Bee Culture

OCTOBER 1995

INSIDE

Octo

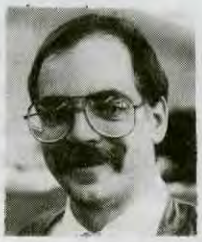
COLUMNS

ovary superior

DEPARTMENTS

Books, Pg. 552

JOHN ROOT
Publisher



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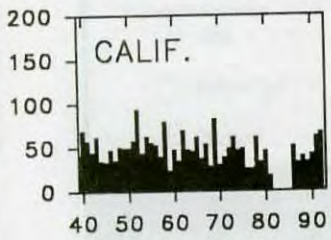
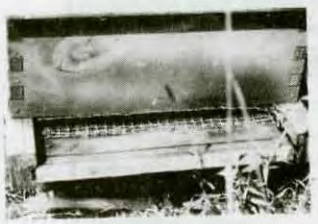


Honey Production, Pg. 562

FEATURES



Fall Prep, Pg. 577

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Cover
It takes bees, lots of bees to make honey. This month Roger Morse looks at exactly how they do that. And, Eric Erickson looks at where, and how they collect the raw materials.

Photo by Warren Black & Gordon Langlie

Apistan, Pg. 590

INNER COVER

Seasonal Change

What marks the passing of the seasons? It is an old question, often posed by those who are either unsure, or wish to make others aware of nature's subtle changes as she, and we, ride this globe through the heavens.

Twice per year, an event occurs here that coincides with the change from something, to something else. It goes like this.

When I leave home on my way to work I head down a road that runs more or less east for about a mile. Both sides are walled by trees for the first hundred yards, so for the first few minutes I'm looking down a tunnelled trail toward the eastern horizon.

For about a week in September, and another in March, the sun sits delicately and directly on the center line of the road at the time I leave. The rest of the world is still early-morning gray, and the trees are shadow black, so looking into the violent reddish-yellow horizon is as dramatic as it is dangerous.

Since this brilliant ball rests directly on the pavement the visor is useless, and because of the intensity sunglasses are of little help. The first hundred yards of my daily drive are too often negotiated from memory rather than my usual defensive driving diligence. I admit I've been lucky.

When I first moved here this aggravation was more important, and more noticeable, than other things going on around me. After all, nearly dying every morning for a week can command much of your attention. Or so I thought anyway.

But after awhile I got used to this, and, actually, began to notice the other things going on around me – after nearly a decade some things finally sink in. One of these was that before those sunlit September mornings the world pretty much felt like summer. And before the March event it was pretty much winter.

And after the sun had moved, had continued its trek and was no longer an obstacle in the morning, the seasons changed. Crossing that road one way from south to north, leaves the world behind cold and gray. Going the other brings warm and green.

What better way to mark the passing of the seasons? No calender needed, nothing artificial or man-made, at least no more than the sun guides of the Southwest Indians, or the stones of Stonehenge. But twice a year the sun appears at a predetermined spot that commands my complete and undivided attention, and the seasons change.

Kim Flottum

KEEP IN TOUCH

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MAILBOX

Skunk Remedies

I was reading May's *Bee Culture* on Skunk Solutions. It was fine but sometimes it seems to me the hobbyist beekeeper found the March 'skunks' amusing. However the author's solution was costly and complicated.

I think my solution is cheaper yet more versatile and longer lasting.

I use concrete 8" block three high. It takes a total of six blocks. I like 12" blocks because in our area of TN we find level land in short supply and a 12" block laid flat gives us a broader base. I was using only one 8" block as it saved my back I figured, but increased the need for skunk protection and more mowing. I also trap pollen and in one yard a mother skunk was emptying about half of my pollen traps to feed her family to the tune of $15-$20 worth of pollen every few days. I didn't feel like donating that much to ecology and having a whole family next year so I set a leg trap and next time I gathered pollen I had a dead mother skunk and I saw a young one scamper away. A reset trap took care of that.

I also had trouble from 'possums helping themselves to my good pollen and remedied that the same way.

