wind, greenhouse tomatoes need some sort of supplemental pollination. The problem with using honey bees for this has been that tomato blossoms are not very attractive to the bees.

Tew and Ferree are working to develop a chemical pollination attractant. Tew says that such a compound would be commercially useful to greenhouse tomato producers.

The American Beekeeping Federation needs your support in efforts to stop adulteration, improve marketing conditions & encourage research on African Bees & Varroa & Acarine Mites. For information, membership application & sample of bi-monthly News Letter write: The Amer. Beekeeping Fed., Inc., P.O. Box 1038, Jesup, GA 31545-1038.

Irish Beekeeping. Read An Beachaire (Irish Beekeeper) Month. Subs. $15./yr, post free. Seamns Reddy, 8 Tower View Park, Kildare.

Amer. Pigeon Jour. Breeding & promoting pigeons for pleasure & profit. U.S.: 1 yr. $18; 2 yrs. $34; 3 yrs. $48. For. (U.S.); 1 yr. $21; 2 yrs. $40; 3 yrs. $57 First class & air mail rates on request. P.O. Box 278, Warrenton, MO 63383.

THE AUSTRALASIAN BEEKEEPER. Pub. month by Pender Beekeeping Supplies Pty. Ltd. Send request to: The Australasian Beekeeper, PMB 19, Maitland NSW 2320, Australia. Sub. $US 27 per annum, Surface Mail (in adv). Pmnt by Bank Draft. Sam free.

Rare Breeds Jour. Bi-month journal about exotic, minor & rare breeds of domesticated animals & owners. $18. (U.S.)/year, $24. Foreign; $2.50 for sam. Dept. Bee, HCR 1, Box 45, Hebron, ND 58638 (701) 878-4970.

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

British Bee Journ. Month copies 33p + post. $15/yr. U.S. Ann sub. post paid. 46 Queen St., Geddington, NR Kettering, Northants, NN14 1AZ, Eng.

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

AUSTRALIAN BEE JOUR. Month, SeaMail $27.50 (Aus.), AirMail $40.70 (Aus.). Victorian Apiarists' Assn Inc., Editor, Judy Graves, 23 McBride Rd., Upper Beaconsfield, Victoria, 3808, Australia. Sample $3 (Aus.) on request.

Animals Exotic & Small If you are interested in animals you should be reading Animals Exotic & Small. This Bi-Monthly publication tells you about ways to supplement income, how-to-articles, includes unique catalog section & yellow pages of who's in the animal industry. 96 pages of valuable info! Send $3 for Sample or $21 for annual sub. U.S. or $36 outside U.S. MC, VISA & Phone Orders Accepted! Animals Exotic & Small, 1320 Mountain Ave., Norco, CA 91760-2852 (909) 371-4307

The New Zealand Beekeeper. Quar. magazine by Nat. Beekeeper's Association of NZ. Write for rates & indicate airmail or surface mail. NZ Beekeeper, P.O. Box 4048, Wellington, NZ.

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

BOTTOM ... Cont. From Pg. 480

taking away by force or threats such as in the classic bank robber's line, "Gimme your money or I'll shoot." Robbing also evokes an image of a group of thugs wandering streets (or neighborhood hives) in search of "easy money" (in this case "easy honey") – "easy money" referring to people who have their guard down or are too frail to fight back and therefore, make an easy target for thieves.

Instead of robbing, one might find honey bees, "begging for entrance." "Begging for entrance" is a phrase often associated with drunken Canadian youth coming home after Mr. Molsen's brew night. Wandering in the dark with no light to guide them, they knock upon the closest door until a kind soul lets them in to sleep off the intoxication. The neighbor of this "kind soul" is often heard using the phrase in the following way, "Look at those bums, begging for entrance. Why, it's a disgrace. They should never have been out this late." Unlike honey bees though, the Canadian case isn't a permanent situation.

Then there is the nuptial flight – a phrase the same gang of drunken Canadians are known to use. "Nuptial flights" is the equivalent of flying to Las Vegas and being wed to a woman one regards as an outright queen among women (yes, even Canadians get married in Las Vegas). After the wedding ceremony comes the "honeymoon," followed by a one-year period where the newly married couple finds the beekeeper's vernacular a source of stomach-turning expressions of LOVE. "Honey, will you be a sweety and please get me a towel?" and "Honey-droplet !, Sweetness, come here for a moment," or, as is heard when calling a spouse, "Honey-bun, honey-bunny!"

Two, perhaps three years later, after all the sweet talk has turned sour from overuse, one finds the same couple exploiting other beekeeping phrases such as, "How much money I have in my account is none of your beeswax!" How the word beeswax has become identified with concern is a mystery. Perhaps, one night before a beekeeping beeswax contest, an apiarist caught a competing colleague looking under a hive cover. "Hey, get out of there" the apiarist called out, "that's none of your beeswax!" instead of exclaiming the often used phrase, "none your business" and it just caught on. Anyway, it could be true.

