AUG 1997

Bee Culture

Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

August 1997 VOLUME 125 NUMBER 8

FEATURES

Honey House, Pg. 36

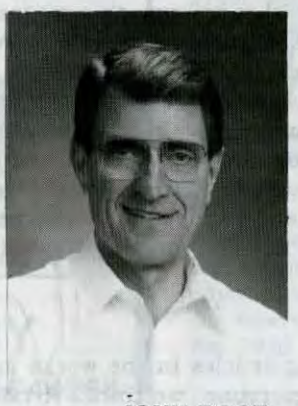
COVER

Late Summer annuals are a homeowner's, beekeeper's, and honey bee's delight. The last burst of color, and the last drop of honey go hand-in-hand.

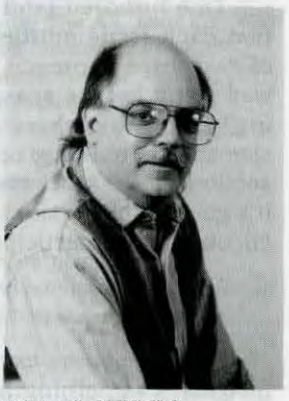
This exceptional photo is by Gard Otis, from Guelph, Canada. He is a researcher at the university there (he was one of the speakers at the Michigan Symposium) and in his spare time produces postcards with a beekeeping theme. I can imagine they do well.

DEPARTMENTS

COLUMNS



JOHN ROOT
Publisher



KIM FLOTTUM
Editor

INNER COVER

I recently presented a piece on these pages on the future of beekeeping being out West, specifically California. My intent then, as now, was that big-business beekeeping would be centered in that region of the country. I don't think that will change because the environment, the climate and the geography certainly favor growth there. But not only there.

Two basic changes will occur in the next several years that will favor beekeeping business in the North, along with the West.

First, Summer and Fall requeening will become, must become more common. To facilitate that, Summer and Fall queens must be raised. Spring-banked queens just won't do, or at least do-as-well. You can raise Summer and Fall queens nearly anywhere North of the Mason-Dixon Line. Good queens, good lines and good quality bees to raise them.

Early queens, or packages for that matter won't work up here, though. But early splits will. Early nucs will. But queens to go with them might be hard to come by. Which brings me to the real reason I'm writing this.

Elsewhere in this issue I write about a gathering of topnotch scientists and the results of their work. If you read that article you'll note one important fact – there's not *ONE* piece on how to manage bees. There's DNA stuff, and lots of other stuff, but not one piece, not one research project on where queens will come from for May. Those scientists aren't interested in queens in May because for them life-as-usual will continue, and their work won't be affected – no matter what.

And a couple of those pieces show quite conclusively that once an area is exposed to AHB genes, it's all over but the shouting as far as raising pure European bees is concerned. Yes, you *can* manage AHB, but you can't ship them north. So there are, and will be more, folks out there in the north who are raising Summer queens, producing packages later in the season and learning to manage bees for later-season production. I've met them. They're letting the world know they exist (through ads and articles in this and other journals) and are working to make beekeeping work for them . . . and you.

Life in the near future may not be what it is today, but it will work, and we will flourish.

Be prepared.

•

One hundred (and more) years ago, this magazine had a section each issue entitled 'Encouraging Reports.' It was comprised of two-three sentence reports on how the season, and the crop was going for the season. How is *your* crop, and *your* season going? Send us a short report. Crop size, bee health and anything else that is making, or breaking your season. We'll run a special section, if we receive enough reports, to let everyone know how it's going. Hobby, sideline and commercial beekeepers are *strongly* encouraged to participate. Let everyone know what's happening.

•

We have some exciting articles in the works for the next few months – something for everyone, we think. A visit to the Blueberry Barrens of Maine shows the second largest colony migration in the U.S. including visits with growers, beekeepers, inspectors and others intimately involved.

Three packers have given us an inside look at how their business is run – you'll learn a lot about this aspect of the industry here.

How well do plastic frames and foundation work? In a first ever side-by-side field test we'll show what we learned. And how about hive paint? Which is best? Our field trials compare costs, longevity and protection.

What about queens? Lots of discussion this year about commercially produced queens. What's the problem? Is there one? And what could producers be doing to improve?

Personal Profiles of beekeepers and researchers, current research on *Varroa* control, business management for big business . . . the list goes on. And *only* in *Bee Culture*.

Kim Flottum

Northern Exposure; Future Articles

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MAILBOX

Harmful Research

We read with much horror the article entitled Island Odyssey by Joe Traynor in the May 1997 issue of *Bee Culture* (Volume 125, Number 5, pages 25-28). We cannot understand the mentality of those who operate The Nature Conservancy or the University of California, Santa Barbara "research" team led by Dr. Adrian Wenner.

Santa Cruz Island is an environmentally isolated ecosystem located 25 miles off the coast of California adjacent to Santa Barbara, CA. This island, containing approximately 57,000 acres, has been used as a cattle and sheep ranch since the 1820s.

In the 1980s The Nature Conservancy, a private "environmental" organization acquired Santa Cruz Island with the express agenda to "return the island to its natural state, which means eliminating introduced species, including the honey bee." Such a program is ridiculous if not impossible. First, it is impossible to eradicate (i.e. completely and permanently eliminate) all species that were introduced to the island since European humans inhabited the island. In addition, native American humans of the Chumash tribe have inhabited this island for many centuries prior to European human inhabitation. The Chumash people undoubtedly changed the natural pristine state of the island. Indeed, the way that the Chumash people used the island will not be revived.

In the 1880s a beekeeper imported a strain of pure German Black bees to the island, *Apis mellifera mellifera*. Since this introduction, no other bees have been introduced to the island. It is believed that Santa Cruz Island now contains the *only* pure *strain* of *this bee race* in the world. This is because of migratory beekeeping practices throughout the world. Honey bees have been transported throughout the world, to every continent except Antarctica. Bees have even been transported into space. Interbreeding and crossbreeding has occurred in every place where bees have been kept. There are few places on this planet where pure strains of honey bees are to be found. Santa Cruz Island is one of these places. Even in northern Europe, the German Black bee has been hybridized with Italian bees, *Apis mellifera ligustica*, Carniolan bees, *Apis mellifera carnica*, Caucasian bees, *Apis mellifera caucasica* as well as other races of honey bees imported into Europe for breeding purposes, and by migratory beekeeper practices.

With current knowledge, it is known that the German Black bee is not as good of a honey producer nor is it as good of a pollinator (due to its relatively short tongue) as other races of honey bees. However, the knowledge of honey bee genetics is not complete and this race of honey bees may have genetic material not viewed today as of interest, which may be a recessive trait, that one day will prove to be beneficial to beekeeping.

It is not possible to transport this bee to mainland California, or other areas where bees are currently kept and keep the strain pure. Undoubtedly drone bees from other colonies will breed with Virgin queens from any German Black bee rescued from Santa Cruz Island, thus contaminating the genetic reservoir of this rare bee.

To make matters worse, Dr. Wenner has introduced *Varroa* mites to the island. Here we are told that The Nature Conservancy is interested in returning the island to the way it was before European humans saw the Island. But in doing so, they are introducing another animal species (the mite) that is not native to the Island. The logic of this is beyond rational thought.

We have wondered several questions. First, was an environmental impact report made of this project, and were the issues raised in our letter considered? Second, who makes these decisions about trying to return to the past? We are led to believe that The Nature Conservancy is an "environmental" organization dedicated to preserving land "the way it was." We believe The Nature Conservancy and Dr. Wenner needs to get a dose of reality. It is better to preserve parts of our planet in its "natural state the way things are" rather than trying to make time go backwards. In our time-space continuum, time goes forward, regardless of any actions we take.

We think The Nature Conservancy needs to re-evaluate their agenda. If it is their goal to go back in time and start over, then perhaps they should put their energy into building a time machine. One cannot undo the past, one can only go forward.

Debra Copple, Sr. Staff Biologist
Gregg Manston, Sr. Staff Ecologist
Bee Removers, Claremont, CA

ANP Comb Comment

Richard Bonney's article has spurred me to send a comment I had intended to make spontaneously. Having been wiped out by *Varroa* mite in the Fall of '95 when I got new packages I decided to believe the advertising for ANP being a physiological deterrent to the mite and used the plastic comb exclusively. I always look in three days after housing a package to look for eggs and found good looking queens wandering around cell to cell but not laying. In a week I looked again and still they were wandering looking but no eggs. I decided to break the system and put in one frame of wax comb and the next day it was full of eggs and in a few days there were eggs in the plastic too. I have repeated this experience this year. It seems they need a seed comb to get them to accept the plastic but that supposedly defeats the anti-mite system. There is also a widespread

Continued on Next Page

MAILBOX

spattering of higher caps on the brood suggesting irregular depositing of drone eggs, not like the natural format.

Malcolm Dunkley
Martha's Vineyard, MA

Doesn't Like Dents

I am at a total loss to comprehend how the Editor of such a fine publication could reduce his dignity, as well as that of his subscribers, to the level of the character in the cartoon "Smokey Dents."

For over 77 years, I have yet to meet a beekeeper this stupid! It's an insult to all of us.

I am certain this space could be utilized for something more informative and educational!

Arnold A. Bruck
Remington, IN

Bigger Is Better

Thanks to James Tew for his description of a device to enable a shopvac to capture swarms (May '97). After I built one I was contemplating its most obvious limitations, i.e., many swarms are considerably larger than the package box. A solution came to mind, namely, using two or three package boxes in sequence.

After filling one box, it can be removed from the "Tewbox" – better hurry with that patent application – its entrance hole closed with 1/8" hardware cloth and stowed in a deep hive body (on a bottom board and under an inner cover). Then a second (and a third if necessary) can be inserted into the Tewbox and the rest of the swarm captured.

One would expect the scout bees still flying would join their sisters in the hive body in the usual manner. By dark all the bees ought to be in and can then be moved. Next morning the inner cover can be removed and replaced by a super of foundation after removing the hardware cloth closures. Soon enough, all the swarm bees ought to be on the frames and the first hive box and package box(es) removed, ready for the next swarm call.

Now it will be just my luck that all the swarms referred to me will be hanging within easy reach and I'll not get a chance to use my new toy.

Dan Hendricks
Mercer Island, WA

Better Jig

Regarding my "top bar frame nailing jig," that was pictured in the April issue. There have been 86 requests for the free plans thus far. Plenty more on hand.

Novice beekeeper Sylvia Muth of Salisbury, VT has made an improvement to the jig. She made the base wider and added a side strip. Now after nailing on the frame top bar, then inverting it into the new slot, it steadies it for nailing on the bottom bar.

Smart move Sylvia.

Jim Morgan
5012 Perrine Dr.
Jacksonville, FL 32210

We Can't Wait

Mr. Carl Nults, page 9 of June issue of *Bee Culture* is right. We can't wait on Congress to take care of the mites for us beekeepers. Nor can we wait on the science work coming out in *Bee Culture*. We have cures already, but if we admit what we have, like Mr. Nults suggested we could get our honey condemned. Even though most cures are every day natural oils. Sorry Carl. What did you really expect of our esteemed Editor? Read his words carefully on page 9 Mailbox. Every word he speaks he shoves dollars in the pockets of big business. And those dollars are coming out of the pockets of us beekeepers when we buy high priced medication.

Samuel Martin
Eugene, OR

Yes . . . Sometimes!

An irritated caller asked: "How can you defend your opposition to the American Beekeeping Federation's (ABF) amendments to the National Honey Act that would authorize the funding for certain research projects?" I was pleased to receive the question, but, I have doubts that my answer was satisfactory.

The matter of funding research with Honey Board funds needs more attention than merely mentioning the point and assuming that everybody would approve. The much touted "summit meetings" that were sponsored by the ABF barely mentioned research funding except to promote a questionable clause that would regulate the percentage of the check-off assessments that could be spent on research in any given year. Is it reasonable to assume that the Honey Board members need a restrictive clause that would limit their authority on this matter? I think not. We elect them to manage the Board's affairs – why limit their authority?

I have no objections to the matter of using Honey Board funds for honey production research. However, I have some concerns about our ability and willingness to shape up a reasonable program. If the ABF is successful with their program to amend the National Honey Act, are we likely to get an extensive study of the grocery-shopping habits of Middle-East housewives, or will the funds go to honey production research? No responsible answer is available at this point, but, it is difficult for me to forget the opposing factions who fought the long and expensive (for both factions) battle on the antidumping suit against the People's Republic of China. Is there a probability that some future Honey Board member will question the propriety of trying to deal with honey packers, like former ABF president Don Schmidt did when he raised a question about the wisdom of allowing packers and importers to vote in the ABF. In a letter, dated November 1, 1994 he expressed concern about dealing with non-producers when he said:

"My personal opinion is that we should take action ASAP to take necessary steps to change our bylaws to eliminate the packers' and importers' right to vote in the ABF. They have proven beyond a shadow of a doubt that their interests are in direct conflict with that of the producers."

MAILBOX

Agricultural economists certainly agree with the last sentence in the above quotation. It is a point that we should keep in mind, while trying to satisfy the different factions that make up our industry.

There are a number of places where industry funds could be fruitfully used. As I understand it, most of the government research agencies would welcome "matching funds" for new or ongoing research programs. OK – this sounds good. What is the problem? The main problem, as I see it, will come when new projects are proposed. The industry is factionalized – not hopelessly, but certainly to a point that may develop into a major squabble. Under the present set-up where all Honey Board members are dyed-in-wool members of ABF, I have doubts that AHPA contributors will have any input whatever. We (in AHPA) might have some input if the Honey Board funds were to match a congressional appropriation. Consequently, AHPA must recognize the need for AHPA members to do some politicking for seats on the Honey Board and become involved in the nominations process. Continuing the political status quo where producers take a back seat should not be acceptable to any producer.

Using Honey Board funds for research is acceptable if:

- Producers authorize the allocation; and
- Beekeeping organizations clearly understand the need for the project.

A satisfactory solution for producers is to create a board of producers who collect funds from domestic producers and promote domestic honey. Mr. Producer, now is the time for you to make your views known. Can we count on you?

Glenn Gibson
Minco, OK

Bear Value

Why don' t you have an article on cooking bear meat?

Generally speaking, small bear is good eating, and older bear can be tough and strong. Here in Montana, there are lots of bears and fairly liberal hunting seasons. Enough of the bears here carry trichinosis (the majority of the older bears, I guess) that it is recommended to *always* thoroughly cook the meat. The Montana Department of Fish, Wildlife and Parks will analyze a piece of tongue or diaphragm meat for trichinosis. I don't know if the process of making jerky kills the trichinosis cysts.

Any size bear can get into somebody's beehives. Most of the bears that people will encounter are the two-year-olds. These are the young bears in their first year away from Mama, and they get into the most trouble. And those young bears are the best eating.

What I hear from old people around here is that bear grease makes the best pastries of any fat; my hunting buddy, who has been around a long time, likes it for boot grease. A neighbor of mine from years ago who was raised here and has eaten all kinds of game all his life, said that young bear was his favorite of any meat, game or tame.

As with any game, the handling of the meat after the animal is shot is critical. And it is best if the animal is not run very much before it is shot, for meat purposes. The bear that I got when I was a young fellow back East (New York State) was a mature male and ran about a 100 yards from his bed when I shot it. The meat was tough and strong. Very tough and very strong. Hardly fit to eat, actually. My grandmother was the only one who could cook it so it was fit to eat. And I don't know how she did it. I know she used meat tenderizer on it. If I knew an animal was going to be tough, I would just hamburger the entire animal.

An article on cooking bear meat would give those pests some value.

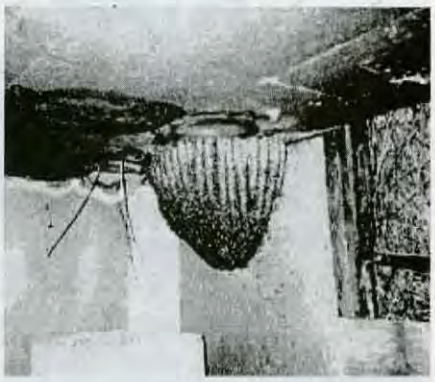
Ed Rittershausen
Polson, MT

Feral Swarm

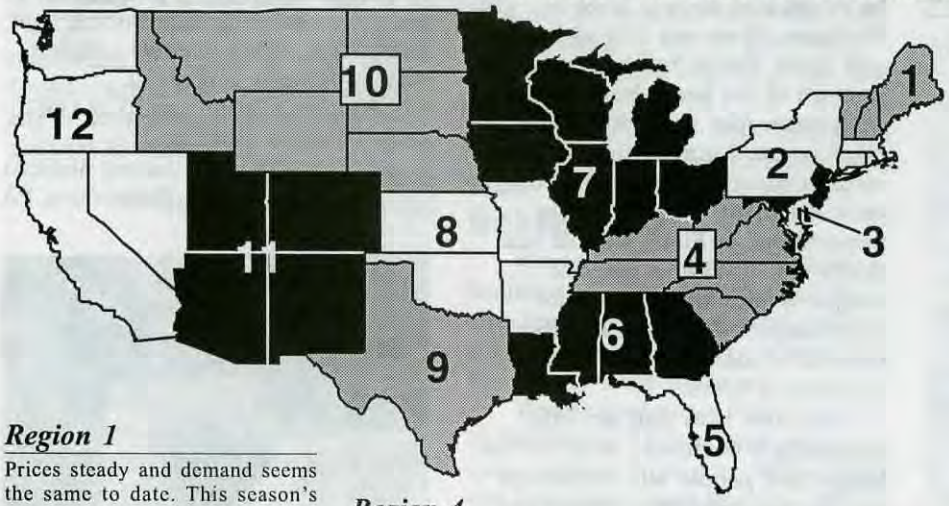
Photo #1 When I first discovered the swarm in late Summer of 1996. The empty beehive below it was apparently too small.

Photo #2 Early Spring of 1997 prior to apple blossom.

James Moreau
Emporium, PA



AUGUST – REGIONAL HONEY PRICE REPORT



Region 1

Prices steady and demand seems the same to date. This season's crop average to a bit up from average. Crops include clover, wildflowers, locust and sumac. Cold weather delayed the onset of the season, then a quick change to Summer speeded things up.

Region 2

Prices down at wholesale, but retail still going up. Demand steady. Crop average to a bit above so far. Clovers, berries, the crop so far. Cold spring, ants, skunks and swarming, swarming, swarming a problem so far.

Region 3

Prices all over the map since last month, with wholesale and retail changing in both directions. Crop above average so far. Clover main crop to date, and swarming and management for honey flow biggest problems so far.

Region 4

Prices down for bulk, up for wholesale and mixed at retail. Confusing picture. Crop average to a bit low so far, but cool spring held things back. Swarming a by factor in management this year. Tulip poplar and berries good crop.

Region 5

Prices up for bulk, stable for the rest of the products. A below average crop so far, with cool, wet weather a problem. Swarming and mites serious management problems. Saw palmetto and gallberry coming in.

Region 6

Bulk prices steady to down a bit, retail all over the map. About average crop predicted to date, but some spots slow. Tallow, clovers, wildflowers, sumac, tulip poplar and berries producing so far. Rainy weather, mites and swarming causing problems.

Region 7

Prices up to steady for bulk and wholesale, steady to down a bit at retail. Clovers, basswood, some canola and locust producing so far. But cool, wet weather, swarming, queens and mites not helping an only average to below crop, so far.

Region 8

Prices heading down a little across the board, but reports of strong demand at retail. An above average crop predicted, with persimmon, vetch, clovers, basswood and alfalfa strong crops. Fighting the weather (hot, cold, wet, dry) and swarming reported as problems.

Region 9

Prices steady at retail, bulk and wholesale mixed. Average crop, big crop, no crop reported, depending on location. Swarming a problem, but weather not helping. Too early to say.

Region 10

Prices steady as everybody waits to see what the crop will be, really. Some doing well in small lots, but big sales seeing a drop. Sweet clovers and alfalfa seem O.K., but weather early has hurt some, and good weather needed now.

Region 11

Both retail and wholesale climbing a bit. Loosestrife, clover and alfalfa some of the crops in the north, catsclaw, mesquite in the south. Mixed weather and mites a problem.

Region 12

Prices steady at bulk and wholesale, but climbing a bit at retail. About average crop so far, but dry may hurt. Clovers, star thistle, vetch, berries, manzanita, alfalfa reported coming in. Swarming, time, nosema and bad weather all have hindered production.