I remedied the lifting problem almost entirely by stacking all cull hive bodies on top of each other until I get it the height I need to swing the supers and hive bodies over on top of them and not have to lift them off of the ground. Us older beekeepers usually have a lot of this kind of stuff around. So I set a half a dozen or so at each beeyard and a few old supers too. This way you can pretty well fine tune your moveable hive stand to the height you need for each hive.

I don't equalize my hives and anyway some queens need more egg laying room and I give it to them.

My best hive now and incidentally a single queen hive has three hive bodies and six medium deeps. I added a 7th just in case.

Oh you can use your old hive covers or bottom boards on top of a hive body or two to stand on to get everything back together. A few of them make life interesting but 150 would have your tail dragging.

Oh the average production around here is 30# to 40# per hive. Two years ago I had 70# and last year only 30# thanks to the mites.

I am not a hobbyist and I am not a commercial beekeeper. I am an in-betweener like the boy who is too old to cry and too young to cuss.

Wood rots and takes time to make. Cement blocks don't rot and are in a form ready to use. New 12" blocks at $1.00, seconds at 50¢, culls at 30¢. New 12" x 6 = $6.00; seconds @ 50¢ = $3.00; culls @ 30¢ = $1.80.

I'd like some feed back on my block idea, etc.

Jim Hagemeyer
5337 Hwy. 411
Madisonville, TN 37354

Editor's Note: Leg traps and even live traps have their friends, and foes, and legal restrictions. Check before you try these.

The easiest way to keep skunks from the front of a beehive – I use a piece of 6" wide by 16¼" long board and either drive nails through so that the points are sticking through about ¼" or use carpet tack strip and nail to the bottom of this 6" board and nail to the entrance to the beehive.

This must have been the year for bees to swarm. I got 10 swarms and hardly had to leave my place. I got four right here at my place in five days time and across the alley at my neighbor's flowering plum tree I got six. On the 11th of June I had to drive 10 blocks and got a swarm of 11 lbs. So for me there were three 11s in June – my 11th swarm on the 11th of June and it weighed 11 lbs.

Cecil Duffield
Evans, CO

Observation Hive Observations

The time was fast approaching when I would need to move a frame of sealed brood from my observation hive to my backyard one. (This would be the third one so moved this year.) The bees had eaten virtually all the pollen they had. Their only honey was in the frame with the brood so they would lose that, too; it would have to be replaced.

There was a frame about one quarter full of honey in the backyard hive I could swap for the brood but none with both honey and pollen. The obvious solution was to cover the top bar of the lower frame – it was empty – with a pollen patty. Then I got an idea. Why couldn't I remove this frame, shake off the bees and pour the empty cells on one side full of pollen pellets from my freezer? If I was careful to keep the frame vertical then most of the pellets should remain in place.

So I did just that. And after replacing the super frame, and putting the queen in with it, I reassembled the two story hive and moved it back inside my house and reconnected the entrance tube. Next I shook the bees from the brood frame onto a sheet thumbtacked under the entrance and installed that frame in the outside hive.

When I went inside to see how the bees had accepted the pollen arrangement, I got quite a shock. They were hurriedly kicking all the pellets out of the cells onto the floor of the hive. "So much for you, you smart aleck beekeeper!" But they didn't stop there. As soon as the cells were empty, they set right to

Continued on Next Page

MAILBOX

work, moving the pollen back into the cells. But not as the original pellets. Now they moved it almost as dust, packing it tightly into the cells. And, in so doing, they maintained the color separation as they do with pellets normally.

So here's the lesson they taught me: The next time I need to add pollen to the observation hive, just open it up and pour the pellets right down onto the floor. They will take it from there and do it their way. **A word of caution:** If the pellets remain in the bottom of the hive too long before the bees move them up into the comb, it is likely to mold. So insert it in the hive sparingly.

I caused my observation hive bees to kill their queen. Why did I do this? Because no one told me it could happen. How did I do it? I caused them to think she was a foreign queen trying to invade their hive.

The queen had remained in the upper 'super' exclusively for several brood cycles and I wanted her to lay in the lower one, too. (My hive provides 7/8" between the two frames rather than standard bee space and this might be the reason.) So I set out to move her down by taking the hive outside and lifting the upper frame out of the hive. After catching the queen in a queen grabber, I reassembled the hive, reinstalled it in the house and connected up the entrance tube. Then I released the queen at the outside entrance and she went right in. Then something went wrong. When I checked later, I found the queen on the ground outside dead. I theorize that the foraging bees which occupied the lower super might have been living in an environment low in queen pheromones, making a misidentification more likely.