Beeline is somewhat easier than beeswax. For thousands of years humans have observed the trait of flower fidelity among honey bees. They've noticed honey bees fly from flower to flower and then return directly to the hive, hence the word beeline which means, "go as quickly and directly as possible to." The married couple mentioned above might have used the expression like this, "Fine, if you feel you can't live up to, 'to love and to cherish' I'm making a 'beeline' for mother's house!" The latter usage is only one of many possibilities. The spouse may have said something like, "I'm making a beeline to the damn bank," or in extreme cases as in the earlier "robbing" example, "Gimme your money or watch this bullet make a beeline for your wallet!"

"Beeline" is not the definitive last word in the beekeeper's comedy of vernacular, nor is, "none of your beeswax." "What, there's more?" Yes, of course there is. Next week, a beekeeper might tack up a sign close to the apiary like this one, "Beewarebees" and a new word will bee born. One never knows what to expect – the English language is full of surprises. BC

Display Index

Canadian Conversations

franjo goluza

The beekeeper's vernacular isn't exclusive to people who practice the art of apiculture. Words and phrases spoken by beekeepers and their families for hundreds of years are found threaded in the English language tapestry in surprising, often humorous ways. Here are some typical examples.

Overheard in a shopping mall in Victoria, British Columbia – "What is wrong with you," an elderly woman scolds, tugging on the vociferous child's leash, "Have you got a bee in your bonnet?"

Immediately one has to assume "A bee in your bonnet" implies that the child is frightened. Our premise is that in Scotland women used the phrase to indicate hysterics based on the supposition that if you had a bee in your bonnet you would go berserk for fear of getting stung. This is paradoxical in that Scots, especially Scottish women, are known worldwide for their admirable history in beekeeping.

One often used phrase is the "spelling bee." No, Professor Karl Ritter von Frisch never took honey bees that far. The bee in "spelling bee" is actually a homograph (meaning one of two or more words having the same spelling but different meanings, origins or pronunciations) and has nothing to do with beekeepers anymore, but the phrase can still be considered here. At one point in history, one can assume (based upon the current homographic meaning of the word bee) that "bee" was first used in the context of "spelling bee" in relation to hard work. Children, one supposes further, worked as hard as a bee to remember hard-to-spell words. That's not to imply that bees once knew how to spell but can't anymore – it's just to say that children worked as hard as honey bees, nothing more. The homograph of hives also falls into the same category. One doesn't contract "hives," one obtains them from a local beekeeper. No, now that's not right. One obtains beehives from a beekeeper; "hives" in the former sense are the result of an allergic reaction.

Another word, "swarm," is fast becoming anomalous. Grade 11 biology students might use the noun to mean a group of free-swimming, single-celled organisms, especially relating to zoospores, while the elderly woman at the mall might use it concerning a larger gathering or group of people. She might say, "The swarm is coming this way," or "Let's leave now to avoid the swarm." For the beekeeper, "swarm" is a four-letter word handed down from generation to generation not unlike "damn," an expletive that also holds varied meaning – three of which are, declare to be bad, cause to ruin and condemn to hell (damn is mentioned here only as part of the official beekeeper's curse).

One word that could easily elicit the word "damn" from an amateur beekeeper is mobbing, as when a new queen isn't accepted into a colony, surrounded in a tight mob and injured or killed (Why? – well the amateur learns he or she hasn't rid the colony of the old one). In Canadian English "Mobbing," also refers to a gang of criminals or a group or class of people lacking culture and judgement. Any "mob" of honey bees trying to kill its queen, notably in this case, is sowing seeds of demise and therefore must certainly lack judgement. In another respect, it's a crime that for an amateur a queen costs more and more every year. Culture is another matter, however. One could argue honey bees are a cultured lot in that they have – arts, such as golden frames of American Linden honey, habits, such as storing the most precious liquid on earth next to water and institutions, as sacred as any monarchy in existence, etc. One cannot ignore endeavors like these when defining culture. However, one musn't digress too far. "Mobbing," as associated with beekeepers, is a word with as much dignity as a rat in a sewer pipe. It's no wonder the word has come to have criminal connotations. The verb, "Robbing," is of equal character.

Originally, robbing is an Old English word (Old English is the language of the English people up to 1100 A.D.). It's still used by beekeepers to indicate stealing honey by honey bees – occurring when a hive is weakened by disease to the point incapable of defending its stores from marauding bandits. "Robbing," as defined by today's linguists, denotes stealing,

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