	Reporting Regions												Summary		History	
	1	2	3	4	5	6	7	8	9	10	11	12			Last	Last
Extracted honey sold bulk to Packers or Processors													Range	Avg.	Month	Yr.
Wholesale Bulk																
60# Light	66.63	68.40	71.10	65.80	75.00	63.00	67.26	76.50	71.10	71.10	69.67	65.00	50.00-95.00	68.30	67.55	58.57
60# Amber	63.34	65.35	68.01	65.65	55.00	61.50	64.53	63.67	68.01	68.01	65.00	63.25	49.20-90.00	64.83	64.24	56.71
55 gal. Light	0.91	1.07	0.88	0.94	0.84	0.97	0.99	0.97	1.00	1.00	0.90	0.92	0.83-1.23	0.94	0.94	0.88
55 gal. Amber	0.89	0.98	0.87	0.89	0.82	0.87	0.97	0.96	0.97	0.97	0.85	0.87	0.75-1.25	0.91	0.91	0.86
Wholesale - Case Lots																
1/2# 24's	30.02	29.09	34.21	33.43	34.21	35.83	29.08	30.33	34.21	34.21	28.75	27.13	24.00-48.00	30.64	29.11	27.17
1# 24's	41.11	41.13	42.81	40.93	52.00	40.90	41.95	39.83	42.81	42.81	43.77	42.46	32.40-54.00	42.03	43.09	38.25
2# 12's	36.80	39.09	36.90	38.45	43.00	31.90	38.09	39.20	36.90	36.90	37.60	34.00	24.80-48.00	37.90	37.39	34.73
12 oz. Plas. 24's	32.62	32.65	27.78	30.74	27.78	34.24	35.54	32.04	27.78	27.78	40.97	29.44	36.00-48.00	33.86	35.44	34.28
5# 6's	35.53	37.36	29.24	38.00	39.75	39.20	38.47	41.50	29.24	29.24	36.45	36.15	25.50-48.00	37.47	**41.22**	**35.52**
Retail Honey Prices																
1/2#	1.82	1.62	2.21	2.25	1.29	1.71	1.63	1.71	2.21	2.21	2.40	1.75	1.09-3.69	1.84	1.76	1.77
12 oz. Plastic	2.16	2.14	2.11	2.38	2.19	2.18	2.04	2.36	2.11	2.11	2.36	2.19	1.12-3.00	2.21	2.22	2.07
1 lb. Glass	2.77	2.57	3.43	3.32	2.32	3.04	2.49	2.86	3.43	3.43	3.03	2.64	1.99-5.50	2.79	2.67	2.50
2 lb. Glass	4.46	4.62	4.94	4.88	3.96	4.86	4.32	4.38	4.94	4.94	4.60	4.37	3.29-7.00	4.53	4.42	4.02
3 lb. Glass	6.00	7.13	6.35	6.42	4.99	6.45	6.14	5.67	6.35	6.35	6.30	5.76	4.65-8.25	6.16	6.08	5.08
4 lb. Glass	7.13	6.50	7.24	6.93	7.24	8.50	7.71	8.87	7.24	7.24	7.24	6.60	3.99-10.19	7.55	7.74	6.98
5 lb. Glass	8.48	8.67	8.02	8.77	6.75	9.50	8.47	9.54	8.02	8.02	9.41	9.19	2.25-13.00	8.80	9.06	8.34
1# Cream	3.26	3.37	3.83	3.86	3.83	3.17	3.02	3.21	3.83	3.83	3.46	3.21	2.25-5.95	3.30	3.13	3.02
1# Comb	4.10	3.76	5.13	3.73	5.13	4.60	3.82	3.67	5.13	5.13	6.90	3.99	2.50-8.75	4.14	4.19	3.65
Round Plastic	3.76	3.49	4.64	3.25	4.64	4.00	3.13	3.76	4.64	4.64	6.00	4.58	2.60-7.50	3.81	3.86	3.31
Wax (Light)	2.66	3.01	2.00	1.89	1.70	2.98	2.13	2.83	3.55	3.55	2.62	3.13	1.00-7.00	2.66	3.04	2.29
Wax (Dark)	2.45	3.01	1.75	1.74	1.50	2.59	2.04	2.38	3.48	3.48	2.33	2.66	1.00-7.00	2.44	2.62	1.97
Poll. Fee/Col.	34.79	35.50	29.00	32.64	36.86	34.20	36.67	37.67	36.86	36.86	45.00	32.00	25.00-50.00	35.58	34.03	33.79

? DO YOU KNOW ?

Reproductive Biology

Clarence Collison

Understanding the reproductive biology of a honey bee colony is essential to successful colony management. Two different types of individuals make up the reproductive castes of the colony. In addition to the role of the queen and drones, swarming and queen supersedure are part of the reproductive biology as well. Management practices must be aimed toward fully utilizing the reproductive capacity of the colony.

Take a few minutes and answer the following questions to find out how well you understand these topics.

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

1. ___ Swarming and supersedure are somewhat similar processes as in each the old queen of the colony is normally replaced by a new one.
2. ___ Worker honey bees frequently destroy unfertilized eggs and drone larvae if rearing conditions are not optimal.
3. ___ Removing or destroying drone brood in colonies encourages its production.
4. ___ Swarming in honey bee colonies normally occurs in mid-Spring and again in late Summer/ early Fall.
5. ___ Drones start taking orientation flights prior to becoming sexually mature.
6. ___ Drones normally leave the colony in the afternoon to search for congregation areas and make several flights per day.
7. ___ While away from the hive, drones replenish their energy supply by visiting flowers.
8. ___ Swarming is a form of reproduction at the colony level.
9. ___ Scout bees leaving a swarm cluster seeking a new or reconfirming the suitability of a home site, use the round dance on the surface of the swarm to tell other scouts about its location.

Multiple Choice Questions (1 point each).

10. ___ Which of the following characteristics would you use to best judge the quality of the queen?
    A. Amount and pattern of brood
    B. Size
    C. Color
    D. Nervousness on the comb when the colony is open
    E. Temperament of the colony
11. ___ The rearing of drones in a honey bee colony normally peaks ___ weeks prior to swarming.
    A. three
    B. two
    C. four
    D. one
    E. five
12. Drones are produced in cells that measure approximately ___ cells per linear inch.
    A. six
    B. two
    C. three
    D. four
    E. five
13. If a virgin queen is prevented from going on her mating flight, she will lose the urge to mate in approximately ____ week(s).
    A. three
    B. five
    C. two
    D. four
    E. one
14. What is the primary function of the drone in the honey bee colony? (1 point).
15. The destruction of queen cells by the beekeeper prior to swarming has what impact on the issue of swarms? (1 point).
16. In what two ways do afterswarms differ from primary swarms? (2 points).
17. It is usually possible to differentiate between supersedure and swarming, but the criteria used in diagnosis overlap. Explain how you would determine if a colony is preparing to supersede its old queen or making preparations to swarm. (6 points).
18. Queen honey bees have two major functions in the honey bee colony; please list them. (2 points).

ANSWERS ON PAGE 47

Guest Editorial

Another Perspective Of The Honey Industry

Jim Robertson

My name is Jim Robertson and I have been a commercial beekeeper with 1,000 hives or more for 35 years, and have had bees for 45 years, having caught a swarm when I was 13 years old. I currently run about 3,000 hives. My brother is also in the bee business running about 1,700 colonies.

Every year during the almond bloom in California we hear stories of beekeepers cutting the price in order to place their bees in the almonds. Currently the pollination price for almonds is around $40.00 per colony. But there are these people that feel the only way they can rent their bees is to cut the price.

This last year the reported price was from $28.00 to $35.00 per colony. I presume these beekeepers know what their time and their bees are worth, and so they are probably charging too much, but I always wonder if maybe they didn't forget to figure in all their expenses.

The words in a country song go, "It don't matter where you played before California is a brand new game," and believe me it couldn't be more true. It seems there are a number of things that will occur if you are a migratory beekeeper and stay at it long enough. This year in California was a good example. You could have had your bees washed down river in the flood, then six weeks later had them burned up in a fire in the same beeyard. If you haul bees interstate, sooner or later your going to lose a load of bees to truck wreck. The State of California will at some point want a piece of you, as in the past tracheal mite quarantine. Last year two loads were eradicated for fire ants. What will it be next year?

What I am getting at is that these are all expenses and need to be figured in and added to the column referred to as expenses. It is a good idea to also include your wages and return on equipment (bees). When all the expenses are added up and deducted from the income side, theoretically there is supposed to be something left over called profit. If there isn't you're working for the fun of it, but I guess that's the bee business. I never figured out what I enjoyed more in the bee business, the freedom of being your own boss, or the thrill of being broke. This is not a lucrative business, so let's try to keep the price up and not cut prices.

In the almonds, when a contract is lost to a price cutter, if you stick it out and wait and let it be known you have some bees loose, providing you don't have a bad reputation (price cutter, thief, etc.) they all seem to get rented by bloom time at your price. The price cutter ends up getting less for his.

With melon pollination we were getting $22.00 per colony 10 years ago. Then some smart guy figured it out and decided he needed more pollination so he came in at $17.00 the first year. We met his price to keep the contract. Next year he came in at $12.00, we said take it. Now my question is, which makes more money, one rental at $22.00 or doing like the smart guy is doing two rentals, and some three rentals at $12.00.

If your answer is $24.00 or the $36.00 deal on two or three rentals you obviously don't understand the ins and outs of melon pollination. Two and three sets are rough on bees, they don't make much honey and Winter losses are higher. One set pays better – they make more honey, with lower Winter losses. You don't lose a $40.00 almond pollination for a $12.00 melon pollination. One or two other beekeepers would also get to do some melon pollination and increase their income. The difference in cost to the grower, at half to one colony per acre, is $5.00 to $10.00 per acre higher. This is about the cost of packing two to three crates of melons (depending on the quality of your bees and the ability of the grower, the field will yield 300 - 700 crates per acre). What it boils down to is that when you cut price you cut your own throat.

Which brings us around to the honey aspects.

In my opinion The Anti-Dumping Action was the best investment a beekeeper could have made in his business. The continuation and enforcement of it continues to be the best possible return on our money. Thanks to the untiring actions of Don Schmit, Richard Adee, and Troy Fore doing their best it became a reality, but realistically the anti-dumping action was a moment in time. It happened at the right place, right time, right action. Later it would not have flown. By itself it would have raised the price of honey to the 62-65 cent range, but fueled by what appears now to have been a very short term world honey shortage, a psychological market took off, and coupled with a honey buyers' greed and the desire that each one of the packers has to sell all the honey in the world.

As the price rose beekeepers started holding honey for higher prices which fueled the shortage and for once good marketing was paying off. But being greedy sons of guns – we shot ourselves in the foot, got the price high enough where honey was not a good deal and consumption slipped. At 47 cents honey was the best sweetener buy on the market (like selling warm coats on a cold day). Interesting enough even with honey being such a good deal we still didn't run over the 300 million pound mark. This has been the average for last how many years? I don't have all the neat information that the big people get; I just know what I read in the newspapers and learn from talking to beekeepers and honey packers and it appears that honey sales slipped to about the 275 million lb. mark last year, with 160 million lbs. imported. Prospects for 1997 don't look real bright with a fairly large beekeeper holdover into 1997,

and the high packer inventory going into 1997 coupled with high imports from Argentina at lower prices – in the 68-75 cent range.

If we just have an average crop of 200 million lbs. we could end up with a 100 million or more surplus by Fall of 1997. Be kind of like the old days when you couldn't give honey away.

Which brings us to the question about the Honey Board. They wanted to take credit for this big jump in honey price. Will they want credit for this current drop in honey price and slow down in sales? Personally, I have always had serious questions as to the value of the National Honey Board. I personally can't see where they have helped my honey sales. I have had to pay into it about $20,000.00 in the last 10 years. I am sure my wife and kids could have figured out a place to spend it with more benefit. I was quite impressed with Dan Hall, when it first started, but he was fired, and it seems I was good enough to pay assessment to keep the Honey Board going but I was never good enough to be told why he was fired! If I am paying the bills I want to know what is going on and why!

The current idea is to raise the assessment another penny and increase packer representation. Instead of the current $6.30 a barrel of honey if passed, you will be paying $12.60 per barrel (multiply by number of barrels produced each year and you will have your honey tax bill). Increasing the packer representation on the board will be turning the honey board over to the packers which may be where it is now already. We are promoting the sale of CHEAP FOREIGN HONEY.

The packers, in case any of you have not given it any thought, (with the exception of a few who support the U.S. bee business, but have to compete with the other packers at questionable values) would just as soon see the price of honey lower. They operate on a spread where it does not really matter what the cost of production is, but there is a larger volume with lower price. As we go through these price changes remember the packers who stayed with you and supported the industry. Give them a break if you can and DON'T FORGET THE ONES WHO STUCK IT TO YOU!

The other area where the plan is to spend our money is for research. Now really! The ARS already has a 4.5 million dollar budget for bee research. I am old fashioned and ignorant enough to still believe that 4.5 million dollars is a lot of money. Also there is an additional million for African bees, yet they say they have only $15,000 per researcher for research. Sounds to me like time for some house-cleaning, not additional research money to be blown.

Question. What was the last research done that actually made you some money? Now don't say Apistan, because that came from Europe and I would hope that part of that $1.50 we spend per strip (cost of production, maybe five cents) doesn't all go to profit, that Sandoz does spend some for product research. Everything I do in my outfit I learned from another beekeeper. Having had a Scottish grandfather, I like to get a dollar value for a dollar spent, I don't see where this has been happening.

I was once told that 30% of the beer drinkers drink 80% of the beer, I am inclined to believe this. I have known people who drink four beers before breakfast. I drink about four beers a year but I do eat lots of honey. The reason I eat it is because I believe it is good for me as well as I like it. It has been my observation that most real honey eaters, (30-60 lbs.) a year are health food enthusiasts. I would be giving away D.C. Jarvis's "Vermont Folk Medicine" book instead of cook books if I was to try and promote honey. He has been our best honey salesman and hasn't cost us a dime. Jarvis encourages the use of raw unfiltered honey, a teaspoon every morning with natural unfiltered apple cider vinegar.

The most effective honey promotion they could do, if packers rwally cared about their business and could agree on anything other than to collect money to promote honey sales from beekeepers, would be to subsidize the potion pack part of the industry, to enable nothing but the finest honey available to be packed in these individual serving containers, like our California sage, orange, some of Oliver Hill's fine star thistle, or Montana clover. You get the idea. So that after a person eats some honey in a restaurant, they should say "that's good" and stop on the way home to buy some honey. As a beekeeper I am sure you have all experienced talking with the people you give local honey to and have heard them tell you many times how good your honey is, not at all like they get at a store. Packers, this is your fault, some of you forget to pack quality.

On this last Honey Board referendum my brother said after reading the different articles, we must be the only ones voting against it. Since then I have talked to a lot of people who have said they voted against it, too. Somehow the numbers have not been coming out right. Maybe most of the people I know are a bunch of red necks, but I would like to check into it. If you voted against the Honey Board referendum send me a card or email message with your name and pounds to: Jim Robertson, 14700 N. Hudson Ave., Dos Palos, CA 93620-9420, Ph. (209) 392-2441, FAX (209) 392-3617, E-mail: Riker17@inreach.com BC

1897-1899

1897 was the Silver Anniversary of *Gleanings,* having survived its first 25 years – subscriptions were still $1.00/year, $1.80/2 years, $2.50/3 years, and $3.75/5 years.

The year starts off with a bang when A.J. Cook, Harrison, N.E. France, Larrabee, Doolittle and Demaree all wanted *Apis dorsata* imported into the U.S. E.R. seems to think it wouldn't hurt and it should be tried.

R.C. Aiken, from Colorado starts a new column entitled 'Ridge Pole Musings.' His first contribution is an extensive article on the culture of alfalfa out west, and its value as a honey plant. A well done piece.

A.I. is on the road again and writes of visiting Beetown, Texas, where he reports on hives with no bottom boards just sitting on the sand. From there he's on to Arizona with his brother Jess, on their 'wheels' (bicycles), of course, and they visit Superstition Mountain.

The Rambler's story about 'Beekeeper Fred Andersen' continues into the new year and early on wax was being bought at 24¢ or 26¢ in trade.

Sections (wooden comb honey boxes) were again under scrutiny, with heated discussions on size, shape, no-bee-way or bee-way, cleaning, grading, weights, marketing and the like. Management to produce good sections using large vs. Small hives and northern areas vs. Southern areas also come up.

The Root Company added a staple to their end bars that year, right under the ear of the top bar. This was to give perfect spacing to the frame. The end bar was shortened to accommodate this. They also discontinued listing Quinby smokers that year, but started showing the Danzenbaker reversible bottom board – essentially what we use today, with a 7/8" deep recess on one side and 3/8" recess on the other. The pieces were held together with a grooved cleat on each side. They mailed 100,000 catalogs that Spring showing all of these changes.

The Weed foundation machine had been improved to the point where it was automatically cutting foundation sheets to length, placing a sheet of tissue paper between them and making piles ready to box. A long essay on why this was superior to anything anybody else had appeared, written by E.R.

In May the Root Company had 230 colonies, A.I. visited the Cliff Dwellings in Arizona then on to the mines in Colorado and they were making 100,000 sections every 24 hours. But do beekeepers really want paper between foundation sheets? It helps to keep them from sticking together says E.R., but what do customers want?

Later that Spring N.E. France is named Wisconsin's first inspector and R.C. Aiken expounds, in depth, on marketing techniques for selling retail around home. At the same time there is a detailed description of an earthquake in California and the Root Company gives a barrel of potatoes (yes, a whole barrel), to every new or renewing subscriber. They gave away 500 in two weeks.

Because of all the 'wheeling' A.I. and E.R. write about, two bicycle companies are advertising in the journal, and the Root Company is selling bicycle tires.

Calls for standard retail containers are beginning to be heard, and some packers are saying honey should only be packed by 'experienced' operations so grades can be standardized. Hmmm.

E.R. recounts an experience of 'herding' a swarm to a spot he wants, using a sprayer with water. By mid-June they had shipped 50 carloads of equipment to their dealers, and N.E. France wrote to say that 'diseases are found where no Bee-papers are received.' See, there's another good reason to subscribe.

In August the Root Company bought a new, larger press and put new headers on everybody's columns, changes the type style to a more formal but space-saving format (increasing the copy per issue by about 9%). A.I., however, keeps his articles in his same small, tight format. His sister, by the way, was the target of a pick-pocket while on excursion in Elyria, Ohio, which produced a wealth of material for his columns on the good, (and bad) of man.

The entire company was treated to a picnic at Lake Erie that season, as a reward for an incredibly productive season. Seven coach cars and one baggage car were enlisted to take the 400-500 people on holiday (180 employees plus their families). Part of that season included the 800,000 new Hoffman frames they made that year, all with staple spacers.

In November they offered eight pages of premiums for new or resubscribers including books, purses, baseballs, hot water bottles, traps, skates, carpet sweepers, meat grinders and silverware.

At the end of the year the Root Company formerly introduced the no-bee-way section and reusable fences in their catalog (used 16 years ago by G.B. Lewis, they never caught on, until E.R. started writing about how good they were). They were better filled by the bees, had fewer passage holes, were more solidly held in the section and easier to clean.

At the end of the year A.I. had a long discourse on how to be more reliable at work, and why you should be, the company would need 50-60 tons of wax for the next year, and top-bar wedges were first introduced to fasten foundation sheets.

1898 was a mixed-blessing year for the Root Company. Business boomed, and boomed and boomed. By April they were running a month late on wood orders, and by June they had 250 employees and were still behind. They were producing 5-600 hives, 90,000 sections, 1000 pounds of foundation *a day,* running 1000 orders every 10 days, and producing three million sections a month.

E.R. gave the following stats: Between July 97 and July 98 they had produced 20 million sections, 55 tons of foundation, a half million fences, 3000 Danzenbaker hives, 3000 dovetailed chaff hives, 7000 dovetailed 10-frame and 50,000 dovetailed eight-frame hives. Plus all

the other appropriate beekeeping equipment they made.

The down side was that they had orders for a third again as much equipment and couldn't keep up. They disappointed a lot of customers that year in both late, or unfilled orders. Advancements needed to be made!

Meanwhile, new headers were again added to each column, Ridgepole says to use a scale hive and, somehow, bees were communicating inside the hive. A.I.'s daughter married Arthur Boyden (Calvert's assistant), and A.I. visited Bermuda, and its onion producing fields.

E.R. visited, that season, what must have been nearly heaven for a beekeeper. A New York beekeeper had a 5-600 colony apiary (really!), that had, within three miles, 5000 acres of buckwheat. Those colonies were making 100 pounds of honey a day. I did say nearly heaven.