It would have been so easy to have inserted her directly into the lower hive body and then the incoming bees would have found her already in the hive. So sad I had to learn this at her expense.

Dan Hendricks
Mercer Island, WA

Killing Package Bees

I am a beekeeper who buys package bees each spring and kills them off in the fall. I have been using Cynogas to kill them but now I cannot buy it any more. Do you have anything to replace Cynogas or any other suggestions on how to kill them without hurting the honey – as I leave honey in the brood boxes for package bees the following spring.

Clifford Eggen
Thief River Falls, MN

Editor's Note: There are no legal ways to kill bees in a hive using chemicals that may not contaminate brood or honey combs. One method may be to pull all the honey and let them starve. But this, too, is not a perfect method, because then there is a dead colony to clean up. There are no easy answers when it comes to killing a colony. Better, perhaps, is to overwinter several combined colonies. They will be strong in the spring, and you will still have honey for your packages.

MAILBOX

Apistan Confusion

I am a little confused about a product that is advertised in your magazine to kill *Varroa* mites. This product, APISTAN says in the ad that APISTAN doesn't contaminate honey, but on the product there is a warning label that says not to expose honey to this product as it may contaminate the honey.

I have enclosed copies of both the ad and the label, so that you can see for yourself the contradiction. Beekeepers need to know the facts about this product and not be mislead by the advertisement.

Someone who does not carefully read the warning label could inadvertently contaminate their honey and someone could get sick or worse.

I hope that you will please consider running an article about this or at least try to get some clarification from Zoecon Corporation, the company that makes APISTAN.

Euclid H. Hicks
Chattanooga, TN

Editor's Note: The label *clearly* states not to use this product when honey supers are on the hives. To do so is a violation of the label. Everyone who uses a pesticide *must* follow the label, whether spraying apples or alfalfa, or putting Apistan on a hive.

"Stung" Answers

I just love the new *Bee Culture* – keep up the good work.

Adding my two cents worth to Larry Krengel, K.G. Pipes and others who are asking how do you answer the proverbial "Do you ever get stung" question.

I gave lectures on bees and beekeeping for many years in the Chicago area before I retired. I spoke at schools, clubs, social organizations and church groups among others.

The cardinal rule especially when speaking to young children is "Always Be Truthful!" Kids can spot a fib a mile away. Don't try to pretend that you have never been stung, they won't believe you.

Explain that yes, the beekeeper gets a sting or two now and then, but if he knows his job and does it right it doesn't happen very often. We make slow and deliberate motions, no banging of hives and we always wear protective clothing. (Demonstrate the clothing by putting on your bee suit, veil and gloves if you can – it's very impressive.)

Also explain that after a time we get an immunity to stings and they don't hurt very much any more, usually an itching sensation.

I always used to say that in any field of endeavor there is a down side. If you work with horses, they can step on your foot, cats scratch, dogs bite sometimes and if you are a cook, you get burned occasionally. Also if a bee stings you, (it's protecting the hive), it soon goes away, but if people sting you – saying untrue things about you, being nasty and hurtful, borrowing things and not returning them, these stings last a lot longer. So kiddies – be kind to one another.

Finally regarding L. Edwin Rybak's article in August, one wonders whether he's got enough smarts to be a beekeeper; philately maybe?

First, he's putting beeswax and water in wax paper milk cartons in the microwave and is astounded that it explodes!

Then he's ironing his queen excluders and removing old beeswax off the kitchen floor! His wife must be a treasure.

Will somebody please take this guy to one side and introduce him to one of the basic tools of beekeeping – the solar wax melter? It will not only melt your wax while you are at work, but make your queen excluders like new and no beeswax on the kitchen floor!