In May Charles Muth dies of his own hand. His estate was in extreme debt and there was trouble yet to discover. Doolittle was still one of the most prolific writers around, and in June produced one of the best articles on how to find the queen in a populous colony I've read. I could publish it today.

The credit for the queen excluder (then called a honey board) is given to F.A. Hannemann, a German living in Brazil. He invented it to use as a sieve to strain out drones and the queen when hiving a swarm.

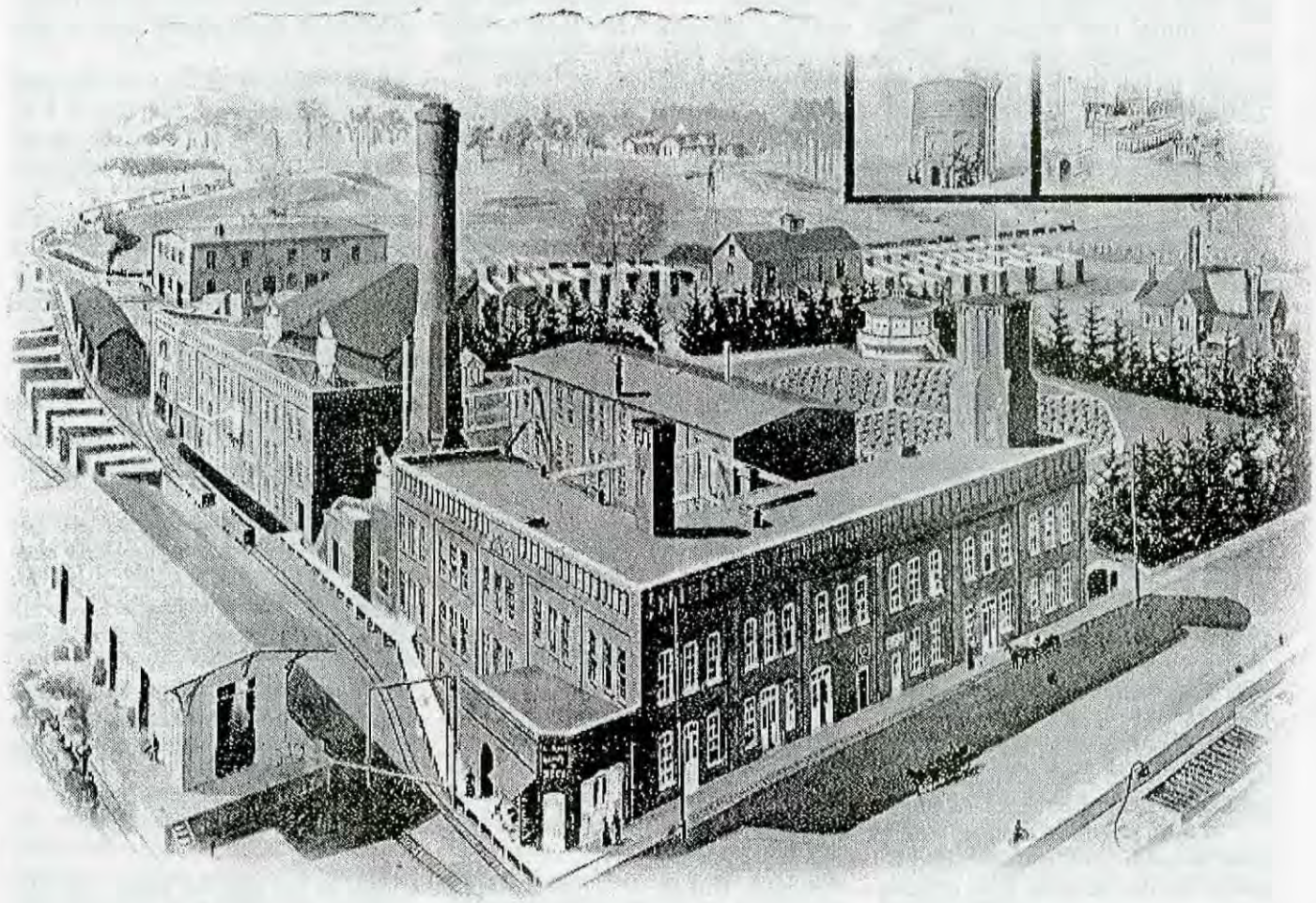
Do bees prefer to attack 'black' as opposed to lighter colors? Hats, spots on clothes, hair, etc. were discussed, and A.I. went to Yellowstone, and teased a bear in a tree. Not too good of an idea, I think, but he enjoyed the experience.

There were more and more photos used each month illustrating apiaries, equipment, sections and people. C.P. Dadant started an extensive series of articles on the use of large, vs. small hives (it ran for several issues), and the Muth estate was declared unsolvent.

In October the entire factory shut down for six weeks to install new equipment, and a much larger engine to run the enlarged factory. The entire factory was wired so all machines would run on electricity, an annex was added to the woodshop, new dynamos were installed, new saws, planers and section equipment were added. Next year they wouldn't be caught short, they said.

Cheap foreign honey from Cuba was discussed (not very rationally, unfortunately), Root started making extractors with ball bearings on the main shaft, Medina voted to stay dry (the temperance people, led by A.I. and the local ministers won a close vote) and if you voted not to stay dry, and worked for the Root Company, well . . . there was trouble in *your* future, don't you know.

In November there was a fire in the factory, but because of the advanced sprinkler system, plus the ready abundance of water and hoses it was put out before E.R. could even get dressed. It turns out the Root Company's fire fighting system was more sophisticated



The Home of The Honey Bees in 1899

Continued on Next Page

"The two things beekeepers worry about most – How to get a crop of honey, and how to get rid of it."

C.C. Miller, 1898

than the city of Medina's. No fires in this factory (and none to date, either).

C.C. Miller made a great comment that Fall: "The two things beekeepers worry about most – How to get a crop of honey, and how to get rid of it." Once again, some things never change.

In December that year there was a 10-page symposium on the pros and cons of the no-bee-way sections, and a very candid photo of C.C. Miller at home, working at his desk with magazines, papers and whatnot strewn about his chair on the floor. Not, I might add, unlike this Editor's working conditions.

The 1899 Edition of *ABC* was released at the end of the year, 120,000 catalogs were printed, Root was selling extracted honey in 60 pound cans, two/case @ 10¢/pound, and the new factory and electric additions were shown in a fine series of photos. Finally, A.I.'s daughter, Blue Eyes, has a son, named Ernest Boyden.

Doolittle had broken ribs, Root had 252 colonies and the magazine had over 300 people who had subscribed for all 25 years in January, 1899. Medina had 2,500 souls, A.I. went to South Dakota and Cowan's (Editor of British Bee Journal) children were drowned in a sea disaster. Skylark, (a past *Gleanings* writer) died in January, too.

A.I. wrote about heating his house with excess steam from the factory which by the way made 26 carloads of equipment in only six weeks after the factory reopened. The Danzenbaker hive was out, and wedge top frames were in, along with hand holds on supers that year.

What is travel stain? Does it go all the way through the wax? To be discussed to death all year and not decided.

That honey leaflet put out a couple of years ago by the Company written by Miller, wasn't doing much for selling honey. E.R. thought maybe it was printed to cheap. Super Springs for section supers showed up early in the year (borrowed from a California beekeeper), a 400HP boiler replaced the three 60HP boilers in the factory, the cover of the magazine was coming out in different colors with different color ink (Finally!), and by May 1, they had shipped 77 carloads of equipment. They shipped only 52 in all of '98.

Although missionaries had tried, and failed to hive *Apis dorsata* in the Philippines, the Root Company was selling them for 10¢/each in alcohol.

Several new hive tools showed up that year – sharpened screwdrivers, rounded-end scrapers, a framelifter end, a top bar scraper, even a flared end scraper. But all of these combined weren't the one we have today. Still waiting.

That Summer E.R. offered $100 for a superior queen. One that E.R. wouldn't sell for a penny less than $100. And, once sent in, E.R. wanted a season to test the queen himself. Purpose – start a breeding program. If the queen turned out as good as that, he'd sell daughters for $25.00 each. No hybrids though. Don't know what they'll throw. *Pure ladies only.*

A lot of discussion on selling honey took place that year. Commission men accused all beekeepers of being crooks because not one put an 'average' section on the outside (visible side) of a case. Good on the 'show' side, bad on the inside.

Meanwhile, E.R. warned beekeepers on how to avoid being taken by commission men and buyers. His suggestion was to send your honey to the shipping place in your name, send the bill of lading to the local bank and have *them* collect the money. Or, have the freight company express the bill of lading to their agent on the other end and do the same. Also, send in *good* shipping cases (Root happens to sell them).

Late that Summer, a bunch of tourists were stranded at the depot near the factory. They had been drinking and started messing with the factory equipment. There was an accident and one tourist was killed. But that didn't stop them. Finally, a watchman drove them off with his revolver. A.I. recounting this, defended the use of the gun, and how much trouble drink, and free time could raise. So there.

Selling honey? Make your container consumer-friendly. Too big, too hard to get the cover off, too heavy, too hard to pour? All of these make honey hard to sell. Get a clue, here.

A short honey supply toward the end of the year should have brought honey prices up, but didn't. E.R. advised holding onto your crop because a shortage would, eventually, bring prices up. Good marketing schemes, it seems, run through history.

The Rambler, out in California, has built a portable honey house. Shaped in an octagon it fastens together with bolts. He was married but no mention of his wife. I don't think I missed an article, but no mention of the Mrs. was made.

A purple loosestrife sample was sent to the Root Company from Nebraska in 1899, much ahead of recorded records, I think.

A.I. ends the century with a long discussion on the cost of fireworks, laws regarding selling tickets to events, and his trip to the state fair.

But E.R. finishes with a most unkind note. Neither he, nor any of those who work the Root Company bees like the grape vines A.I. planted over their hives for shade. They get in the way, are a nuisance to walk around, and are a mess to clean up every Fall. Some things do change, I guess.

I assume A.I. never read those comments. Those grapevines were almost as important as the bees in those early days. How times change, even in the best of families.

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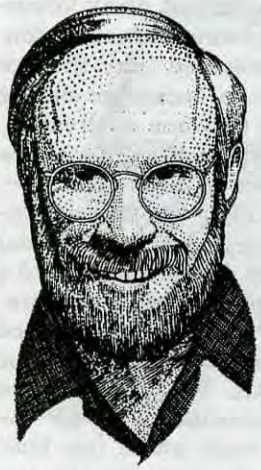
We'll start with 1900 in the October issue. The 20th century is as interesting as the 19th. Only it isn't quite so long ago.



Mark Winston

Burden Of *Proof*

"Scientists require repeatibility, controlled experiments and statistical analysis in order to accept a result."

A student asked me the other day where the ideas for these columns come from. It's coincidence, and juxtaposition. Take this month's column, for example. I just finished reading one of the innumerable John Grisham lawyer books, in which there were courtroom scenes galore that had eloquent lawyers attempting to convince the jury of their respective client's guilt or innocence. Then I happened to pick up a new issue of *Bee Culture* and read the letters to the editor. One letter struck me in particular. It was from an individual who sells a new, but scientifically untested "cure" for mites. His letter was objecting vehemently to an article by a state apiarist that suggested there was little proof for the efficacy of his product, and warned beekeepers to beware of this and similar untested miticides. And then, a dim spark went off in some corner of my brain where connections get made, and I thought "Burden of Proof."

That is, how do we scientists "prove" something? This is an area of serious misunderstanding between beekeepers and bee scientists, since the two cultures can have very different criteria for what is fact and what is conjecture. Beekeepers are raconteurs, extraordinary storytellers, and tend to the anecdotal. Scientists tremble at the thought of believing an unproved statement, and require repeatability, controlled experiments, and statistical analysis in order to accept a result. A typical scene at a beekeeping meeting is a scientist presenting overwhelming reams of mind-numbing data slides during a talk to conclusively demonstrate a point, followed by a beekeeper asking a question that begins something like "Last Summer, I had this hive I got from my uncle so-and-so who lives up in the hills out beyond somewhere. He's been beekeeping for 50 years, and he said . . ." The beekeeper tells a story about a particular hive that contradicts the years of data the scientist had painstakingly accumulated, and of course, most everyone in the room trusts the anecdote more than the data.

Anecdotal stories may be considerably more interesting than a series of facts and data, but anecdotes don't tell us much except whether the storyteller is a good speaker. They may, however, be the beginning of an idea that leads to more rigorous testing, and eventually to a proven hypothesis.

Let's take the example of a new mite control, which I'll call "Mite Destroyer." Pretend for a minute that a beekeeper accidentally spilled a bottle of Coca-Cola onto the frames of a hive one Spring. He got a bit busy for the rest of the season, and didn't return to the apiary until the end of the Summer. Then, he found every colony in the apiary dead or dying from mites, except for this one colony. He scratched his bee hat for a few minutes trying to figure it out, then suddenly remembered that he had spilled a Coke in the hive. Dollar signs immediately sprang unbidden from the depth of his beekeeper brain, and by the next season, he was marketing a product called "Mite Destroyer," with the secret ingredient of Coca-Cola, and with a marketing strategy based on telling the tale of how every colony in the apiary died except for the one in which he used his miracle mite cure. He would not, of course, reveal the identity of his secret ingredient, or else every beekeeper in the country would be buying out the Coke supplies at their local grocery stores instead of his product.

Now let's pretend that our beekeeper, a *bee scientist* who also loved to drink Coke, spilled some cola into a hive one Spring, and returned at the end of the Summer to discover a dead apiary, except for this one colony. She, too, remembered spilling the Coke, but her approach to the problem would be very different from that of the beekeeper.

The next season, our bee scientist would conduct a preliminary experiment to test the hypothesis that Coca-Cola could kill mites. She would construct in her mind a null hypothesis saying the opposite, that "Coca-Cola does not kill mites," and then set about to disprove her hypothesis by collecting data that would falsify or negate that statement. Her first experiment would be a simple one, perhaps treating 10 colonies with Coke and 10 with a control, such as water poured on the hive. At the end of the season, she would count the numbers of colonies still surviving, or perhaps count the numbers of tracheal and *Varroa* mites in each colony, and then do statistical analyses to determine if the treatments were different. If, indeed, the results are different, her next step would be to write a three to five year grant to investigate whether these preliminary results would hold up under the rigor of a concentrated program of similar scientific testing.

But hold on! The chances of her

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"Anecdotal stories may be considerably more interesting than a series of facts and data, but anecdotes don't tell us much except whether the storyteller is a good speaker. They may, however, be the beginning of an idea that leads to more rigorous testing, and eventually to a proven hypothesis."

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first experiment providing clear and meaningful results are slim, because she would have to have guessed correctly about a number of aspects of her experiment. For example, the dosage of Coke might be important. One Coca-Cola applied once to the hive might have no effect. It might take two applied once, or three applied once a week for three weeks, to kill enough mites to show a statistical difference. Or perhaps her colonies were set up in such a way that the 10 that survived received more sunlight, and it was the combination of Coke and warmer temperatures that saved her treated hives, and Coke alone was not effective. Another possibility is her memory was not as good as she thought, and perhaps she had imbibed Pepsi Cola that day, and there was an ingredient in Pepsi that killed mites, but Coke was ineffective.

Let's give our bee scientist the benefit of the doubt, however, and assume she was lucky that first year and did get clear results showing that eight of the Coca-Cola-treated hives survived that season, only two of the untreated colonies lived, and her grant application was successful. The work she would need to conduct over the next few years would be designed to repeat the original result in well-replicated experiments at a number of locations, using at least 10 colonies for every treatment she wanted to test. She would test different dosages, application methods, and timings of Coke applications to definitively demonstrate that Coke contained a potential mite-controlling chemical. If these results continued to be positive, she likely would begin working with a chemist to determine the active ingredient in Coke that killed mites, synthesize it, and then repeat the experiments using only the active substances.

Again, let's be generous and assume the three years of testing were successful, and she had proven to the satisfaction of her fellow scientists that Coke killed mites. Would it be ready for the marketplace? Not yet, because she would still have to prove to the government that Coke did not leave harmful residues in honey or wax, and to beekeepers that it was cost-effective. Another round of tests would be necessary, this time sampling Coke-treated colonies at regular intervals to determine if any remained in the colony after treatment, especially in the harvested honey. Also, suppose Coke killed mites and colonies survived, but their honey production was reduced and beekeepers couldn't make money from Coke-treated hives. Yet another round of commercial testing would be necessary to prove that Coke was not detrimental to bees and to commercial beekeeping.

Finally, perhaps five to seven years after the first Coke spill, the product is ready to patent. Patenting is important, because beekeeping is a relatively minor enterprise to the world of commerce, and a miticide is not worth testing, licensing, and selling unless a company has clear and unique rights to market it. Now the lawyers come into the picture, and a few more years can be wasted until the patent is approved by the government and the scientist concludes an agreement with a company to market the product. In the case of Coke, of course, a company already exists that markets it, but it would have to be specifically formulated for killing mites and patented and marketed as such, in contrast to the soft drink formulation sold for human consumption.

I have presented here the two extremes, one, a beekeeper basing a business on only one observation, the other, a scientist testing a new product for five to seven years before it shows up on the market. Unfortunately, these extremes are not far from reality. I recently received a phone call from a company that supplies a type of hive that is advertised in the bee journals today, asking me to try one out. When I inquired about the scientific basis for the claims being made about this hive, I discovered the data for the improved honey production claimed for this design were based on one colony compared to one traditional Langstroth-type colony. In contrast, I myself have worked on projects such as identifying and commercializing honey bee pheromones for use as attractants in crop pollination, and saw almost 10 years go by from the initial idea to the point where there was a reasonable level of sales for the product.

If I had to choose, I still would choose the burden of proof over the anecdote. The role of science in beekeeping should be to provide rigorous analysis and clear proof before products come to market. As beekeepers, we should demand to see proof from properly conducted tests before buying a product that may or may not work, or even if it does work, might harm our bees or our customers. Beekeepers often become impatient with the slow speed at which scientists work and the hesitancy with which we endorse new products. Yet, it is that caution that provides some protection from overly optimistic claims of product performance, and the independence to pursue unbiased analysis that provides the most reliable verification of new ideas. Sure, it's fun to listen to anecdotes, but good research *starts* with an observation or a story, rather than ending there. BC

Mark Winston is a professor and researcher at Simon Fraser Univ., Burnaby, B.C. Canada.

For an excellent two-part article on the scientific method of studying mite control, see the June and July, 1996 issues – *Do Your Own Research*, by Buzz Phillips. These articles appear in the Archive section of our Web page at www.airoot.com. – Ed.

Roger Morse

Research Review

"Communications & Relations"

Successful foraging honey bees return to the hive and "dance" on the comb surface, thus indicating to other bees the direction and distance of the food they have found. We can look at a dancing bee and understand the message she is giving. But how recruited bees understand what is taking place has never been clearly explained. I like the data from a new approach.

I reported in this column last December on a paper that found, using high-speed video, that the wag-tail portion of the dance involved one long stride. During the wag-tail part, even though the action appears quite violent, the dancing bee has four, five, or all six of her legs holding onto the comb in a rigid manner at any one time. It was suggested that in this way, the vibrations could be transmitted to the comb.

A more recent paper states that vibration of the rims of open cells is transmitted across the comb. It is suggested that dancing bees cause the comb to vibrate and bees being recruited may pick up the vibrations with organs on their legs. This is not a suggestion out of the blue but has some background that makes it a seemingly logical conclusion.

It has been known since the early 60s that there is a sound associated with the dance. This was discovered independently by Drs. Harold Esch, now at Notre Dame, and Adrian Wenner, who is retired from the Univ. of CA system. Since honey bees do not have hearing organs for the type of sound we hear from the dance, the Esch-Wenner discovery did not tell us how the system worked; however, it is frequently mentioned when people are raising questions about the dance language. It is now thought the sound is a result of vibrations produced by dancing bees.

In the paper I list below, a high-speed video reveals it is not just the abdomen, but the entire body of the bee that is thrown first one way and then another during the dance. "The motion resembles someone sitting in a boat and rocking it from side to side." The feet of the bees following the dance are also "placed firmly on the rims of the cell walls," but still close to the dancing bee. It was also observed that dances on open cells recruited three times more bees than did dances on capped brood. Presumably, the cappings dull the vibrations.

These researchers took the matter a step further and have examined the legs of worker bees for organs that might receive the signals. It has been known for some time that other insects are sensitive to vibrations and that there are organs on the legs of worker bees that have no known function.