Cyrus J. Hackenscmidt
Sebastian, FL

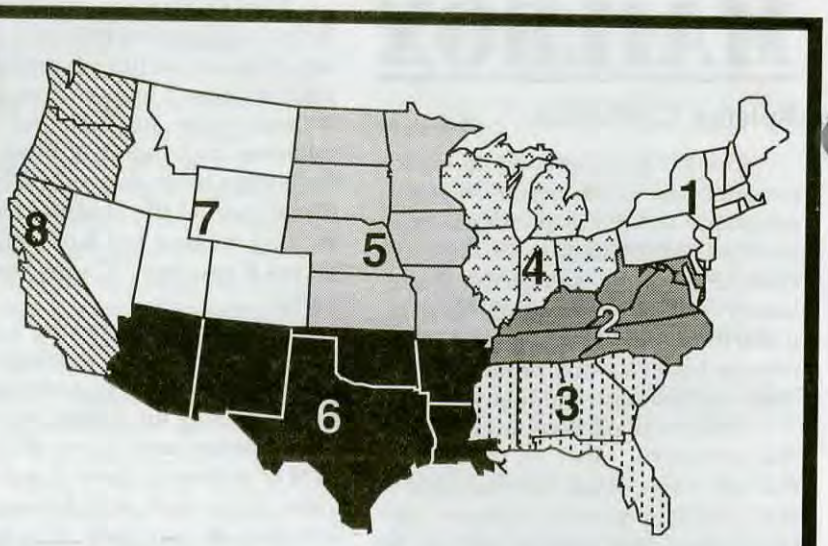
Editor's Note: Good advice, if you have time.

OCTOBER Honey Report

OCTOBER 1, 1995

REPORT FEATURES

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



	Reporting Regions								Summary		History	
	1	2	3	4	5	6	7	8			Last	Last
Extracted honey sold bulk to Packers or Processors									Range	Avg.	Month	Yr.
Wholesale Bulk												
60# Light	41.99	44.38	45.47	40.20	36.60	42.75	42.00	43.00	36.00-56.00	44.41	40.62	46.45
60# Amber	40.17	46.00	42.82	38.40	36.00	38.55	40.00	40.50	33.00-53.00	42.47	37.82	42.82
55 gal. Light	0.59	0.65	0.67	0.69	0.61	0.58	0.55	0.60	0.50-0.90	0.62	0.58	0.60
55 gal. Amber	0.54	0.55	0.60	0.67	0.60	0.53	0.50	0.53	0.45-0.78	0.57	0.53	0.56
Wholesale - Case Lots												
1/2# 24's	21.24	23.20	22.34	19.20	20.46	21.98	22.85	23.00	19.20-25.20	22.62	22.09	23.62
1# 24's	30.51	32.03	32.49	31.60	30.36	32.93	31.25	30.80	27.60-37.90	31.96	31.19	31.89
2# 12's	28.06	30.28	30.24	28.95	26.40	28.00	30.25	32.00	26.40-34.60	29.71	29.58	29.58
12 oz. Plas. 24's	26.95	29.63	29.37	26.40	24.60	26.23	27.50	25.70	21.60-38.40	28.11	27.92	27.68
5# 6's	28.43	32.13	28.51	31.95	24.45	27.88	29.20	31.20	18.00-36.95	30.59	29.75	31.32
Retail Honey Prices												
1/2#	1.42	1.88	2.00	1.09	1.20	1.77	1.18	1.22	0.99-2.25	1.48	1.38	1.49
12 oz. Plastic	1.60	1.81	2.00	1.69	1.45	1.68	1.70	1.50	1.19-2.05	1.69	1.59	1.67
1 lb. Glass	1.93	2.07	2.75	1.87	1.82	2.06	1.90	1.87	1.69-2.75	2.01	1.83	1.92
2 lb. Glass	3.08	3.32	3.75	2.94	2.99	3.09	3.15	3.31	2.69-4.00	3.24	3.24	3.17
3 lb. Glass	4.08	4.85	4.75	4.34	4.08	3.98	4.50	4.55	3.79-4.89	4.35	4.34	4.40
4 lb. Glass	4.92	4.90	5.75	5.41	6.36	5.36	5.25	5.41	4.50-6.36	5.36	5.48	5.34
5 lb. Glass	6.83	7.85	6.75	7.10	7.20	6.10	6.35	7.40	5.95-8.95	7.20	6.52	6.93
1# Cream	2.53	3.15	2.78	1.94	1.89	3.19	3.75	2.00	1.75-3.95	2.64	2.69	2.33
1# Comb	3.23	3.00	3.00	3.75	2.87	4.18	3.47	2.99	2.00-5.00	3.41	3.14	3.56
Round Plastic	2.96	2.75	3.38	3.38	3.00	4.01	3.38	2.50	1.99-5.00	3.15	3.02	3.40
Wax (Light)	1.71	1.39	1.78	1.65	1.48	1.76	1.45	1.63	1.25-3.50	1.73	1.98	1.63
Wax (Dark)	1.38	1.26	1.25	1.45	1.40	1.10	1.30	1.28	1.00-2.75	1.40	1.48	1.35
Poll. Fee/Col.	28.08	25.00	25.00	32.50	31.67	15.50	35.00	32.00	10.00-55.00	30.00	28.83	31.00

MARKET SHARE

The dust hasn't settled yet on what honey prices will be because of the restriction on Chinese honey imports. No country has yet rushed in to fill the void. Local honey, however, should do even better, since generic and brand names on store shelves are increasing prices, so should yours. Resist the urge to underprice just to move volume.

Region 1

Bulk prices still flucuating high and low, but the average seems a bit lower. Demand strong though as weather cools. Should be a good selling season. Colony conditions good to excellent inspite of dry weather. Late rains helped flow, and winter stores. Production/colony a bit above aberage due to late flows.

Region 2

Bulk prices climbing steadily as mainstream market forces take over specialty and farm market sources. Demand strong in the region with sales increasing. Colony conditions fine, weather dry, mites under control. Production/colony average to a bit above.

Region 3

Prices steady at wholesale, but rising sharply at retail level – a good sign wholesale will follow. Demand very strong and steadily increasing. Colony conditions only moderate – dry weather slowed/stopped production. Feeding in some spots. Mites slowing up.

Region 4

Wholesale prices only steady, but retail slowly inching up. Glass and delivery costs will add to increases. Colony conditions mixed as poor fall flow slowed everything down. Treated hives O.K., untreated generally heavily infested with mites. Could be a tough winter.

Region 5

Prices steady both wholesale and retail, but wholesale futures gaining strongly – $.70/lb. ela quoted from one source. Retail demand strong, but prices only steady. Colony condition generally strong, though production/colony lower than expected.

Region 6

Wholesale prices finally climbing a bit, retail steady. Demand steady, but expect normal increase as weather turns. Colony conditions fair to a bit weak as production/colony down and feeding requeened in many spots.

Region 7

Prices steady to down a bit, but this is probably due to the immediate flush of extracting. Demand strong and retail steady to increasing a bit. Colony conditions mixed as production down and bees stressed.

Region 8

Wholesale prices up a bit and retail up a bit more across the region. Influence of inexpensive imports deminishing, and retail trade slow. Colony conditions generally good and production/colony average to better – two years in a row!

Books & Videos . . .

Sell What You Sow. The Grower's Guide To Successful Produce Marketing. 1994 Eric Gibson. Soft Cover, 304 pgs. Illustrated. ISBN# 09632814-0-2. $25.00 (postage included). New World Publishing, 3085 Sheridan St., Placerville, CA 95667

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Profits From Your Backyard Herb Garden. 1995 Lee Sturdivant. Soft Cover. 120 pgs. Illustrated. ISBN #0962153538. $10.95 + $1.50 P&H. San Juan Naturals, P.O. Box 642P, Friday Harbor, WA 98250.

You may think that there is little connection between growing herbs and produce and keeping bees, but there is, and you should be aware of it.

Eric Gibson, in his introduction, says, "The sun sits on the horizon of American farming, and it is either sunset or daybreak, depending on whom you talk to, and whether they are following the old ways, or the new ways, of growing and selling." Things are no different for producing, and selling, honey.

Both of these books spend almost all of their time not on producing herbs or produce, but in selling herbs and produce. And, like producers of honey, they look for niche markets, have speciality crops, focus on 'locally produced, offer excellent customer service, need business plans, sales spiels and the like.

They also look at labels, packaging, complementary products, pricing, billing, delivery, advertising, starting a business, expanding a business and more and more and more.