The vibrations on the comb surface were studied by placing a probe against the wall of a cell and driving it with an electromagnetic vibrator. The leg of a bee was pinned to a block in such a manner that the claws were attached to comb several cells away from the source of vibrations. "Displacement of the rim of a cell can be recorded up to 30 cells away." It was found there are differences in pieces of comb in wooden frames and those that were free.

The dance language of the honey bee has fascinated us for half a century. You and I cannot deny honey bees dance, but what the dance means to bees and how it all works has been a mystery. Today, there is a little more light on the subject.

Sandeman, D.C., J. Tautz & M. Lindauer. *Transmission of vibration across honeycombs & its detection by bee leg receptors.* Journ of Experimental Biology 199: 2585-2594. 1996.

Subspecies Identification

Traditionally, species and subspecies of honey bees have been identified by their morphology, that is, their external shape and form. Unfortunately, morphology can be misleading, as it can be affected by diet, temperature, cell size, and a host of other variables.

However, new techniques are coming into play that make it possible for researchers to be more specific. The new data show that the 24 races of honey bees native to Europe and Africa may be divided into four groups. Those within each group are more closely related to each other than they are to the other subspecies. The four groups are: the bees in Europe, the bees in the northern Mediterranean area, the bees in the eastern Mediterranean including the Caucasus, and those from Africa. (The honey bees we know were originally found in Europe and Africa only.)

This information is especially useful now, as we are looking for special attributes such as resistance to various diseases. Being able to identify the backgrounds of various subspecies should be helpful in looking for new material.

There is another, perhaps small point concerning whether we call different bees races or subspecies. I have always hesitated to use the word subspecies since I wasn't sure that closely related subspecies could be positively identified. It is now clear they can using these new DNA techniques, and that makes the use of the word subspecies valid insofar as I am concerned. BC

Arias, M.C. & W.S. Sheppard. *Molecular phylogenetics of honey bee subspecies inferred from mitochondrial DNA sequences.* Molecular Phylogenetics & Evolution 5: 557-566. 1996.

21st Century APICULTURE

A Review Of The East Lansing Symposium

Kim Flottum

A continuing goal of this magazine is to make the latest discoveries and innovations of the science of honey bees and beekeeping available to those who can most use them. But scientific articles, published in technical (and often obscure) journals can be difficult to find, and often impossible to interpret. And scientists are driven, and rewarded for these publications, not in making their discoveries useful or available – it is the system we must live with.

So, if the mountain won't come . . . then *Bee Culture* will go to the scientists. In late June, we attended a two-day symposium in East Lansing, MI, honoring the retirement of Roger Hoopingarner. Nineteen internationally known scientists each spent 30-45 minutes explaining their research projects, and how they applied to the future of honey bees, beekeeping and honey bee science.

We've taken the information from the most informative of these, sifted out the practical and applicable and present here the results. Take what you can use, enjoy the rest, and save it all – the 21st century isn't that far away.

Rob Page

Rob Page, UC Davis keynoted this section discussing his pollen hoarding selections, and the response threshold these bees have to exposure to sucrose. He looked at water and nectar collectors in colonies with high pollen hoarding behavior and measured colony responses to varying concentrations of sucrose.

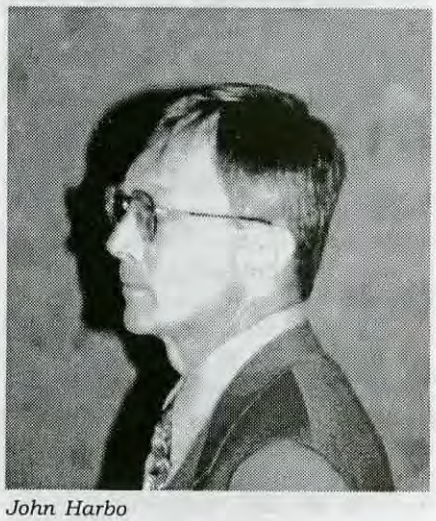
Page shows that producing bees that prefer collecting pollen over nectar is relatively easy. After only five generations the behavior was significantly higher than colonies selected for low pollen hoarding behavior, and much higher than commercially available colonies.

Incorporating this behavior in colonies used for pollination would be advantageous to growers and beekeepers.

John Harbo, USDA, Baton Rouge, studied colony level responses to some aspects of *Varroa* mite reproduction using single drone and multiple drone matings. He set up 24 colonies with 375 grams of bees and 90 mites. Twelve colonies were headed by single mated queens, 12 by six-drone mated queens. He looked at mite reproduction in each colony. His background data suggested there would be, in single drone colonies, more variability among colonies, but less within colonies. Further, Rothenbuhler's work showed that the expression of rare characteristics in multiple-mated drone colonies would be masked.

The results pointed out that single mated colonies had a higher percent of non-mite-reproduction when compared to multiple-mated colonies. However, queens from single mated colonies had shorter life spans – 80 percent were gone in three months, 95 percent by eight months. Thus, studies need to be short-term, and breeders selecting stock need to do so early in the game.

One interesting aspect of this work was the cage he developed to hold 75 pounds of bees. he built a large cage screened on three sides, then put a tunnel inside, running the length of the cage, opening outside. The tunnel, too, was screened for maximum ventilation. It kept 75 pounds of bees from suffocating.



John Harbo

Ernesto Guzman, from Santa Cruz, Mexico discussed his selection program in Mexico using only African honey bees. He started by measuring traits in the existing population including honey production, defensiveness, brood pattern and wing length. He selected queens from colonies with the highest production, least stings in a black flag, and longest forewing length. Essentially he was selecting for the European traits present in the population. Queens selected then produced daughters for drone producing colonies in the test area.

Results were dramatic. Compared to control colonies honey production increased 15 percent (controls dropped 50 percent), stings/minute went from 97 to 43, in the five years of the program stinging incidents went from 19 to 0, and forewing length went from 9.14 to 9.4 mm. Swarming went from 96 percent of the colonies swarming to only 27 percent.

His program was aimed at assisting beekeepers with little technology (Instrumental Insemination equipment) keep more productive and safe colonies.

Kirk Visscher, UC Riverside, discussed mechanisms individual bees use when house hunting previous to swarming. He watched bees dance, measuring the number of localities explored early in the process, (high) and the feedback these bees received. He marked bees on two locations (only two were available in the desert location he chose), that were identical in attractiveness.

Scouts visited one site, returned and recruited more scouts and so on, until most scouts were visiting one of the boxes.

As time passed, more and more dances were counted since more bees were visiting the site. A graph of scouts at each site showed, on the first day about the same number of visitors, but on the second one site increased scouts dramatically. On the second day the colony swarmed to the more positive site.

Individual bees were videotaped showing dancers dancing and waiting, dancing and waiting and dancing again, dancing intermittently or following a dancer and visiting a site. Strong positive feedback and attention ultimately led to the final decision. Interestingly, about 10 percent of the scouts visited both sites.

Orley Taylor, Univ. Kansas, documented the move of African bees into parts of Mexico, and why the African bees do so well in taking over an area.

The assumption was that African queens would mate with primarily European drones, since there were so many in the area. However, his studies showed that there was a significant development time difference in these two strains. Pure European queens took 296 hours, African drone x European queens took 289 hours, African queens x European drones took 288 hours, but African x African took 282 hours. This factor contributed to a gene flow barrier and assortave matings, favoring African genes in the population. Moreover, hybrids had fewer survivors and produced less honey.

In a related report, Gerald Loper, USDA Tucson, retired, noted that feral swarms in his area of study just north of Tucson had gone from about 165 in 1991 to about 30 this year, all due to mites. Further, the gene profile of the remaining feral colonies had gone from completely European to essentially all African in the same time frame. African bees may be dominant, but were struggling against the mites.

Nicolaus Koeniger, Oberursel, Germany spoke on the biology of Asian bee mites and their honey bee hosts. He looked at *Varroa underwoodi on Apis cerana, Varroa rindereri* (a new species) on *cerana, Euvarroa* on *Apis florea, Tropilaeps clarae* on *Apis dorsata,* and another new species, *Tropilaelaps koenigerum* that can kill a dorsata colony in a month.

All told, *Apis mellifera,* in lab experiments, can support 10 different mites. Some mites cannot reproduce as efficiently on *mellifera* as on other species, but can, and will, given the opportunity.

Koeniger's message was clear – we've not seen the last of the mites yet.

Norberto Milani, Udine, Italy, had the most sobering talk of the meeting when he discussed *Varroa* resistance to acaracides in Europe.

He prefaced his talk with a brief history of chemical use in Europe. Around 1980 Thymol, formic acid, lactic acid and oxalic acid were used. Delivery proved difficult. By the mid

Gerald Loper

80s cumophos, amitraz, flumethrin and fluvalinate were being used. An interesting note was that cumophos, six times more toxic than fluvalinate had to be applied at six times the rate of fluvalinate because of its activity in the hive.

After 70 days, five to 30 ppb cumophos, less than 5 ppb fluvalinate and 0 ppb flumethin were found in honey. In wax little (but some) fluvalinate was found, except in combs adjacent to the strip, where nearly eight times as much was found.

Amitraz, shown earlier to be unstable in a plastic strip in their tests, had 100 ppb in honey right after treatment, 10 ppb after five months, and eight ppb after six months.

In 1987 fluvalinate as a strip was first used in Italy, and by 1988

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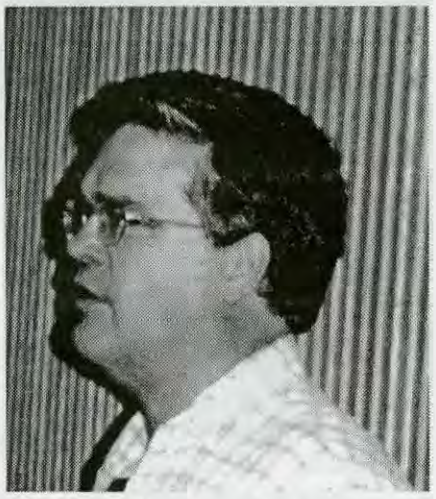


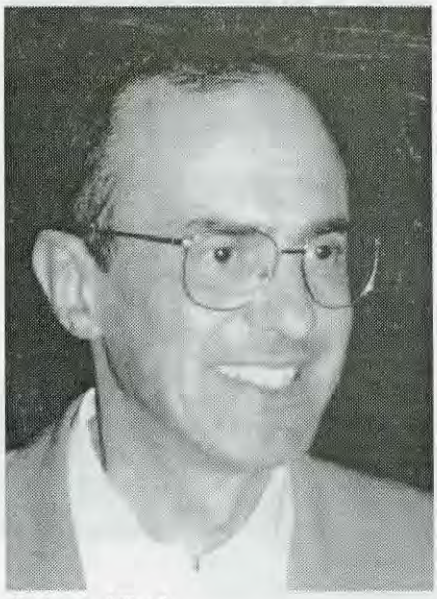
Kirk Visscher

Nicolaus Koeniger

its use was widespread throughout the country. In 1991 two small areas in northern Italy and one in Sicily were detected. A migratory operation between the two locations was identified. By 1996 all of Italy was populated with mites resistant to fluvalinate and the pattern was moving north into France, Switzerland, Austria and Germany. There were 70-80% losses reported that year.

By lab assays the pattern was obvious. In 1994, susceptible mites were killed when exposed to 15-20 ppm, and by 1994 they were handling 9,000 ppm.

He then outlined a program to combat resistance. But first detailed what had happened, exactly. By using a high dose of fluvalinate, killing 95 percent of the mites, only those homozygotes resistant to the chemical were left to reproduce. At normal reproductive rates this population needed only four years to become established. Rather, he suggested using a more moderate dose, killing only 80 percent of the mites. This would require a 10-year span before resistance developed. This did not, of course, take into consideration using alternate chemicals rotated with each other.



Norberto Milani

The implications for U.S. honey bees are obvious, we have been using fluvalinate for more than four years at the 95 percent rate. The clock is ticking.

The meeting concluded with a discussion by Marla Spivak, Univ. Minnesota, on *Varroa* mite tolerance in honey bees. She looked at mechanisms of tolerance – limiting mite survivability and reproduction. Survivability includes weak points at cell entry, reproduction in the cell, offspring leaving the cell and entering another and the number of reproductive cycles per female.

Another point was – are mite genetics changing? She quoted some sources as yes, there are differences, but others say no. And the success of *Varroa* on African bees was examined. In a cool environment infestations are fairly high, and gross colony mortality occurs. Add pollen and the reproductive rate of the mite increases, and add European cells and the mite load increases. None of these are significant in tropical areas.

What limits mite reproductive success? Multiple females in a cell, and perhaps previous cell infestations, too. Nutritional and hormonal levels of individual pupa may have a limiting effect, and of course the genotype of the bees themselves.

Grooming was mentioned. Auto grooming (bee doing its own) and allogrooming (bee on bee) are possible factors limiting mite success, which led to the topic of hygienic behavior. The best would be a nurse bee opening a cell and eating the paratized pupa. The adult mite may escape but its offspring would die. Grooming would lead to low survivorship, low numbers of offspring, but would have to be fairly aggressive to be a factor.

Marla Spivak

Spivak's work to date on hygienic behavior (or removal behavior as she now calls it), has led to a genotype that removes dead larva in 24 hours 72 percent of the time. This compares to 10 percent for her nonhygenic lines. Other traits that go along with dead brood removal include very low levels of chalkbrood, increased honey production and reduced *Varroa* populations.

She concluded with reviewing work done by Harbo and Hoopingarner on developing bees resistant to *Varroa* and found mite nonreproduction to be the most important limiting factor.

She concluded with the question she opened with – what defines tolerance? One year, two years, or forever without treatment?

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The information produced at this symposium was immense (there were 19 speakers and I did not review all of their talks). But what I came away with was that African bees can be managed (and how to do it), that colonies and individual bees can be manipulated to perform in various, productive ways and that the future of *Varroa* (and other mite) controls is in jeopardy, but if we can learn from past mistakes may be avoided.

The 21st century holds promise for beekeeping, and beekeepers with the assistance of good science, good scientists and, in my opinion, increased communication between these two groups. BC

Defining African Bees

There's no best way to ID an AHB, but they can be found

Gerald Loper

Since the range expansion of the Africanized honey bee (*Apis mellifera scutellata*) into Southern Arizona in the Spring of 1993, numerous swarms have been caught; some have been hived and located in an isolated apiary for research purposes. Before behavioral studies comparing European and Africanized colonies could be performed or interpreted, accurate genetic analyses had to be performed.

Initially, the USDA-ARS and the state of Arizona had decided to use a recently upgraded, but costly, method of morphometric (size) analysis which involves 21 measurements on each of 10 bees per sample (Rinderer et al. 1993). One of these measurements, forewing length ("FWLN"), is a critical measurement and was used as a preliminary "screen"; any sample of 10 bees with an average FWLN longer than 9.01 mm was assumed to be European and not subjected to the full analysis. When the full USDA-ID measurements are taken, the computer program results are probability statements that are based on sophisticated statistical analyses. By these analyses, a sample may be declared to be: European, European with evidence of African introgression, Africanized with evidence of European introgression, or Africanized.

The public is becoming familiar with the use of DNA evidence in criminal and paternity cases based on analysis of nuclear DNA. This DNA, derived from the nuclei of numerous cells, represents genetic material from both parents. These analyses are useful also when studying honey bees, but they are technically advanced and costly (and were not done on bees in this study). However, another source of DNA exists in all organisms: mitochondrial DNA inherited only from the mother. This DNA can be extracted easily from small orgnaelles in every cell, the mitochondria. This is referred to as mtDNA and can unequivocally determine if the maternal line (grandmother, great-grandmother, etc.) has ever included an African queen.

Yet another useful genetic analysis can be accomplished by using electrophoresis on crude extracts of proteins (enzymes) obtained from either the thoraxes or heads of individual bees. Specifically, two different enzymes, malate dehydrogenase (MDH) and hexokinase (HK) (each with two or more slightly different forms, or allozymes), are used to help characterize the genetics of honey bees. Africanized bees have high levels of MDH-1 (the electrophoretically "fastest" of three allozymes) and of HK-2 (the slower of two HK allozymes during electrophoresis). Thus, any sample of bees (we analyze 24 bees per sample) with high frequencies (>0.70) of MDH-1 and *any* HK-2 indicates some introgression of African genes, often from drones, and this can be found even when the mtDNA shows the mother to be European.

Whether or not a colony is Africanized is not an "either/or" situation but, using these methods (and there are other, newer methods now available, i.e., "microsatellite DNA"), one can get an idea of the degree of Africanization (hybridization) in any one colony or population of colonies in an area. This data is very informative in determining the progress of Africanization and over time can show whether the process is continuing, slowed down, or even stopped.

Because of the expense, not many studies have been able to incorporate all possible kinds of analyses on any one set of samples, but with the help of several collaborating laboratories, we have data on a set of 17 colonies collected in the Tucson, Arizona area in 1994-95.

Method

Samples of newly emerged bees were collected from swarms which had been transferred to Langstroth hives. Samples for morphometrics were placed in 70 percent ethanol until analyzed by the USDA-ID procedures (Rinderer et al. 1993). Other samples were placed on dry ice (-70°C) and transferred to an ultracold freezer (-72°C) until analyzed. MtDNA analyses were performed using nucleases (EcoRI), and when necessary, ^{32}P probes on agarose gels (Schiff et al. 1994). Allozymes (MDH and HK) were extracted from thoraxes in TRIS buffer, separated using horizontal electrophoresis on cellulose acetate plates, and visualized using appropriate stains (Sheppard 1988; Del Lama et al. 1988; Spivak et al. 1988).

Results

The results of the several analyses conducted on 17 colonies are presented in Table 1. I present the FWLN in a separate column and give average FWLNs to emphasize the relationships found between this character and the other, more definitive, measurements. Average FWLN ranged from 8.735 mm to 9.362 mm; the colonies of both these extremes were Africanized based on mtDNA (Colony #SB 102) or HK-2 (Colony #SB 116)! By full USDA-ID morphometrics, only four colonies were identified as having any probability of Africanization maternal heritage as identified by mtDNA analyses. In addition, six more colonies were Africanized based on the presence of HK-2.

The average FWLN of the four colonies identified as having a level of Africanization by USDA-ID was 8.821 mm, well below the established 9.01 mm used as a "cutoff" between AHB and EHB (Rinderer et al. 1993) and only slightly lower than

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Fore Wing Length (FWLN) of Silverbell Colonies 1995

Colony#	FWLN	PAHB[1/]	mtDNA[2/]	MDH-1[4/]	HK-2	Defensiveness[5/]
SB 101	8.863*	.0864	E	.44	0.0	
SB 102	8.735*	.7083	A	.21	0.0	1
SB 103	8.877*	.0116	A	.73	.29	4
SB 104	9.135	.0000	A	.17	.17	-
SB 105	9.158	.0000	E	.33	.31	0
SB 107	9.085	.0004	E	.65	.19	4
SB 111	9.147	.0000	A	.60	.31	3
SB 113	9.269	.0001	A	.58	.27	3
SB 114	9.133	.0000	?	.50	.40	-
SB 116	9.362	.0000	E	.56	.29	0
SB 119	9.276	.0000	A	.40	.25	5
SB 120	9.268	.0000	E	.14	.33	0
SB 121	8.997*	.0000	A	.63	.26	-
SB 123	9.123	.0000	E	.27	.29	0
SB 124	8.757*	.9366	A	.52	.27	0
SB 126	8.872*	.9982	A	?	?	-
SB 127	8.921*	.9928	A	.98	.06	5+

Av. FWLN of mtDNA (A) = 8.999 (n=10)
Av. FWLN of p AHB (USDAID) = 8.821 (n=4)
Av. FWLN of HK-2 allozyme AHB = 9.199 (n=5)
Av. FWLN of mtDNA + Allozymes AHB = 9.070 (n=16)
[1/]p AHB: probability of a level of Africanization as determined by full USDAID morphometric analysis
[2/]mtDNA: mitochondrial DNA, A=African, E=European
[3/]MDH-1: malate dehydrogenase, "fast" allozyme, predominates in highly Africanized colonies
[4/]HK-2: hexokinase "slow" allozyme, only present in colonies with at least some Africanization
[5/]response to three hits with 2-lb. rubber mallet: 0=none, 5=maximum response
**Forewing length shorter than the 9.010mm used to initially screen for Africanization*

the average FWLN of the 10 colonies with AHB mtDNA (FWLN = 8.999 mm). Only two colonies (#SB 103 and #SB 127) had MDH-1 allozyme frequencies above 0.70 indicating a significantly elevated MDH-1 level; the pre-AHB feral colonies in the area had an average MDH-1 frequency of 0.201 (n=216) (Schiff et al. 1994). The highest level of MDH-1 found in pre-AHB feral Arizona colonies was 0.670 in one colony, and only four out of 230 colonies I (G.M. Loper) analyzed were over 0.60 (Loper, unpublished 1995). Thus, the overall MDH-1 frequency of 16 colonies in this study (0.48) was more than double the pre-AHB frequency.

I have emphasized FWLN in this paper because it is the one measurement that is relatively easy and inexpensive to make; all that is needed are glass slides, slide covers, a projector, a reticle, and a measuring stick. Thus, these measurements (10 bees/swarm) are being used by some commercial bee-removal specialists to report to clients as to whether the swarms are European or African. While it is true that bees from pre-AHB swarms in the Tucson, Arizona area had relatively long wings (>9.01 mm), there were still a few (7.4 percent) that had wings averaging less than 8.95 mm. It might be reasonable now, three years after Africanization and the extensive (95 percent) loss of the feral EHB colonies in the area due to tracheal and *Varroa* mites, (Loper 1997a), to expect that any swarm with average FWLN less than 9.01 mm is Africanized. However, it is quite obvious from the data presented in this paper that bees with wing lengths in excess of 9.2 mm can be Africanized. A similar conclusion was reached by research conducted in Mexico (Guzman-Novoa and Page 1994).

It is probably frustrating for beekeepers, and the public, as it has been for scientists, to realize the various methods used to determine Africanization do not give clear-cut answers. Our present high-tech methods still have inadequacies. For the practical side of beekeeping, a behavioral assay, perhaps as simple as hitting the hive lid with a two-pound mallet (Loper 1997b) may be all that is required to cull out unwanted Africanized colonies. BC

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Gerald Loper is a USDA scientist, retired, from the Tucson Bee Lab. More of his work can be found in the 21st Century *article on page 24.*

Late Season Management
Bee & Beekeeper Cooperation

James E. Tew

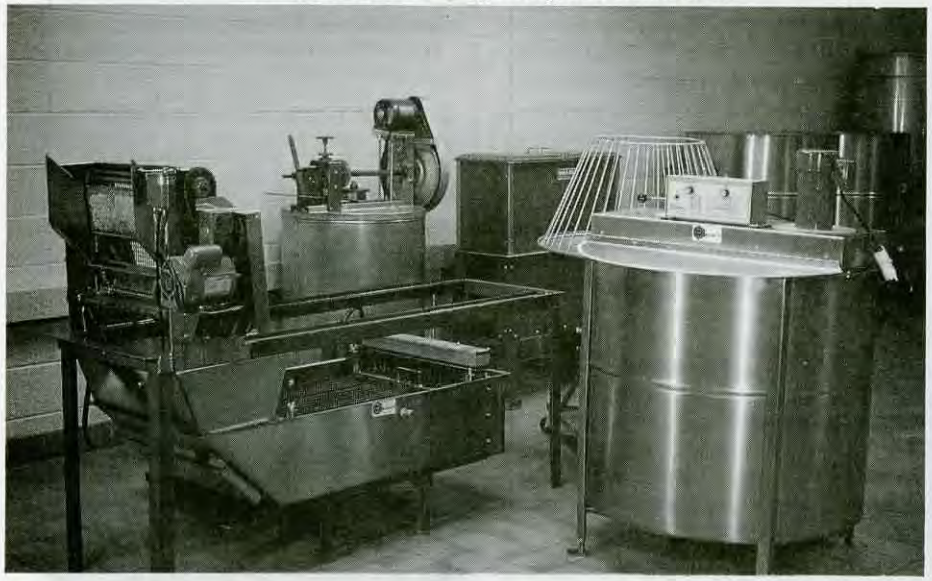
If you talk about bees more than a few minutes, some aspect of either bee or colony management will come up. After all, our understanding of bee biology, behavior, and physiology is for what purpose? To be a better hive manager. A quick search of my bee book library produced about a dozen books specifically on bee and hive management. Yet with all that information and experience, managing honey bee colonies is still a relative thing.

By the time you've gotten your colonies to this point in the season, you've been through winter, treated for mites and diseases, supered up, and tried to control swarming. How did you do? A quick look at the state of your hives at this point in time will give you a good idea.

REMOVING THE HONEY CROP It's getting to be late summer. The 1997 Spring crop is made - if you got one. Some seasons, you can do everything right and still not make a drop of surplus honey. The fading days of summer are a good time to "rob" your bees. "Robbing" is the procedure beekeepers go through each year when they estimate how much honey to take and how much to leave. Only experience can tell you how to deal with this situation. Take too much and your bees starve during the winter. Leave too much, and you've lost part of your crop. Always err on the side of leaving too much. So what's the best average numbers we have? A colony probably needs about 60-70 pounds of honey in most areas during most winters - no guarantees. An average two-story colony should weigh about 165-200 pounds. Some years this to too much while other years, the colonies may be left scant by Spring.

How are you planning on getting the crop off the bees? One simple way is to brush each frame free of bees. Bee escapes of various designs can be used that don't require individual frames being handled, but bee escapes require two trips to the yard - one to put them on and one take supers off. Many commercial operations use "bee blowers" (devices producing large quantities of low pressure air) or chemical repellents like Bee Go (butyric anhydride).

Most of us don't have an elaborate extracting setup but the principles are the same, no matter the size – efficiency and cleanliness.



It's surprising how many beekeepers will put open supers on the back of their truck and take off for the trip back to the extracting plant. Why shouldn't you haul supers that way? Isn't it good to blow off the few remaining bees rather than taking them back to the extracting house? Well....maybe...depending on your attitude toward your bees - but how about all the dust and dirt that gets thrown up onto the open supers that are all sticky with honey? All that dusty crud serves as crystallization nuclei. Treat honey supers for what they are - containers for human food.

STRIP THE COLONIES Doing anything more than taking off honey can be a real chore. The bees are numerous and defensive. But if you can gut it out, while the colony is open, it's a good time to put in *Varroa* strips (That is if you are practicing Fall *Varroa* mite control). Current recommendations are for one strip per each five frames of bees for five to eight weeks. *Varroa* mite populations need to be managed just as much as honey bee populations. It is important – even mandatory – to do something either in the early Spring or during late Summer/early Fall to control *Varroa*. Over time - with some successes and failures, you'll get a feel for how long to leave the strips in - but always stay with the recommended range on the pesticide label.

What about Tracheal mite control? Is that a late summer management problem, too? These parasites, due to their small size, are tricky to control – or to know when they need controlling. Ideally, you've had grease patties on your colonies all year and have kept the mite popu-

lation low. If the bees look good, put the patties on and leave them on (unless your state has specific regulations against leaving them on year-round). For the foreseeable future, assume you have tracheal mites and treat accordingly. Depending on your method of bee management and working conditions, I don't think I would try to do too much more than remove the crop and treat for mites at this time. Come back a few weeks later and check each colony's queen. Also look for any sign of any bee disease.

LATE SEASON QUEEN MANAGEMENT Fall requeening is very possible - even desirable. Consider all the problems that are currently possible in acquiring and installing new queens in the traditional Spring months. Get your queens from reputable queen producers. Most queens purchased in late Summer or early Fall have been "banked" in nursery colonies all summer, but there's not much you can do about that. In fact, it may not be all that harmful to the queens. Requeen as soon as possible after the honey is removed. Any colonies that don't take the new queens or are weak should probably be combined. Try to determine why the colonies are weak. If high levels of either mite seems to have caused the colony's weakness, the chances are good that you will not be able to get it through the Winter. However, if the hive appears to be salvageable, introduce queens in the same manner as you would introduce queens in spring months. I like marked queens (queens with a bright dot of color on their backs). Model car enamel paint or white-out are commonly used as the marker. If you don't have the time or you don't have queen marking experience, you can pay a bit more and most queen producers will mark the queen for you. Such queens are good ways to determine if the colony has swarmed or to help spot the queen in future queen replacement procedures. The queen is one of the colony's "Big Three" major components for productive hive management – (1) food stores, (2) diseases and (3) the queen's condition. Even if you don't always see the queen, constantly check her progress by observing the condition and organization of the brood pattern, the characteristics of her adult workers, and the presence of eggs – always check for the presence of eggs no matter why the colony is opened. Eggs tell you – (1) a queen was recently present, and (2) if the queen and colony are in sync with the current season. Lots of eggs are present in late winter/spring while there are declining numbers of eggs during fall and early winter.

Now's the perfect time to start 'hunkering down.' Mouse guards, ventilation, drainage and wind blocks are all important.

GENERAL MAINTENANCE While the colony is open, and as you check for the queen (or her evidence), check the general condition of the colony. Always look for American foulbrood (AFB). Any European foulbrood (EFB) has probably cleared itself up by now. There's some new virus infections popping up that seem to be related to the presence of mites in some unknown way. There's nothing you can do about it, but at least be able to recognize the problem.

Cull any bad combs during the *second* visit after the honey has been removed. Actually, you can do that at any time that the colony is open and inspections are being made. What are bad combs? Generally, they are misshapen or distorted and have too much drone comb. Some beekeepers recommend destroying comb that is more than three to five years old. That procedure is not commonly followed in the U.S. For many beekeepers destroying comb is too much work and expense for too little reward, however, old wax accumulates pesticides, environmental and in-hive toxins, dirt, propolis and 'stuff." Refreshing a super on a routine basis with new comb keeps these out of the colony and away from the bees. How about the hive bodies? Everything in order there? Remove any pieces of equipment that have rotted or need repair. Do all these repair chores during the Winter while sitting beside a nice warm fire. And don't let your colonies sit directly on the ground. You have to stoop too low, the bees get cold, and it makes the bottom boards rot too fast.

If you live in a warm climate, making Fall splits is not a bad idea if you want increased colony numbers next Spring. A single story colony with honey stores, a good population of both adult bees and brood along with a new queen can stand a "warm climate" winter quite well. If fact, such a colony can frequently survive a cold winter in most instances. Either way, watch them late next winter and early next spring in case they need feeding.

THE FALL FLOW Now, with everything discussed so far, what if a fall flow comes along? If you can get one, it's great. Most beekeepers want to keep the Spring crop separated from the Fall crop. Fall honey

Continued on Next Page

MANAGEMENT ... Cont. From Pg. 33

quality is normally not as high as the quality of Spring honey. Managing bees for a fall crop is much like the management recommendation for a Spring crop. Get the supers on before the flow and keep them coming as long as the bees need the storage space. One change that should be considered is to remove most - if not all - the supers before the fall flow is over. You want the bees to really pack out the two brood bodies with ripened honey. That will be your bees' Winter rations for the upcoming Winter. Many beekeepers don't like to Winter colonies on Fall stores. Supplemental feeding may be necessary in order to get the colonies up the desired gross weight.

EXTRACTING THE CROP. At this point in this discussion, several things could have happened with the year's honey crop: (1) You extracted the spring crop during the summer and all is finished, (2) You are presently preparing to extract the spring crop in the Fall, or (3) you have both a spring and fall crop with which to deal. That's neither good nor bad, but simply a fact of beekeeping – honey must eventually be extracted or at least processed in some way. Extracting the crop is not really beekeeping, but something more like specialty food processing. All the bee biology in the world won't help you understand how to design a filter system for an extracting layout. Extractors for small operations can be anything from a (new) modified plastic garbage can to a sophisticated computerized extracting contraption that will run 40 - 60 frames per cycle. The point is that at this time in late Summer/early fall, most beekeepers make the change from managing bees to processing honey - only the scale varies. As with stinging episodes, most beekeepers have their own extracting horror story that, in some way, concerns a runaway honey processing system in the kitchen or 2000 gallons spilled on the extracting plant floor. We all get our stories soon enough.

ORDER YOUR PACKAGES Can you believe it? By the time September or October rolls around, you'd better be ordering your packages for the next Spring season. Bee times have changed. For the next few years, it appears that package producers will barely be able to stay up with the demand. The early beekeeper gets the package bees from the right producer at the right time.

Late Summer can be equipment 'spruce up' time. The bees don't mind, the mess is kept outside, and you can spend Winter making new, rather than fixing old equipment.

STAY INFORMED Something else that usually happens during August or September are the fall beekeeper meetings. I know, I know...much of what is said at bee meetings you have already heard, but there are so many new beekeepers around, that it needs to be said again (and again). Honey bees, and beekeepers, have been passing through a cataclysmic period in beekeeping – *The Predaceous Mite Epoch.* It is critical to stay informed on all bee science updates and not those just on mite control. There are still beekeepers who are selling colonies too cheaply, providing pollination services too cheaply, and selling their honey too cheaply. The successful beekeeper is informed with good, dependable knowledge. If you state doesn't have a Summer or Fall meeting, consider going to one of the regional or national meetings. It will be good for you to get idea of the "big" beekeeping picture.

WINTER PREPARATIONS Who feeds Fumadil-B? Not nearly enough of us it seems. Just because we have mites does not mean that any other bee disease has gone away. AFB, EFB, Nosema, and chalkbrood are still out there doing their part to harm colonies. Fumadil-B is another expense that is added to the list of important bee expenses, but numerous research studies have shown that colonies in cool climates that were fed Fumadil-B winter better and build up faster than colonies not fed the medication. "No, you can't feed Fumadil-B in your tracheal mite grease patty," is the answer to a commonly asked question about Fumadil-B. It must be fed in sugar syrup in the Fall and stored as food so the bees have access to its medicating effects throughout the confining Winter months.

Once the Fall flow is clearly over, timely beekeeping practices become important. But what is timely? When is the actual critical time to begin preparing colonies for winter? Surprisingly, there are no absolute deadlines. Many hard-core wintering procedures can be done in August or September anywhere in the U.S. without ill consequences. Many times, bee colonies can survive quite well with *no* help at all from beekeepers, but that's simply leaving too much to good luck and chance.

In warm climates, begin Winter preparations in October or even early November. In cool climates, begin Winter preparations in September or early October. Ironically getting entrance reducers in place is one of the most demanding events. Entrance reducers keep mice out of the hive. Mice, too, must make Winter preparations and unlike us, they stay on schedule. Their successful Winter survival depends on finding a warm dry place to pass the Winter. A bee hive is perfect. However mice are inconsiderate hive guests. They chew up comb. They defecate inside the hive and they keep the colony disrupted. Over a long Winter, they can really wear out their welcome. Entrance reducers must be in place *before* the mice take up residence. That is the reducer's purpose – to keep out mice not to keep out the cold.

Late Summer/early Autumn is a good time to standardize and organize a yard. Get your colonies off the ground, fix gates or fences that surround the colonies. Cut back over-hanging limbs, and straighten up colonies that are out of plumb, making sure the back is just a tad higher than the front. It's so much easier to do these maintenance-type things before the weather gets cold.

So long as you are tidying things up in the yard, how's the paint on

the hives? Use latex paint and don't put it on when it's below 40 degrees. Painting does not just keep colonies neat, but it also protects the wood from water penetration. Lumber costs have climbed so high that the labor and expense of painting hive equipment are worth the effort.

If hives are to be packed (insulated), you can get on with that at this time, too. Most beekeepers don't pack their colonies, but it's still an accepted practice. In years past hives in cool or cold climates were packed and wintered outside or they were put into cellars (cellaring) built for that purpose. Then and today, the cellars had to stay around 40-50 degrees, and have provisions for significant air movement. It would appear that cellaring bees was too much work with results too erratic. Regardless, neither packing nor cellaring are routinely recommended now. However, there are always those who want to try. Wrap your hives in black roofing felt. The black felt absorbs heat and keeps cold air out of cracks and crevices in the hive walls. Don't use true insulation. It absorbs water and becomes soggy. I'll bet you (with no data) that a piece of Styrofoam beneath the bottom board and beneath the outer cover would help the bees a bit.

PROVIDE FOR VENTILATION – even if no insulation is used. Warm air rising off the cluster has more water vapor than can be held as the air cools. It condenses within the hive. Though I have recommended previously the reduction of the bottom entrance, now I am suggesting give a new top entrance – probably about a quarter to three eighths of an inch beneath the inner cover. Two winter things happen at this point: (1) air can circulate (and escape) thereby stopping condensation from forming within the hive and (2) the bees are given an upper entrance. This top entrance is useful in cold climates where snow and ice may block the lower entrance.

SPEAKING OF THE INNER COVER It should be turned over so that the deep side is down, but don't do this until the fall flow is over. The deep side of the inner cover gives the bees more space to cluster over the frame top bars and thereby distribute Winter food more easily throughout the hive. Colony life goes on if this procedure is not done, but it is one of those little things that is helpful to bees. Now, here's the rub....if you reverse the inner cover, you must be back there in late Winter to turn it back over before the Spring flow starts. Obviously, the bees would fill this space with burr comb and honey causing a bit of a mess to clean. Remember, deep side down during cold months and shallow side down during warm months.

> *"In managing your bees during late Summer and early Fall, as always, do no harm."*

COLONY LIFE As you work your way through your colonies during late Summer, watch for those that are light in honey stores. It must be said that all seasons are not surplus years. Sometimes the hives just don't get a good flow. If a colony appears to be light, but otherwise healthy, feed it thick syrup. Mix up sugar syrup as heavy as you can make it. Syrup this heavy will require some heat. The syrup made for spring stimulation can be tap-water warm, but that doesn't work well for winter stores. There are many types of feeders that you can use to get winter feed to the hives, but any feeder should: (1) supply only the amount the bees can take before fermentation occurs, (2) be readily usable by the bees, and (3) not incite robbing.

ROBBING BEES Once the fall flow is past, you should be alert for robbing activities - especially as you manipulate colonies. During a good flow, almost anything goes – requeening, supering, or making splits - all without much concern by the bees. But once the flow is over, "Thy neighbor's food supply is fair game". You won't miss the symptoms of robbing. Bees will be fighting while others frantically try to get into the hive at any crack within the hive walls. Close down the hives under attack. Simply stuff grass into all the hive openings. Better yet - move the colony to another location where competition is not so stiff.

THE OBSERVATION HIVE If you have an observation hive you should be deciding now what the plans are for its future. Most small observation hives won't survive a cold Winter. You can't just keep sugar syrup on the colony all Winter - too much moisture. How big should your hive be to survive the Winter? I don't know, but I can tell you that we have had a nine frame observation hive (three frames wide and three frames high) that has died for the past two Winters. Give special consideration to observations in public places such as museums or farm markets. I am very near recommending that the "average" observation hive be broken down sometime during the fall and the bees added to another colony. Just like a vegetable garden - start the observation hive up again next Spring. There's little enjoyment in watching the bees die a slow, messy death.

CONTROLLING SKUNKS, RACCOONS, AND PEOPLE Pests like these can really be a nuisance. In the case of small pests like skunks and raccoons, get the hive off the ground or fence them in some way. As for people who steal or vandalize, that is more of a problem. All you can do is use common sense. Hide the hives or move them to more protected locations. In any case, do something before the colony goes into hard Winter. Continued winter disruptions from critters like these make successful Wintering more difficult.

In managing your bees during late Summer and early Fall, as always, do no harm. In our efforts to help, we all-to-often injure more than we help. From this discussion, select the items that you think will help you and your bees close down one season and prepare for another. Hive management is just one big cooperative cycle between you and your bees.

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For a Small Operator
HONEY HOUSE

Howard Scott

We have all seen elaborate honey houses in this magazine with all the latest equipment and super extractors that can process up to 80 frames at once. But what about the small operator who still wants the fun of churning out his own honey? Is the prospect economically out of reach? Does the limited use make the idea impractical? Is it downright inefficient to build a honey house when commercial beekeepers will often process honey for a small fee?

According to Peter Chamberlain, of Pembroke, Massachusetts, the answer to the above questions is: "Build your honey house, and it shall be used." Chamberlain, a four-year hobbyist with two hives, decided to create a small honey house in his backyard shed.

He tells it this way: "I was borrowing an ancient manual extractor that I had to crank by hand. Not only was it hard work, but it was also dangerous. The handle, which inserted into the gears, was always flying off. It could have killed me. Once the handle fell into the barrel and chipped the wooden handle. I knew there must be a better way without spending a fortune."

Chamberlain had a perfect place, a 15'x 20' backyard shed that sat on a cement floor and had a wooden ramp. He used the facility to store his tractor and other equipment. He moved these stored items to one side, and set aside half the shed for his honey house. At a bee club meeting, he heard about a former beekeeper who was selling off old equipment. He called the beekeeper, who said that he had a whole bunch of equipment for sale, including an automated four-frame extractor fully rigged to work. Chamberlain visited the beekeeper and found to his delight that the extractor was perfect.

Chamberlain's converted honey house.