If any of these sound familiar you begin to see why selling plants or produce is like selling honey. You can gain much from either of these books. Herbs tends toward the smaller producers, while Produce is more applicable for larger scale sellers. But either, or both will give you insights to selling your product that are at once familiar, yet come from just a different enough perspective that you'll learn something new – and sell more honey this year.

Kim Flottum

The Honey Bee. 1988, 1995. James L. Gould & Carol Grant Gould. Soft Cover. 250 pgs. Illustrated. ISBN #071676010X. $19.95 (available at most bookstores).

This is a soft cover reprint of the same book published in 1988, complete with photos, drawings and charts. This is not a book about beekeeping, but about bees. Much is dedicated to how bees learn, the dance language, foraging behavior, communication and honey bee intelligence.

The price has been reduced due to a paper cover, but nothing has been lost inside. Any serious student of the honey bee should have this book in the library. It won't make you a better beekeeper, but will help you understand your bees – which, I guess, will make you a better beekeeper.

Kim Flottum

Change From Within: People Make The Difference. 1995 Robert Reed and Howard Scott. GW Books, 2021 K Street, NW, Suite 211, Washington, DC 20006. $23.95 + P&H.

This is definitely *not* a book about beekeeping. It is, however, about running a business, something almost all of us are involved in, one way or another.

The blurb from the publisher says, "This book is not a procedural manual, but rather a collection of vignettes about change, choice, and customer involvement within Office Basics, a small organization struggling to survive in a competitive market place.

Though just a bit syrupy, it does a good job of watching a business go from management drive to customer driven, not a bad idea whether you sell paper clips, or honey.

One of the authors, though, is a beekeeper, and a regular contributor to these pages. Howard Scott, a hobby beekeeper from New England, adds much to our magazine, and now has added much to the business world. Perhaps we will need to pay him more, now that he's famous.

Kim Flottum

Beginning Beekeeping Video. 1 hr. 58 min. Ed Mabesoone Productions, P.O. Box 12352, Brooksville, FL 34601 $29.95 + $5.00 P&H.

Another beginning beekeeping video hits the market this month, one worth noting. Ed Mabesoone, producer, writer and on-camera person, puts together information he couldn't find when he was first starting, and did a pretty good job.

The almost 2 hours covers building equipment (boxes, frames and the like); colony inspection; checking for *Varroa* mites; diseases (using slides); industry resources; and finishes with a good extraction demo.

The strength of this tape over others I've seen (and I've seen most of them) is the detail in which most things are shown and explained. The use of each piece of equipment is explained and shown in use. The *Varroa* and nosema field tests are excellent, and even though slides are used, disease diagnosis is well explained and shown.

The strongest part of the tape is the emphasis on maintaining bee space, a concept few beginners understand – until they violate it. Construction is important, and the burr and brace comb that results when there's too much space is well demonstrated.

The only faults were personal, and minor. He didn't use glue on all the equipment, some pieces were constructed using fewer nails than I use. His equipment isn't commonly seen because he makes some of his own, but they are standard size, shape and construction. One other point worth mentioning is that he used smoke a bit sparingly perhaps, allowing lots of bees in the air during his hive inspection. Beginners may want a bit more control, but it could have been a 'shoot' situation. Like I said, minor points and not to detract from the overall content.

Beginning Beekeeping is easily worth the $34.95 total price, especially for a beginner, and definitely for a club helping out new members.

Kim Flottum

A Brief History Of Wisconsin's Beekeeping and Honey Producing Industry. 1995. Walter Gojmerac. $7.50 CALS Conference Office, 620 Babcock Dr., Madison, WI 53706.

The history of beekeeping in Wisconsin mirrors many states in development and growth. Though Wisconsin was a major honey producer for many years, it, too eventually suffered the cut backs and shutdowns most other states have seen in government attention to beekeeping.

Gojmerac does a good job of outlining this history, which is rich in well known names C.W. Aeppler, the Diehnelts, Adam Grim, G.B. Lewis and others.

Wisconsin was the first state to hire an Apiary Inspector, according to Gojmerac, to combat the terrible losses inflicted by American Foulbrood – a scourge then worse than the mites now. The state beekeeping industry also had a long and fruitful relationship with both the University system and the Federal Government. Names like C.L. Farrar and Floyd Moeller are well known.