Chamberlain says, "It was just the sort of processor I was looking for. It worked. It looked good. The barrel was shiny and clean. The old-timer had set up a refrigerator motor to power the extractor, connected it to an on-off switch, and set the whole thing on a wooden base. To eliminate vibration, the extractor was connected to the base with struts that could be tightened by turning a strut connector and loosened for cleaning by unscrewing. The juryrigging was ingenious. In addition, he threw in all sorts of ancillary equipment: an electric capping knife, a concave screen for a large pan, two jigs for putting together frames, and a tapered hammer for nailing together frames. The price for all this was only $200."

Chamberlain set up the extractor in the middle of his space. Set on the base stand, the top reached shoulder height. That way, there would be no broken backs. The stand contained an ingenious wooden frame with pegs set below the spigot that could be used to drape strainer cloth across it or to hold a strainer.

Chamberlain says: "The neat thing about the contraption is how well it works. The whole design was well-thought out. For example, the motor and power pulleys are encased in heavy metal braces, reinforced with angled side braces that sit on thick wood blocks. This minimizes vibration. There are two large pulleys, which, connected to the motor pulley, create smooth, steady movement. The way the extractor is held

steady – using struts and strut connectors – is elegant, yet simple."

Chamberlain next had to address the uncapping operation. From the local hardware store, he purchased a galvanized tank. He set the large concave wire strainer on top of the tank. The strainer overlapped the tank on all sides by about two inches. A friend built a 2 x 4 board that sat across and above the strainer. The friend cut out spaces in the strainer so it would fit. Then he cut angled wedges so that the board sat on the tank. Finally, the friend screwed a thick screw into the center of the board and sharpened its point. Chamberlain put the tank on a long, low stool, so he wouldn't have to bend over too much. He built a shelf on the nearby wall to hold things and to make his work go without interruption. With the electric capping knife that the beekeeper had sold Chamberlain, he was now ready to uncap frames.

Finally, Chamberlain had to attend to his bottling operation. He purchased a five-gallon pail that has a gate at the bottom from a bee supplier. He put all this on a low stool and rigged a cloth strainer holder below the faucet. This is for the final straining before the honey goes into the bottle.

How does his processing factory work? "Perfect," answers Chamberlain. "Better than perfect. It's like a symphony. I remove wax cappings with a minimum of fuss. I angle my frame on the 2 x 4 board so that it is secured by the screw, and run my hot knife down the frame. Angling the frame at 120 degrees helps in the cutting. Often, in one or two motions, I have the all the cappings off. I also use the board to scrape gunk off the knife into the wire screen. In addition, I can lean the knife handle against the board when I'm not using it. The wall shelf also comes in handy for putting things down. With the right equipment, this messy procedure can go quite smoothly.

"As far as the uncapping goes, the wax stays on the wire screen and the honey drips into the galvanized tank. I let it stay a day or two for all the honey to drip down. Later, the wax can be cleaned up by the bees, and the honey can be processed.

"Then I place four frames at a time in the extractor and turn it on. It takes about three minutes a side to remove all the honey. I use a double metal strainer – purchased at a bee supply house – to filter out wax particles. Finally, I pour honey into the five-pound pail with the spigot, and filter it a third time through strainer cloth, which stays pretty clean. It doesn't get filled with wax particles. It's just a precautionary measure. Then I label my bottles, and the process is complete."

Chamberlain offers one bit of advice: "I set up a bucket of hot water while I'm processing. Always have hot or warm water. Your hands will get quite sticky, and it becomes hard to work."

Chamberlain is also into woodworking. He has used the jigs and tapered, magnetic hammer obtained from the beekeeper to build frames. He says, "It really makes the assembly go like a production line. You set in the vertical pieces, lay across the horizontal segments, and then hammer them together. Then you turn the jig over and hammer in the side nails. Then you use the angled cleat to punch in the wax guides. The small hammer that came with this stuff is terrific. It's just the right size. I would never have bought something like this, but it makes the job so

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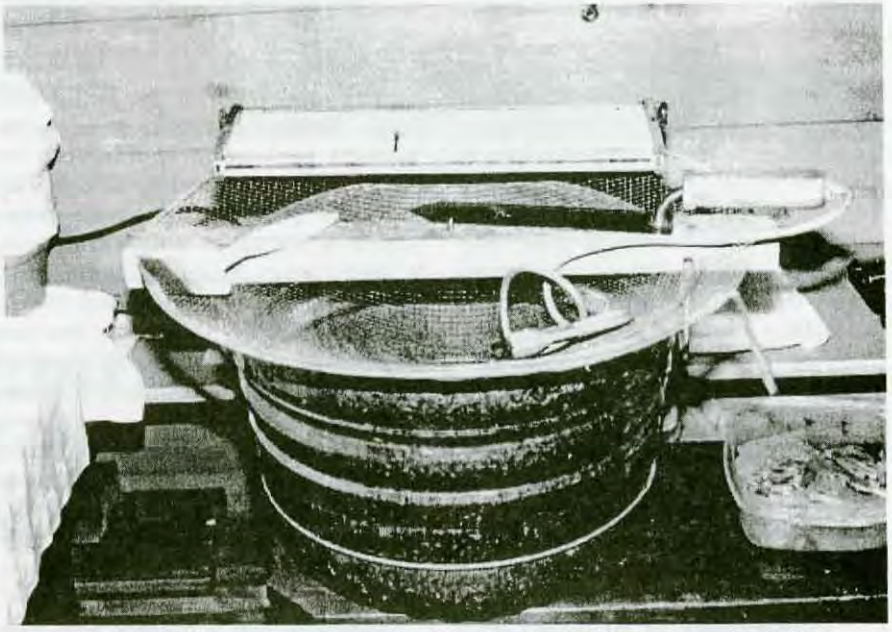
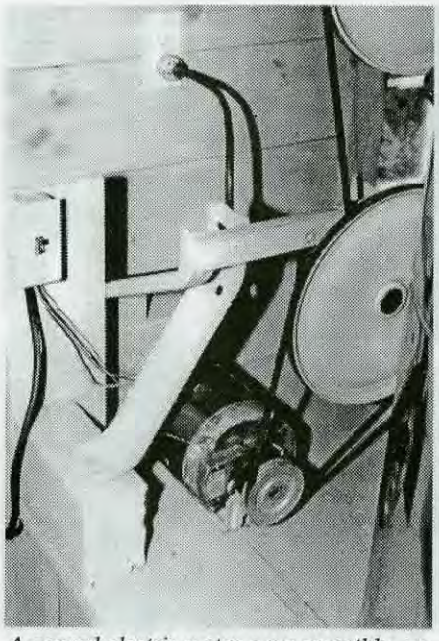
An inside view, showing uncapping tank, extractor, shelves, stands, and Peter.



The uncapping tank and screen setup sits conviently on a nearby table.



A geared electric motor runs smoothly, especially since the tank is securely fastened.

Liquid honey runs out of the gate. It can be first-strained by having a cloth filter stretched over the wood frame, and then second filtered below.

much easier."

Between new and secondhand purchases, Chamberlain estimates that he spent about $250 on his honey house. He finds this sum amazingly small since a new comparable manual extractor alone runs $330. In addition to the savings, he feels he's met an interesting old-time beekeeper who was "a genius in his way." He expects to harvest 40 to 60 pounds of honey per hive, or 80 to 120 pounds annual harvest. If he sells half his harvest, he should recover his investment in two years. Last year, one quickie sale was for 20 pounds at $3/pound wholesale.

Chamberlain is so happy with his honey house that he likes to share it. Because of the setup and room, he often extracts honey with a fellow beekeeper. In addition, he welcomes other local beekeepers to use his processing equipment. Chamberlain says, "With a minimum of instruction, I can tell them what to do, then leave them and they'll be fine." Finally, he invites the bee school attendees to visit as a way of showing them what's involved in processing.

Chamberlain concludes: "The pleasure of having my own honey house is that it lets me do everything myself. It brings the hobby full-circle." BC

Howard Scott is a hobby beekeeper and freelance writer from Pembroke, MA.

Southern Beekeeping

August & September in West Central Florida

Ed Mabesoone

August in West Central Florida is by no means the time of year for honey production. Saw Palmetto finished by mid-July, and the Cabbage or Sable Palm has finished by the beginning of August. There are a few Summer wildflowers in bloom, as well as some Coral Vine. I have planted all my fence areas with Coral Vine, which will furnish enough nectar for colony maintenance but not much more. It's great stuff during a nectar dearth because it blooms for most of the year until it freezes, and the bees seem to love the stuff. Coral Vine is a very attractive plant with a bloom similar to a Bleeding Heart. Farther north in some of the good clay soil areas, Partridge Pea is in bloom and farther south, Brazilian Pepper (Florida Holly) and Melaleuca (Punk Tree) are blooming.

The area where I live is about 50 or so miles north of Tampa, Florida, and I'm about four miles from the coast. The days are long and hot with the morning temperature starting out somewhere in the 80s and ending up in the high 90s or low 100s, and usually by 10:00 a.m. the bees are already out gathering water to help cool the hive. The bees have worked hard since about February, so it's about time to give them a break and make sure that they are ready for the Fall.

Just because the bees are not out collecting enough nectar to make surplus honey doesn't mean it's not a busy time of the year, at least for the beekeeper. After the sale of a good honey, pollen, propolis, and wax crop, we all have a tendency to want to relax for a while. We do, however, have to remember that the bees need to be taken care of. It's time to treat with medications and pesticides.

Here in West Central Florida, the colony populations are starting to decline somewhat, and it's time to get down to the business of colony maintenance. Because of the hot and fairly dry climate, coupled with the fact that there are not too many days out of the year that the bees don't fly, we have been blessed, at least in this area with a lack of tracheal mite problems. The *Varroa* mite, on the other hand, is a vicious predator, and if you haven't treated with Apistan strips by mid-August, you may already be too late. *Varroa* has had such a devastating effect on feral colonies in the area that the calls I get to pick up swarms have gone from hundreds five years ago to four last year and none this year. It's kind of scary to think that we've lost that many feral colonies in such a short time.

Feeding medications and using pesticides seem to be a problem for a lot of beekeepers; however, if the manufacturers' instructions are followed, they are really easy to use. The key words here are: *Follow the directions.* A lot of time and money was spent doing research on each of these medications to ensure that they have the proper effect on the disease or pest you're trying to fight. When you start to second-guess the directions, you're not only wasting all that research, but you are putting your bees at risk. If you don't understand the directions, call your supplier, your state bee inspector, or even the manufacturer for help. The price of some of these products can be a little hard to take sometimes, but if you compare it to the replacement cost of a colony, they are really cheap.

I have a regular schedule of events concerning medications and pesticides that I follow each year, starting in August and continuing until about October. And *I keep a record book on each one of my colonies.* Keeping good records is a must, and every beekeeper should have no excuse not to do so.

"This is the time of year in our part of the world to consider medications."

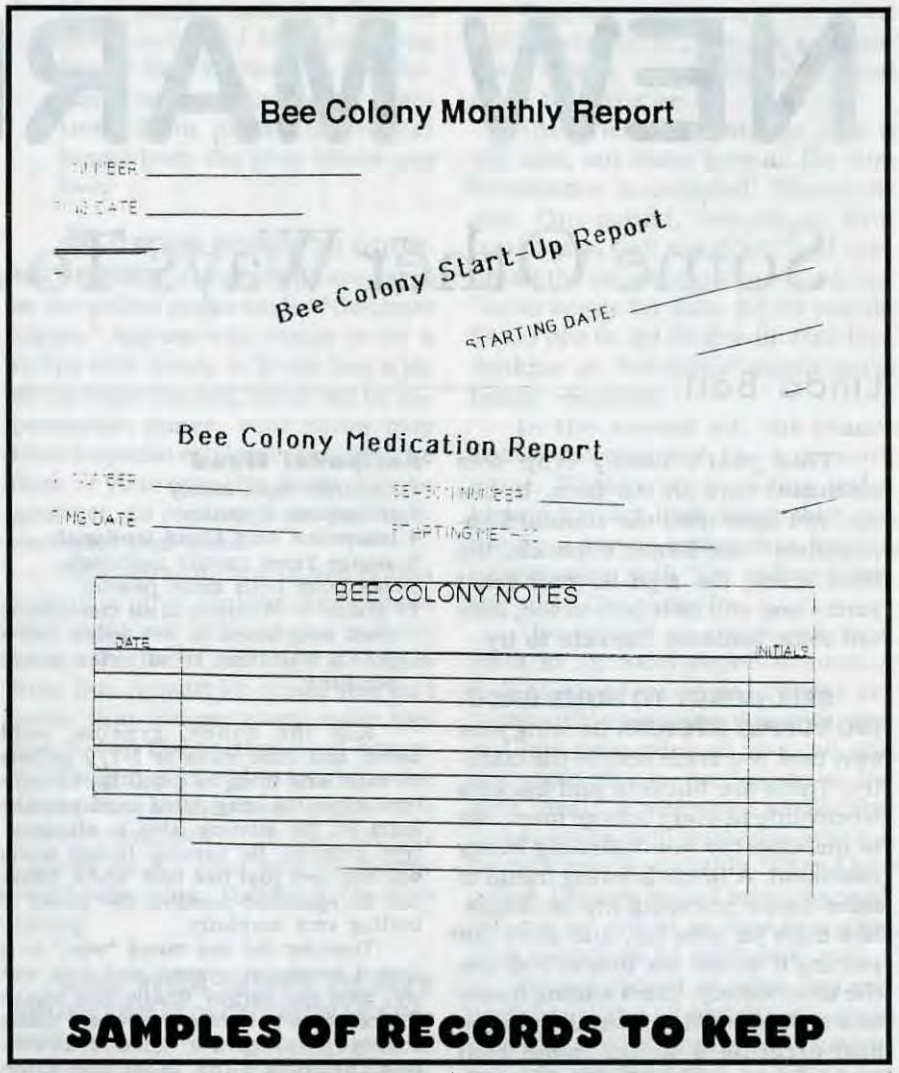
The commercial operator that runs several thousand colonies obviously doesn't have the time to keep records that are as in-depth as the hobbyist or sideliner, but they also keep records. It only takes a couple of minutes to fill out a record book while you're inspecting a colony, or even an entire beeyard, and your state bee inspector will love it when it comes time for your annual inspection. Believe it or not, the memory does fade after a while; I can vouch for that. Sometimes I can't tell you what I had for dinner yesterday, but I can tell you what my bees have done for several years past. There doesn't have to be a lot of writing involved in the records; check boxes and date lines are just fine – anything to help you keep track and give you the overall picture of

what your colonies are doing or not doing. Most of my record forms I've made up myself but I have gotten several from the writings of Dr. Tom Sanford at the entomology department at the University of Florida and have adapted them to fit my needs.

Another important thing to remember in this area around this time of year are colony stores. Since there really isn't much for the bees to forage on, I make sure the bees have plenty of pollen and honey to get them through the Winter. I make sure they have at least three full frames of honey and a frame of pollen in each brood box. If they don't, it's time to feed them. There are several good pollen substitutes on the market which can be fed dry, in patty form, or mixed with syrup. Sugar syrup can be mixed at home or purchased bulk, whichever fits your needs. In most of the literature I've read, I've found that a 1:1 (by weight) ratio syrup is recommended to make the bees produce wax and rear young if conditions are right, and that a 2:1 ratio is recommended to make them build up stores. However, another little trick that I learned is to limit the number of holes in my feeder cans to three or four when I want build-up and increase the number considerably to about 10 when I want stores. Just remember: The more holes the faster the feed goes, so you have to keep on top of them to keep them full. In most of my colonies, I've found that I don't have to feed, so the only feed they get is what I use to feed medications.

Now that the bees are taken care of, it's time for golf, water skiing, tennis, swimming, camping, and the rest of the relaxing things we humans do, especially the cool ones at this time of year. Just remember that if your bees are strong and healthy going into the Winter, chances are they will be strong and healthy come Spring. BC

Ed Mabesoone is a hobby beekeeper and video producer from Brooksville, FL.



SAMPLES OF RECORDS TO KEEP

NEW MARKETS

Some Other Ways To Sell Honey

Linda Batt

This year's honey crop was abundant here on our farm. If, like me, you have tried the standard approaches – the farmer's market, the local store, the sign in your front yard – and still have jars to sell, here are some unusual markets to try:

SELL HONEY TO HOME BREWING SUPPLY STORES. Brewing your own beer is a craze across the country. There are buckets and buckets fermenting in every college town, not to mention the one bubbling in my basement. A home brewing friend of mine keeps pestering me for honey. She buys jar after jar, and she's not putting it in her tea unless you use the term loosely. She's adding honey to a special holiday beer she makes, and creating a honey mead that knocks your socks off.

Take out the phone book and look in the yellow pages under "Beer Home Brewing Equipment and Supplies." The Danbury, Connecticut, phone book lists five supply stores. The St. Lawrence County, New York, phone book – all of our white and yellow pages together are less than an inch thick – lists one shop.

I called, and all of these stores carry a book titled *The New Complete Joy of Home Brewing* by Charlie Papazian. This book says in part, "Honey is in a class of sugar by itself and should not be ignored for use by the home brewer. Its contribution to the flavor of home brew is wonderfully unique. Many an award-winning, flavorful beer has been made with a combination of malts and honey."

This book also contains recipes for mead. Antipodal mead calls for 15 pounds of light honey. Chief Niwot's mead requires 13 pounds of honey.

Here's one complete recipe:

Antipodal Mead

15 pounds light honey
1 tablespoon Gypsum
4 teaspoons Acid blend (optional)
½ ounce Yeast extract (optional)
¼ teaspoon Irish moss powder
14 grams or ½ ounce dried champagne yeast rehydrated in pre-boiled 105°F (41°C) water for 10 minutes before pitching

Add the honey, gypsum, acid blend, and Irish moss to 1-1/2 gallons of water and bring to a boil for 15 minutes. Skim the coagulated meringue-like foam off the surface (this is albumin-type protein). Be careful: Honey worts will boil over just like beer worts. Leave the lid ajar and monitor the onset of boiling very carefully.

Transfer the hot mead "wort" to a closed fermenter system and cold water. Seal the carboy briefly and shake the contents to aerate the "wort." Glass carboys are ideal for mead fermentation. Rehydrate the yeast and pitch when temperature is below 80°F (27°C). Ferment to completion, then carefully rack into a secondary (carboy) fermenter and let clear. Bottle when mead has cleared. It is ready to drink as soon as it has cleared.

Point out the recipes in the book or bring along a printout of the above recipe and offer to supply the honey for beer and mead. These stores sell all the other ingredients for brewing and will probably buy your ingredient. Since the recipes call for large amounts of honey, I suggest bottling some of your product in five-pound jars. This cuts down the bottling cost and requires less handling for the customer.

SELL HONEY TO GIFT BASKET BUSINESSES. Have you ever given or gotten one of those wonderful baskets loaded with fruit, gourmet jars of jam, and more? Honey is a natural addition to the store of goodies offered in one of these.

Still have the phone book out? Look under "Fruit Baskets." You are sure to find business after business that makes and sells these gifts. For this market, why not purchase several unique jars from Pier 1 or a similar store and put your honey up in style?

I found green-tinted, pear-shaped jars made in Spain. They had a cork stopper, and when I filled a traditional jar and poured the one pound of honey into the imported jar, I found it held just the one pound. The jar could be reused for salad dressing, syrup, cream, or other condiments after the honey was gone. The cost was $2.25, but the honey in that jar had taken on a real gift appearance.

I also found an interesting bottling option at my local Dollar Store. The store sold for, you guessed it, one dollar, a squat jar with a resealable old Mason jar-type lid. This jar held two pounds of honey and had an old home-cooking appeal.

Take some of the unusual jars and some of the good old traditional jars to show the shop owner. Add the cost of the fancy jar to your price just the way you would the cost to bottle in standard pound jars.

SELL HONEY TO LOCAL RESTAURANTS. If a restaurant does a brisk breakfast business, honey might be a nice additional condiment for the table. After all, McDonald's knows how people like their biscuits and offers honey with breakfast, so why shouldn't other restaurants add it to their choices? Truck stops might be my first restaurant stop. Breakfast is a big mealtime there every day. If the restaurant has an elderly clientele that often orders tea with lunch, you might also make a sale there.

Anticipate the problem of serv-

ing and offer plastic bears, cylinders or honeystix. And remember to tell the owner or manager that your honey is local, fresh, healthier, tastier, etc. than the supply outfit stuff he can purchase.

SELL YOUR HONEY TO HEALTH FOOD STORES. These stores are listed in the yellow pages under "Health Foods-Retail." You can't get a much healthier food than honey, and a local product is better than blended, processed honey shipped in from out of state. My customers have traditionally believed that honey gathered from local flora helps with their allergies. This has not been scientifically proven, but enough people believe it to make your local honey more marketable. Also, studies do show that some of the beneficial effects of honey are lost when the honey is processed to keep it from crystallizing, so your product is actually better for the buyer.