But Gojmerac notes a dark side to these relationships, too. A recent historical overview of Wisconsin agriculture neglected to even mention beekeeping, and the loss of the USDA Bee Lab was the result of straight forward downsizing, greed, and lack of support when needed. Not an uncommon story, unfortunately.

The University still has an impressive collection of bee books, named after the original donor, C.C. Miller and that still shines in Wisconsin's history.

Though modest in size (and price) this book is a valuable addition to the library of any student of beekeeping history.

Kim Flottum

The Bee Book, Beekeeping in the warmer areas of Australia. 1995 Pete Warhurst & Roger Goebel. Soft Cover. 272 pgs. Color and B&W illustrations. ISBN: 0727-6273. Available from: Information Centre, Queensland Dept. of Primary Industries, GPO Box 46, Brisbane, BLD 4001. $48A., plus S&H.

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Queens' Land 1995 Norman V. Rice. Soft Cover. 132 pgs. Illustrated ISBN: 090790868-3. Available from Scout Bottom Farm, Mytholmroyd, Hebden Bridge, W. Yorks., HX7 5JS. Write for catalog.

The Bee Book is, as the title indicates, about beekeeping in Australia, but it's not that much different than in the U.S., and the basics are explained in an easy-to-understand way, with lots of good photos, both black and white and color. There are some differences however, and even an experienced professional will pick up an idea or two here, though it is a book more for beginners than commercial operators. But some differences are unique to the country, and are enlightening in themselves. For instance, repellants aren't legal to harvest honey, the native honey plants, some pests and diseases and stingless beekeeping.

Some things are explained in this book I've never seen elsewhere, too. Like how to deal with a colony that's been flooded, wasp predation, free flying harvesting, cleaner boards and more.

Plus, they deal with some aspects of tropical or near tropical beekeeping that can help if you're in the southern part of the U.S. A good addition to your library.

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Norman Rice's book is, in my experience, one of the best bee books to come along in years. And it is deceptively simple in its approach. So simple I almost overlooked it as just another bee book! It is not.

Norm Rice spent most of his adult life raising queens in Australia. And, although similar to the above book in that they do some things a bit different, commercial queen rearing is very, very, similar to what is practiced in the U.S.

Rice explains in great detail, and in plain, easy-to-understand language the problems, solutions, tricks and secrets of what it takes to run a huge business. Little is left out – bee biology, and how to make it work for you, not against you; mailing cages; package production; equipment, equipment, equipment; moving bees; selling honey; freighting bees . . Everything involved in the business.

Two quotes stand out from this book: "If you have something to accomplish, do not delay because you are not in possession of the right tools, start the project and better tools will be discovered along the way." This proved the right philosophy for Rice, as it has for most successful business people. And, "It has been an enjoyable and rewarding life." This is the highest praise I can think for a life's choice.

You will be better for reading this book.

Kim Flottum

Continued on Next Page

Ned Kelly and The City of the Bees by Thomas Keneally. Published by David Godine Publishers. 1995 (reissued) 128 pages, b/w illustrations throughout. $10.95 paperback.

"When I was a small boy, I spent a whole summer with wild honey bees in their nest in the hollow of an old mountain ash."

So begins the story of Ned Kelly, who is whisked from his hospital bed by a sympathetic bee named Apis, shrunk to apian size and flown off to actually experience what many of us beekeepers have merely wished we could do – live in a hive.

Ned watches "the girls at the gate" guard against invading wasps and repel bees from other hives. He witnesses the queen being "forced" to create a new queen then leaves the hive with a swarm. He's fed royal jelly. Such adventures help the reader develop a true understanding of bee behavior and the seasons of a hive.

Keneally, who has written many novels, the best-known is probably *Schindler's List*, obviously knows his bees. Yet his witty and engaging story does not stoop to the condescending tone so often used when explaining science to children. Listen to Basil, one of the drones, denounce their annual banishment from the hive. "Are they really going to (hurl) us, sad, solitary, sopping and starving, out into a forest full of enemies?"