To help clinch this sale, you might take along an article on the antibacterial properties of honey that appeared in this magazine (September 1995) and show the owner this list of health benefits of honey. I've written several researched articles on the subject, and this list summarizes some of my findings.

1. Honey is a natural antibacterial substance. Scientists agree that the combination of high sugar content, high acidity, and the presence of hydrogen peroxide give honey its antibacterial properties.
2. Honey helps the body's ability to take in and use calcium. It may help prevent calcium loss and weak bones in older women.
3. The Chinese proverb, "In times of stress, sweeten the tea," has been proven correct by Dr. Bonnie Spring. Her lab showed that people given high-glucose foods were more relaxed two hours later than subjects given high-protein foods. The home remedy of taking a tablespoon of honey before bed to make you sleep really works.
4. Athletes and their trainers often use honey for energy and staying power. The glucose, fructose, and water in honey rapidly assimilate into the bloodstream and provide energy for exertion.
5. Many people, including Charles Mraz, author of Health and the Honey Bee, believe you can become immune to allergic reactions from pollen if you eat honey from the area where you live.

SELL YOUR HONEY TO GOURMET SHOPS. These shops are listed in the yellow pages under "Gourmet Shops." Anyone who wants to try a recipe with honey in it can buy a jar at the supermarket, but it will be supermarket honey. Your honey may have a special quality because of the flora in your area. Its flavor may be gourmet, so market it for its superior color and taste.

Take along a copy or two of Bon Appetit or other cooking publications and point out recipes that require honey. I've been cutting out recipes from Bon Appetit for over a year so I know that almost every issue has one or two dishes that need honey. You might also order or show the owner how to purchase copies of a honey cookbook. The Bee Supply Catalog for A.I. Root sells two honey cookbooks plus *Putting It Up With Honey.*

SELL YOUR HONEY TO GIFT SHOPS FOR THE CHRISTMAS SEASON. Honey is a great gift for a teacher, for an aunt who has everything, for the tea lover, for any number of people. If you bottle some of your honey in those jars you've gotten from Pier 1, it will look fetching, and the jar will remain a gift long after the honey is gone. Tell the store owner that when you are pushing your product.

If you only have traditional jars, gift-wrap them in clear cellophane and tie them with ribbon. Tell the store owner that customers will be able to see the product and will also be able to give it without any further packaging fuss.

SELL YOUR HONEY BY PLACING CLASSIFIED ADS IN SEVERAL PAPERS. Regular column-inch ads are expensive and may not get results, but classified ads in small local papers are inexpensive and often noticed. Some Pennysaver, Bargain News editions charge the person buying the paper and do not charge anything to place an ad. There's no better deal than free.

Country papers have classified sections for farm products and produce. Those papers are a natural place to advertise.

The briefer the ad, the less it will cost, but make sure all the vital information is included. "Honey for sale. One-pound, two-pound, five-pound jars. Call 344-6592" will supply all the information you need, but "Local honey for sale. $2.25 one lb, $4.00 two lb, $9.50 five lb. Call Don Jenkins at 344-6592" might get a better response.

In the second ad, the reader knows the cost and has a person's name. Studies show callers feel a higher comfort level when they can ask for a person rather than begin a conversation with "I'm calling about the ad in the paper."

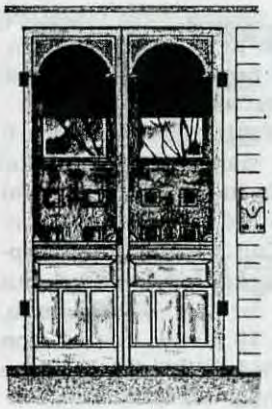
The second ad could run for a week in my local paper for around $15 at standard rates. Papers are constantly promoting ads with special one-time rates. If you call and say you'd like to participate in the next "deal," a motivated small-town salesperson will call you when a bargain rate is available. When I just called, the rate hadn't been changed, but my ad would go into two other area papers at no additional cost.

Keep a record of sales you can attribute to the ad and place it again only if it seems profitable. Customers you get from the ad will come back again and again, so you will get repeat sales without repeating the ad.

Now that you have all these new markets, don't forget the standard sales methods for small amounts of honey. The sign in the front yard, the stand at a farmer's market, your local gas station/food mart will always move some of those jars off the storage shelves in time for the arrival of the new Summer crop.

I always like to sell every last jar. The bees have worked hard, and it's good to see their labor fully appreciated by consumers. BC

Linda Batt is a sideline beekeeper and freelance writer from Rensselaer Falls, New York.



Ann Harman

Home Harmony

Gad Zooks! More Zucchini!

It's getting near the end of summer and your garden has rewarded your efforts with all kinds of good vegetables and fruits. One plant that never seems to disappoint us is the zucchini. By this time in the summer you've served zucchini in almost every imaginable way and the plants show their appreciation for this in producing more zucchini.

We do have to thank the bees for their efforts in producing zucchini. It is a member of the squash family, along with pumpkins, winter squash and gourds. The zucchini produces golden yellow blossoms, the shape of which is reproduced in some Navajo jewelry. The squash blossoms are only open for one morning, and may close mid-morning if the weather is very hot. Since the members of the squash family produce separate male and female flowers, some type of insect pollination is necessary for fruit set. Honey bees are given the most credit for pollination. However, bumble bees and some of the smaller native bees do visit the flowers.

Zucchini's mild flavor makes it suitable for a wide assortment of dishes. The water content of zucchini is very high which has to be taken into account when cooking. Zucchini can be served raw in salads, stuffed, used in baking cakes and quick breads, in casseroles, and can be made into relishes. You can even use the blossoms, usually served stuffed. All in all, zucchini is a very versatile vegetable.

ZUCCHINI-STUFFED CHICKEN BREASTS

This recipe for stuffing chicken is easily made and is quite different. The honey is used as a final glaze.

3 tablespoons butter
2 medium zucchini, shredded
3 sliced white bread, crumbled
1 egg, lightly beaten
1/2 cup shredded Swiss cheese
1/2 teaspoon salt
1/8 teaspoon pepper
3 whole chicken breasts with skin on
2-3 tablespoons honey
salt

To prepare stuffing: In a medium saucepan, melt butter, add zucchini and cook, stirring, at medium heat until just tender, about 2 minutes. Remove from heat, add bread, egg, cheese, salt and pepper. Stir. Cut chicken breasts in half through the breast bone. Carefully loosen skin on one side of the breast to form a pocket. Stuff pocket with dressing and secure skin with skewers or toothpicks. Place chicken pieces in a 9x13 inch baking pan, skin side up. Bake at 400° for about 50 minutes until a beautiful brown and fork-tender. Remove from oven and brush lightly with honey and salt.

Honey Of A Cookbook
Alberta Beekeepers Association

SWEET & SOUR ZUCCHINI

This next recipe makes quite a lot and would be a great addition to a picnic. You need to make it a day in advance, which makes it a convenient dish. It is a nice change from cucumbers in vinegar.

4 small zucchini, thinly sliced
1/2 to 3/4 cup honey
1/2 cup white wine vinegar
1/3 cup vegetable oil
1/4 cup chopped green bell pepper
1/4 cup diced celery
1 tablespoon chopped onion
1 teaspoon salt
1 teaspoon black pepper

Combine all ingredients in large glass or ceramic bowl. Cover and refrigerate overnight. Drain and serve chilled or at room temperature. Makes about 2 quarts.

Sweetened With Honey
National Honey Board

FRESH LEMON-ZUCCHINI PICKLES

Or you might like this recipe for a fresh pickle. Made with lemon juice, it is different and refreshing.

6 medium thinly sliced zucchini
1 chopped green pepper
2-3 sliced green onions with tops
2 teaspoons celery seed
1/2 cup honey
1/2 cup lemon juice or 1/4 cup cider vinegar
1 thinly sliced, halved lemon

Place the first 4 ingredients in a large bowl. Add honey, juice or vinegar, and lemon slices. Refrigerate overnight in a covered jar. Keeps well for several weeks.

Feasting On Raw Foods
ed. by Charles Gerras

HONEY-KISSED CARROT ZUCCHINI KUGEL

Here is a splendid combination of zucchini and carrots that can accompany a meat salad to make a complete meal.

1/2 cup water
1-1/2 cups grated carrots
1-1/2 cups grated zucchini
1 onion, finely diced
3 eggs, separated
1/4 cup honey
1-1/2 cups peeled and grated potatoes
1 cup matzo meal
1 tablespoon chopped fresh dill
1/2 teaspoon salt
1/4 teaspoon pepper

Combine water, carrots, zucchini and onion in medium saucepan. Simmer about 4 minutes or until vegetables are soft; cool slightly. Whisk together egg yolks and honey in large bowl. Stir in

cooked vegetables, potatoes, matzo meal, dill, salt and pepper. Beat egg whites in separate large bowl until stiff peaks form. Fold 1/3 egg whites into vegetable mixture; gently fold in remaining egg whites. Turn mixture into well-greased 1-1/2 quart soufflé or baking dish. Bake at 400° for 30 to 35 minutes or until kugel is puffed and golden brown. Makes 4 servings

Sweetened Naturally With Honey
National Honey Board

Zucchini, by itself, does not freeze well. It tends to go all limp and watery. And, in fact, some dishes made with zucchini and frozen are never quite as nice when thawed and heated. However, breads and cakes freeze quite well with zucchini as an ingredient. So make some of the baked goods during zucchini season and freeze them for those winter months when you want something special from the freezer.

ANISE ZUCCHINI CAKE

An excellent cake to make in a large batch and freeze. Instead of vanilla flavoring, try lemon, almond or anise for variety.

1 cup milk (can be low-fat)
1/2 cup oil
1 cup honey
1 tablespoon vanilla
2 cups grated zucchini
3 cups whole wheat flour
1/2 teaspoon salt
1/2 teaspoon baking powder
1 tablespoon anise seeds
1/2 cup chopped walnuts
1/2 cup raisins (optional)

In a large bowl mix together the milk, oil and honey, using a wire whisk to blend thoroughly. Next, add the vanilla and zucchini. In another bowl combine the remaining ingredients and add them to the honey and oil mixture. Spoon into an oiled 8x8 inch baking pan and bake at 350° for 40 minutes.

Honey & Spice
Lorena Laforest Bass

SWEET ZUCCHINI BREAD

This next quick bread is wonderful plain or drizzled with some honey. It freezes well.

1 egg
1/2 cup honey
1/3 cup melted sweet butter OR oil OR a mixture
1 teaspoon vanilla
1-1/2 cups grated or shredded zucchini, skin and all
1/2 cup golden raisins
1/2 cup chopped nuts
1-1/2 cups unbleached white flour
2 teaspoons baking powder
1/2 teaspoon salt
1-1/2 teaspoons cinnamon

In a mixing bowl beat the egg until it is light and thick. Add the honey, butter or oil and vanilla and beat well to blend. Stir in the zucchini, then the raisins and nuts and mix. Sift together the flour, baking powder, salt and cinnamon. Add the flour mixture to the liquids and fold in with a rubber spatula, mixing lightly until the flour is just absorbed. Pour the batter into a greased, medium to large loaf pan. Bake at 350° about 45 to 50 minutes or until the top feels springy to the touch. Let the bread sit in its pan for about 10 minutes before removing to cool on a rack. Makes one loaf.

The Garden Way Bread Book
Ellen Foscue Johnson

CHOCOLATE HONEY ZUCCHINI CAKE

This next recipe won a blue ribbon in a Maryland honey cookery show. It makes a nice big cake and it freezes well.

2-1/2 cups flour
1/2 cup cocoa
2-1/2 teaspoons baking soda
1/2 teaspoon salt
1 teaspoon cinnamon
3/4 cup butter or margarine
1-1/2 cups honey
3 eggs
2 teaspoons vanilla
2 cups grated, unpeeled zucchini

Sift together the dry ingredients and set aside. Cream the butter and slowly add the honey. Add eggs to creamed mixture, beating until well blended. Add the dry ingredients and vanilla. Mix well. Fold the zucchini into the mixture. Pour into 12-cup greased and floured bundt pan. Bake at 350° for 50-60 minutes. Let cool 20 minutes before removing from pan.

More Honey Recipes From MD Kitchens
MD State Beekeepers Association

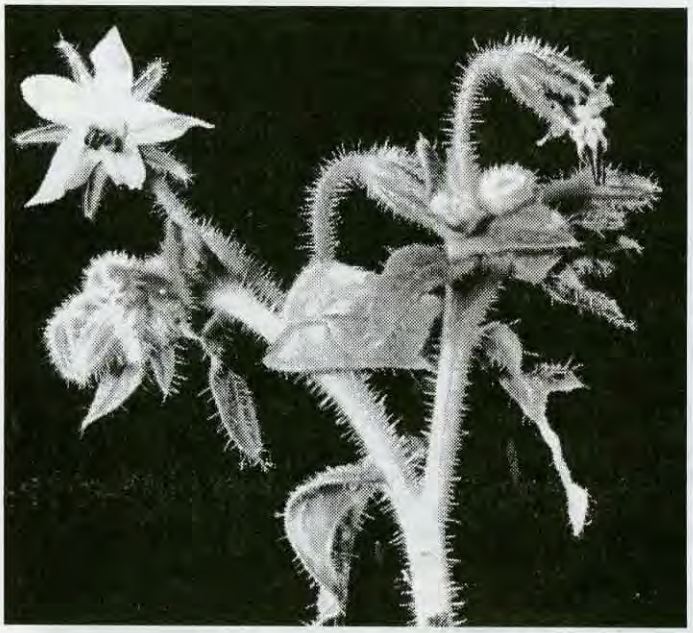
There! Do you have enough recipes to take care of all your zucchini? Probably not.

This Month's Honey Plant

B·O·R·A·G·E

B.A. Stringer

Borage, *Borago officinalis,* was once called the herb of gladness and bee bread. It has been noted as a favorite of honey bees, which seem to work the blue blossoms fervently, collecting the copious nectar and grey-white pollen throughout the Summer-long bloom. Nodding, sky-blue flowers protect the nectar from dew and rain and are very attractive to honey bees. However, it would be difficult to obtain pure Borage honey because there is rarely the density of flowers for bees to work. Besides, there are conflicting descriptions of the desirability of such honey.



In 1878, Mr. Fisk Bangs wrote to the *American Bee Journal* that "The period of blooming is from June 20 to cold weather. Where there are no plants for bees to work upon, Borage does very well; but when white clover and basswood are in bloom, bees will forsake the Borage for them. As cold weather begins to come, they swarm to the Borage. It is a good honey plant when there are no plants of greater importance in bloom."

The activity of bees upon the plants was noted by Mr. E.R. Root, editor of the 1901 *ABC and XYZ of Beekeeping,* who stated, "In 1879 I had a half-acre of it. It was moderately covered with bees for many weeks, but was much inferior to the Simpson honey plant" (Figwort, *Scrophularia marilandica*). He also commented that he had raised Borage in his garden and that some seasons saw the bees very busy on it.

A later report, in 1908, from Germany was less complimentary. "Herr Wilhelm says in response to the general cry, 'Sow Borage,' that he has been sowing it for years and now has it in abundance. How the bees do hum upon it! But, alas! Now that he has it in such abundance that it shows its character in the surplus honey, he finds it such as no customer wants, and says it is as black as a certain 'gentleman' with whom beekeepers do not generally care to have dealings. The task of getting it now rooted out is a difficult one."

However, by 1919, the *ABC and XYZ of Bee Culture* touts Borage honey as being "excellent." So Borage may be a favorite with honey bees, and they may visit the flowers constantly, as noted by Lovell in 1926 in *Honey Plants of North America,* but the value of the surplus honey is debatable. Let us recognize the value of the nectar and pollen to the hive though, and understand that Borage is probably not growing locally in sufficient quantity to affect your honey crop.

Borage, native to Europe and North Africa, has been grown in Britain for centuries, where its cucumber-flavored flowers and leaves have been used as ingredients for several beverages, particularly claret cup. As early as the 13th century, writings mention Borage being used as a salad herb. The rough, hairy leaves are sometimes added to pea and bean soups and stews, or cooked with cabbage to improve its flavor. In olden times, Borage cordials were prescribed for prolonged illnesses such as consumption, swooning and palpitations of the heart. Flowers have been candied and used for garnish. More recently, ingestion of the leaves has been discouraged because of components that may cause liver damage.

The botanical name for Borage, *Borago officinalis,* is probably derived from the Latin *burra,* a hairy garment referring to the coarse, hairy leaves. The plant grows well and easily in most soils, flowering from mid-Summer to frost. It will reseed prolifically in the garden and has been considered a useful plant for tapping into lower soil layers and extracting nutrients by way of the long, fleshy taproot. Once sown, forever grown – perhaps this may be a worry to the weeder, but it will always be a banquet for the bees. BC

B.A. Stringer grows bees, and bee plants near her home in Blodgett, Oregon.

?Do You Know? Answers

1. **True** In both queen supersedure and preparations for swarming, queen cells are produced. Both processes are initiated by a diminished supply of queen substance (pheromone produced by the queen and distributed within the worker population). In both cases, the old queen is replaced by a new queen raised during the process. In swarming the old queen normally leaves with the primary swarm and a new queen emerges to head up the original colony. In supersedure, the old queen either dies or is killed soon after the new queen goes on her mating flight and begins to lay eggs.
2. **True** Cannibalism by worker honey bees is one mechanism by which colonies control the number of drones produced. Even though normal colonies consume both worker and drone brood throughout the season, significantly more drone brood is eaten. As a result, drone production is often used as an indicator of the nutritional condition of a colony.
3. **True** Drone comb construction and brood production are related to the amount of drone comb and brood already present. Removing drone brood from colonies encourages its production and adding drone brood to colonies diminishes its production.
4. **True** Most swarming takes place in mid-spring, usually sometime in May or early June in the north. In the south swarming occurs earlier but it would still be considered within the mid-spring time-frame. A small secondary peak in swarming occurs in most areas in August and early September.
5. **True** During the spring and summer months drones begin to take orientation flights when they are about eight days old, while still sexually immature. These orientation flights normally take place in the afternoon, most often between 2:00 and 4:00 P.M. and last only a few minutes. Drones become sexually mature when they are approximately 12 days old.
6. **True** Drone mating flights generally take place in the afternoon, most often between 2:00 and 4:00 P.M., although the timing of drone flights can be shifted according to daily weather patterns. During sunny weather drones take several flights a day, averaging three to five flights an afternoon.
7. **False** Drones do not visit flowers to replenish their energy supply while they are away from the hive. They average three to five flights an afternoon and return to the hive for about 15 minutes between flights to consume additional honey for energy.
8. **True** Swarming is a form of reproduction at the colony level. Numbers are increased by splitting the population and producing a new queen, thus doubling their chance of survival. The queen is provided assistance from the workers that accompany her in building the new nest, starting brood rearing and foraging.
9. **False** Scout bees use the wag-tail or waggle dance on the surface of the swarm cluster to indicate the location (direction/distance) of a potential new home-site, so other bees may check on its suitability.
10. A) Amount and pattern of brood
11. C) four
12. D) four
13. A) three
14. To mate with virgin queens
15. Beekeepers cutting out queen cells prior to swarming delays the issuing of the first swarm for a few days but does not stop the colony from swarming.
16. Afterswarms in comparison to primary swarms are smaller in size and are accompanied by one or more virgin queens rather than the old queen.
17.

Supersedure	Swarming
Produce 1-6 queen cells.	Produce 4-20 queen cells
May occur at any time of the year.	Is seasonal.
Queen cells are near the lower center of the broodnest.	Queen cells are built near the bottom of the broodnest.
Colonies may be strong but they are more likely to be weak.	Colonies are normally strong and populous.

18. Egg laying
    Pheromone production

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

Richard Taylor

Bee Talk

"To some people nature just glows with beauty, while to others it is just a vast thing."

"Love never fails." That, I am told, comes from St. Paul the Apostle. Machiavelli, who thought he had a better understanding of the world, changed that to "fear never fails." I don't go in for Bible reading or churches, but a long life finally did teach me that St. Paul had it right. We are, as they say, too soon old, and too late smart.

And what has all that got to do with bees? This is, after all, a magazine devoted to beekeeping, not to devotional themes.

Well, I mentioned that maxim about love never failing to a luncheon companion the other day, and she expressed doubt. She thought it was too lofty, and didn't work very well in the real world. I undertook to prove to her that it is true, and found myself drawing from my experiences as a beekeeper. I'll get around to describing how I proved, or at least convincingly defended it, in just a moment; but first, I want to go back a few years.

Way back in the '50s, an elderly couple asked me to move a hive of bees into their yard to pollinate their fruit tree, and this I did. One day, as I was doing something with the bees, the lady, watching from a distance, was struck by my casualness. I was in shirtsleeves, no gloves, and the bees were not bothering me at all. She remarked, "You just send love out to them, don't you?" I had never thought about it that way, but yes, I guess that was a correct description. Sometimes I even talk to them. Does that make any sense? The bees don't have the remotest idea what I'm saying. They don't even hear me, and they certainly are not responding sympathetically to any feelings of compassion. But yes, it does make sense, because of what that way of going about things does to *me*. It puts me in just the right mood and frame of mind to be working with the bees. I get few stings, and when I do get one, I don't make much of it. But, far more important than that, approaching the bees, and indeed, nature in general, in a spirit of love, opens my eyes and my feelings and senses to what I would not otherwise be aware of at all. How you see things depends a lot on the state of your own heart and mind. To some people, nature just glows with beauty and wonder, while to others, it is just a vast thing. The difference is in the observers, and it is the first kind of person, I think, who sees things the way they are.

That, I suppose, is why I never requeen my colonies. I don't think I have ever requeened a colony, if that means finding the old queen, murdering her, and replacing her with another. It is just no way to treat an animal who has done so much for me, and besides, I would just find it repugnant, completely out of keeping with my love for bees. Some say that requeening reduces swarming, and also that you can get better honey production with new queens. I'm not so sure of either of these, and besides, it seems simpler just to have a few extra colonies, thus compensating for both problems, if indeed they are problems. If I can get 20 percent more honey by requeening every year, then I can get the same result just by having 20 percent more colonies. I am also spared the extra toil. Finding all the queens in an apiary can be a daunting task. And even good beekeepers can screw up trying to requeen. You go back and find a colony or two of laying workers, and then what have you accomplished? Last Spring I was visiting Mr. Dave Casdorph, out in Ohio, a beekeeper who has a whole roomful of beekeeping trophies and awards, and he told me that one of his queens, after six years, was still creating brood patterns as good as any in his apiary. He marks his queens, so he knew her age.

Getting back now to what St. Paul said about the power of love, and my luncheon discussion of this, I told my companion about my honey stand, operated, all these many years, on the honor system. I trust the people who stop there, and make this known to them with a little note tacked up near the cash box. This is, in a broad sense, an expression of love, and they respond accordingly. I have virtually no theft. Day after day, everything tallies out correctly. I left a pad of paper there, so people could do their arithmetic, and found, instead, that they wrote me notes of affection – hundreds of them. I began pinning these notes up inside the stand. Sometimes they even add to what they owe me. One patron added an extra $5 last Summer. These people are, with few exceptions, strangers to me. I never even see them, unless I happen to be down there when they drive in. Now consider, what would happen if, instead of treating all these people with trust and affection, I were to post signs to the effect that thieves would be prosecuted "to the full extent of the law," etc.?

Maybe the word "never" is, strictly speaking, too strong, in St. Paul's epigram. There really are some bad things in nature, and in people. But certainly Machiavelli had it all wrong. The hyperbole is not out of place: Love never fails. BC

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

Questions?

Stop The Queen

Q Are there ways to get the queen to slow down egg laying in the Fall? Does feeding sugar syrup in the Fall stimulate egg laying?

Charles Walli
Marengo, IL

A It is known that the queens of some races of bees are less prolific in the Fall than others, but I do not know which races have this trait. I do not myself consider it very important, as there are advantages to going into Winter with very populous colonies. With a single-story hive, if the combs are pretty much filled with honey, so that there is little space for egg laying, then the queen will of course slow down. This condition produces a swarm in Springtime, but rarely in the Fall. As for sugar feeding: Yes, this is always a stimulus to egg laying if the weather is reasonably warm.

Old Equipment - Safe?

Q I was given some hives and equipment that have not been in use for two years. Is it safe to use this equipment?

Mitchell Drinnon
Sneedville, TN

A The only danger associated with used equipment is that it can transmit American foulbrood. It cannot transmit mites. Unless you have reason to think that the bees that were in this equipment had AFB, you are probably safe in using it. If you are unsure, then start by using just one of the supers to minimize risk.

No Queen

Q Last Fall I started a new colony with a purchased queen. The bees built up well, but in the Spring there was no worker brood, only a few patches of drone brood. So I killed the drone-laying queen, switched the hive with the strong colony next to it, and gave this queenless colony two combs of brood with eggs and larvae. A week later the colony had five capped queen cells. I then started a five-frame nuc, using one of the combs from the colony that had one good capped queen cell, and fed this nuc honey from a top feeder. About two weeks later I found that the queen cell was gone, but the bees had made five new queen cells. How come?

Loren Davis
Decatur, AR

A Bees behave mysteriously sometimes, especially in their acceptance, rejection, or supercedure of queens. There is no way of knowing exactly what happened, but the bees in the nuc evidently rejected the ripe queen cell you gave them and chose to raise a new one. Since you were feeding the nuc honey, it is possible that another colony was robbing from the feeder – perhaps the colony from which you made up the nuc – and this could have resulted in the destruction of the ripe queen cells, or the newly emerged virgin queen.

Any Good Books?

Q Where can I get comprehensive information on honey plants? Are there any books that would tell me what perennials to plant?

Sue Drinsinger
Granton, WI

A Two comprehensive books on honey plants are *Honey Plants Of North America,* by John H. Lovell, and *American Honey Plants*, by Frank C. Pellett. Both are now out of print but may be available through libraries. Booklets on honey plants can be obtained through the Brushy Mountain Bee Farm, Moravian Falls, NC 28656

No Results!

Q There are a couple of acres of purple loosestrife near here, and I put three hives near it when it bloomed late last Summer, but with no result. Can you explain this?

Robert C. Stott
New Castle, WA

A Some plants require very special conditions of soil, etc., to yield nectar, and all require lots of sun, although I would expect this plant to be a good nectar source anywhere it grows, since it thrives mostly in moist soil. Sometimes a colony will not exploit a good nectar source unless it is moved there well in advance of the bloom – perhaps at least a week or two. And very often there just seems to be no explanationfor why bees do not forage on what appears to be a bountiful source.

Not For Babies

Q It is my understanding that honey should not be used as an infant food because it could seriously affect babies' digestive systems and their ability to fight bacteria. Why, then, do honey labels not provide such a warning?

Rev. Harold J. Goldzung, Sr.
Waupun, WI

A The advice, not to give honey to children under age two, is sometimes seen in the offices of pediatricians. I believe the basis for this is that botulism spores, in small numbers, have been found in honey, and it was believed that the digestive system of a baby might thus be vulnerable to botulism. No one has ever suggested that honey poses any such danger to older children or adults. I believe that no actual case of botulism in any infant has ever been traced to honey, and the danger is probably more imaginary than real. In any case, the danger, if it exists at all, is certainly not such as to warrant a warning label.

Continued on Next Page

Answers!

Richard Taylor

Foulbrood Questions

Q Last Summer my apiary was plagued by foulbrood which I did not detect until the bees were reduced to a very weakened state by Fall. Now I have nine dead hives heavy with honey. Questions: (1) Do I need to burn the frames and sterilize the hive bodies, or can I just install package bees and treat for foulbrood? (2) If I then find early signs of foulbrood in the middle of a honey flow, do I need to remove the supers and begin treatment immediately? And, (3) is a colony with only moderate infection past recovery? For example, if I treat for foulbrood in July, can the bees recover in time for Winter?

Henry Yoder
Wallingford, KY

A 1. A hive contaminated with foulbrood must be sterilized by scorching the inside, and the combs burned, for otherwise a package installed in that equipment will almost certainly pick it up; 2. Yes, honey supers should be removed from any hive having American foulbrood and the colony either destroyed or treated. The honey in the supers is okay, and the supers can be put on another colony without serious risk, contrary to widespread belief; and 3. it is probably foolish to try to cure American foulbrood, saving the equipment. What you can do is shake the bees out into a clean hive with foundation, treat them with terra, and build the colony up with sugar syrup, meanwhile destroying the infected combs; but it is doubtful whether it would be worth it.

Short Swarms

Q I have two hives. One of them swarmed in August, and then, after about 20 minutes, the bees all returned to the hive. About a week later the other hive did the same thing. What is the explanation for that?

Merrell Johnson
Lake Nebagemon, WI

A It is very uncommon for bees to swarm in August, and certainly not typical for them to cluster and then return to the hive. Sometimes a swarm will leave when a virgin queen leaves on her mating flight, and then returns to the hive, but it is very unlikely that two colonies would do this at about the same time.

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

CORRECTION

In the July issue of *Bee Culture*, we accidentally omitted some words from Richard Taylor's Bee Talk. In reference to his friend placing a classified ad for help with his bees, Richard's comment should have read "I was reminded of how, a few years ago, at a very dark point in my life, I inserted in this magazine what I thought was a thinly disguised ad for a wife, and was deluged with responses, all of them from men."

Our apologies to Mr. Taylor.

Gleanings

AUGUST, 1997 • ALL THE NEWS THAT FITS

No First Amendment Violation
SUPREME COURT UPHOLDS MARKET ORDERS

Agriculture Secretary Dan Glickman applauded the U.S. Supreme Court's decision upholding the constitutionality of mandatory assessments for generic commodity promotion programs.

"The court's decision in the case *Glickman v. Wileman Bros. And Elliott, Inc.,* validated marketing order and other USDA promotion programs as currently established and administered," Glickman said.

"These generic commodity promotion programs have been a mainstay for the agriculture industry and consumers for more than half a century," he said. "They are requested, administered and paid for by the industries that use them. The fact that these industries continue to vote overwhelmingly in support of existing programs or starting up new ones is a clear indication that they find them to be beneficial.

"As the majority of producers have found, product promotion tools increase sales, both at home and in international markets. These self-help programs are vital to agriculture's economic health, and they strengthen America's trade balance," Glickman said.

Wileman sought the court's review of the First Amendment issues raised in generic advertising programs under marketing orders for CA nectarines and peaches.

Respondents, CA tree fruit growers, handlers, and processors, initiated administrative proceedings challenging the validity of various regulations contained in marketing orders promulgated by the Secretary of Agriculture under the Agricultural Marketing Agreement Act of 1937 (AMAA). Congress enacted the AMAA to establish and maintain orderly agricultural commodity marketing conditions and fair prices; the program, which is expressly exempted from the antitrust laws, displaces competition in favor of collective action in the discrete markets regulated. AMAA marketing orders set uniform prices, product standards, and other conditions for all producers in a particular market; must be approved by two thirds of the affected producers; are implemented by committees of producers appointed by the Secretary; and impose assessments on producers for the expenses of their administration, including product advertising and promotion. The orders at issue assessed respondents for, *inter alia,* the cost of generic advertising of CA nectarines, plums, and peaches. After the Agriculture Dept. upheld the generic advertising regulations, respondents sought review in this action, which was consolidated with enforcement actions brought by the Secretary. The District Court upheld the orders and entered judgment for the Secretary, but the Ninth Circuit held that the government enforced contributions to pay for generic advertising violated respondents' commercial speech rights under the test set forth in *Central Hudson Gas & Elec. Corp. v. Public Serv. Comm'n of NY,* 447 U.S. 557, 566.

Held: The requirement that respondents finance generic advertising does not violate the *First Amendment.* Pp. 8-19.

Website To Supply
FEDERAL REGULATIONS AVAILABLE

The public will soon have access to summaries of all state and federal environmental regulations affecting agriculture, an official with the National Association of State Departments of Agriculture (NASDA) announced today.

"Whether you're an agricultural producer or an attorney, you'll be able to identify the regulations that will affect production agriculture in that state," mark C. Nestlen, NASDA's director of legislative and regulatory affairs, said at a workshop for Farm*A*Syst, a natural resources assessment and management program. The workshop was held in conjunction with the first ever National Resource Management Planning Conference. The conference is co-sponsored by NASDA Research Foundation, the Conservation Technology Information Center (CTIC), Monsanto Agricultural Group, Farmland Industries, Zeneca Agricultural Products, DowElanco, the National Pork Producers Council, the USDA's Natural Resources Conservation Service (NRCS) and the U.S. Environmental Protection Agency (EPA).

Nestlen said the first 30 state summaries developed by NASDA in cooperation with the National Center for Agricultural Law and Research information at the University of Arkansas should be available by early September. The data will be accessible through NASD's Internet web site. "These summaries will provide guidance to landowners as they develop comprehensive plans to protect and preserve their natural resources on their entire farm or ranch," Nestlen said.

Approaching resource protection through voluntary total resource management planning is a key feature of the 1996 Farm Bill. Nestlen said the concept grew from a 1994 recommendation of commissioners, secretaries and directors of state departments of agriculture who were looking for ways to increase availability and flexibility of small conservation and water quality protection programs administered by the USDA. Ron Lauster, national conservation planning leader for the NRCS, added the change in the 1996 Farm Bill encourages farmers and ranchers to make resource management a continuous process.

"Resource planning is to environmental stability as financial planning is to economic stability," Lauster said.

While the Farm Bill embraces voluntary resource management planning, Nestlen noted the $16 billion the bill allocates over seven years falls far short of the financial assistance farmers will need to implement resource protection projects. He said additional assistance may become available from the EPA under the Clean Water Act and the Safe Drinking Water Act.

CTIC is a nonprofit information/data transfer center that promotes environmentally and economically beneficial natural resource systems. NASDA is a nonprofit association of public officials representing the Commissioners, Secretaries and Directors of Agriculture in the 50 states and four territories.

ALMOND BLOOM & HARVEST DATE

There have been many questions asked concerning the possible harvest date for the 1997 almond crop due to the early bloom. The chart below lists the Nonpareil bloom at one percent in Kern County, California for the years 1986 through 1997 (where available), and the corresponding date of the first crop receipts. As you can see, the bloom dates have varied as much as 25 days, but the first day of crop receipts has only varied nine days. It seems that the weather during June and July is more of a determining factor on when harvest starts than the actual bloom period. Late blooms can produce early crops, as in 1987, and early blooms can produce "normal" harvest dates, as in 1995.

YEAR	NONPAREIL BLOOM AT 1%	1ST DAY OF RECEIPTS
1986	Feb. 3	Aug. 4
1987	Feb. 19	Aug. 5
1988	Feb. 16	Aug. 10
1989	Feb. 24	–
1990	–	Aug. 9
1991	Feb. 13	Aug. 9
1992	–	Aug. 3
1993	Feb. 14	Aug. 12
1994	Feb. 19	Aug. 10
1995	Feb. 1	Aug. 6
1996	Feb. 13	Aug. 6
1997	Jan. 30	?

ALMOND FORCASTS & HARVESTS

The objective almond forecast for the 1997-1998 crop year is 680 million meat pounds, according to the California Agricultural Statistics Service (CASS). This forecast is based on 420,000 bearing acres.

The official announcement was made today at the Modesto office of the Almond Board of California, which funds the forecast. Gary Nelson of CASS said the forecast is down four percent from May's subjective forecast and up 33 percent from last year's crop.

The Nonpareil variety is forecast at 333 million meat pounds, up 33 percent from last season. The Nonpareil variety represents approximately 49 percent of total California almond production.

"Statewide bloom reports were excellent with a warm and mild Spring. The crop is one to two weeks ahead of normal," said Nelson.

The average nut set per tree is 7,567 up 38 percent from 1996. The Nonpareil average nut set of 7,714 represents a 55 percent increase from last year's set. The average kernel weight for all varieties sampled was 1.59 grams, down 14 percent from last year. A total of 97.9 percent of the nuts sized were sound.

The sampling, conducted between May 23 and June 17, involved 1,774 trees surveyed in 887 orchards.

CASS Almond Crop Estimates vs. Actual Receipts

Crop Year	Subjective Forecast	Objective Forecast	Final
1991-1992	450	460	486
1992-1993	570	550	546
1993-1994	520	470	489
1994-1995	610	640	733
1995-1996	430	310	367
1996-1997	520	530	507 to date
1997-1998	710	680	TBD

Further information about the methodology used in making the forecast can be obtained by contacting the Almond Board at (209) 549-8262.

HONEY BOARD NEWS

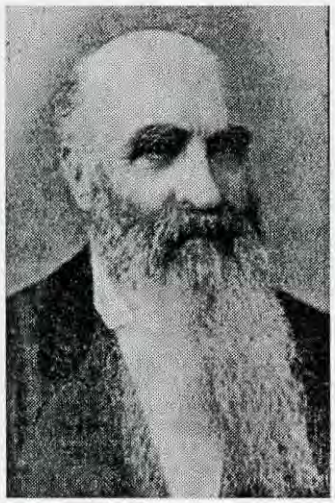
Out of the Hive and Onto the Web Looking for overseas market information? The Foreign Market Research section of the Foreign Agricultural Service's Web site (www.fas.usda.gov) allows users to download market research reports. (After accessing the "Foreign market Research" section, click on "Attache Reports" to search for reports by country.) These reports are written by FAS representatives in overseas offices and offer detailed market information.

Honey-Inspired Drinks Just In Time For Summer With Summer in full bloom, the Honey Board recently sent two sets of cool honey recipes, along with photographs, to newspaper food editors across the country. One set focused on the growing popularity of honey teas (Honey Raspberry Tea and Honey Mint Iced Tea) and honey-flavored coffee drinks (Frosty Honey latte); the second recipe set focused on the trend toward fruit smoothies (Ginger peach Smoothies) and juice drinks (Tropical Juice Quencher). All of these refreshing coolers, sweetened naturally with honey, are perfect for long, hot Summer days. For recipes, call Jami Yanoski at 1-800-553-7162, or watch for these recipes to appear in your local newspaper's food pages.

Honey's All the Buzz on TV The Honey Board secured a three-minute segment about honey for the national television show "Cooking with Burt Wolf." Filmed April 29 in San Antonio, Texas, the segment featured "Avocado Pico de Gallo" with avocado honey and "Honey Flan" with orange blossom honey. While preparing the recipes on air, Wolf discussed pollination, honey varieties and storage suggestions. In other television news, the Honey Board sent honey and beekeeping material to nine network and syndicated children's television shows, including "Barney and Friends" and "Sesame Street."

Display Index

Charles Dadant was born in a village of the old province of Champagne (now department of Haute Marne), France, May 22, 1817. When a young man he was a traveling agent for a dry-goods firm, and afterward became a wholesale dry-goods merchant himself, subsequently leaving this business to associate himself with his father-in-law in the management of a tannery. In 1863 he came to the United States, intending to make a business of grape-growing, with which business he had been familiar from childhood, as it was the leading business of his native place. He did not know a word of English at this time; but by the aid of a dictionary he became acquainted with it, so that, four years later, he could write articles for the papers, but he never learned to pronounce English correctly.



Charles Dadant

In 1864, a love for bees, which had shown itself in childhood, asserted itself anew, and he obtained two hives of bees, from a friend. After trying movable-frame hives side by side with the old European "eke" horizontally divided hives, the latter were cast aside, and in 1868 he tried to get the French apiarists to try the Langstroth system, but was rebuked by M. Hamet, the editor of a French bee-journal, who has never ceased trying to fight against the invading progress of movable frames, although other bee-magazines have started in France which have done the work he might so well have done. About this time Mr. D. tried to import bees from Italy. In 1873 he went in person to Italy, but was not entirely successful till 1874, when he succeeded in importing 250 queens. These importations were kept up for years. In 1871 he started an out-apiary, and steadily increased the number of his colonies from year to year. In 1874 he took into partnership his son, Camille P. Dadant, then 23 years old, who had been raised in the business. Since 1876 they have kept five apiaries of 60 to 120 colonies each. They have built up a large trade in extracted honey – the product of their bees in 1884 having been 36,000 lbs. Messrs. Dadant & Son are among the largest, if not the largest, manufacturers of comb foundation in the world. Commencing with 500 lbs. in 1878, they reached in 1884 the enormous amount of 59,000 lbs. Both father and son have written no little for the American press. Mr. C. Dadant is better known as a writer for European publications, and has been one of the main expounders of American methods in Europe; and the Langstroth-Quinby-Dadant hive, introduced by him into the Old World, is largely used under the name of the Dadant hive. He published a *Petit Cours d'Apiculture Pratique* in 1874, in France. To him was committed the task of preparing a revised edition of Langstroth's book, and this he has also translated for publication in the French language. The English edition contains 520 pages, and has been fully brought up to the time.

- From ABC of Bee Culture, 1891

Camille Dadant