Keneally creates wonderful personalities for all the characters, from haughty Queen Selma to bumbling Romeo, her lovesick drone. His rather pragmatic Apis sniffs at the overzealous behavior of some of the younger bees, "Some of them do seven trips a day. I don't know who they're trying to impress. First bit of cold weather in the autumn and they turn over on their backs and die from overwork. I think three trips a day is enough for any sensible bee."

With such dialogue, this isn't a book to just buy and give to a child. It's a wonderful story to be read aloud and savored *with* a child.

Faith Andrews Bedford

Pollen Of The Southeastern United States: With an emphasis on Melissopalynology and Entomo-palynology. 1995. Gretchen D. Jones, Vaughn M. Bryant, Jr., et al. Hard Cover. 110 pgs. Illustrated. ISBN# 0160-8843. $27.00 (check, M.O., Visa or MC). Vaughn Bryant Jr., Sec. AASP Foundation, c/o Palynology Lab, TX A&M University, College Station, TX 77843 (U.S. currency or checks to AASP Foundation).

The United States is one of very few countries that do not 'type' honey for export. That is, the variety is not certified as to the source by any authoritative agency. If Sourwood is on the label, then it's sourwood in the jar. Some countries don't accept that, and as a result, exporting to those countries is difficult, impossible or, at best, expensive. This book is a first step in fixing that problem.

The usual way honey is classified as to source is to identify the pollen that is found in the honey. Sourwood honey should have sourwood pollen in it, right? Right. This book will show you what sourwood pollen looks like, so some determination can be made as to source. If almost all the pollen is clover, sourwood better not be on the label, at least if you expect to export it (and even if it's only on a farm market shelf!).

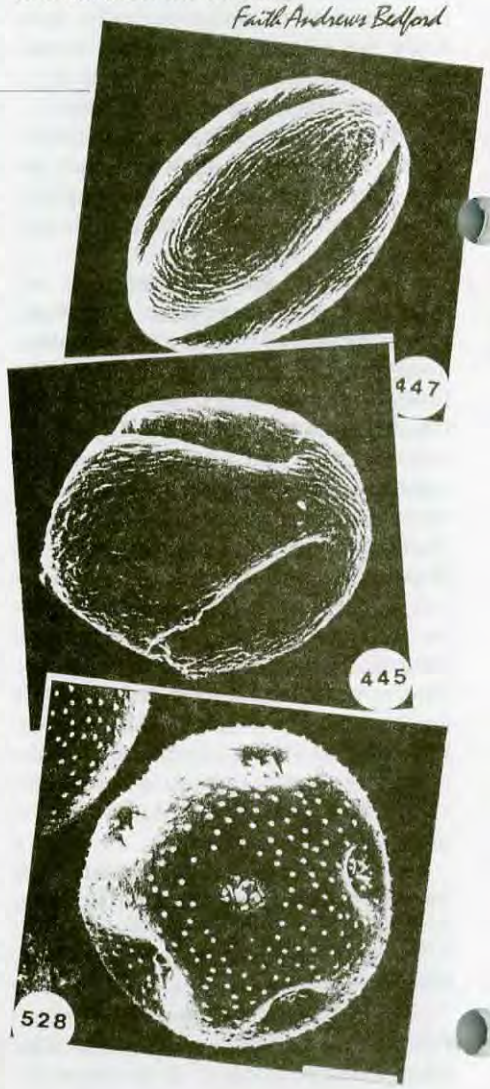
Funded in part by a grant from The National Honey Board, this book covers the plants found in the S.E. part of the U.S. but these plants include many, if not most of the major U.S. nectar sources.

To produce the over 600 photos in this book took the two authors five years for collection, analysis and selection. The quality of every one of these scanning electron micrograph photos is superb.

This book is absolutely required for anyone in the business of classifying honey – beekeepers, packers, exporters. But it is also for the casual botanical minded person who wants to know what the pollens of their favorite plants look like.

You will, however, need a good plant guide by your side because you won't find 'common milkweed' in the index. They use, exclusively, the scientific names for all 600+ plants. When you're done you'll be a honey plant expert – and you better not be putting a sourwood label on your clover honey.

Kim Flottum



RESEARCH REVIEW

roger morse cornell university ithaca ny

"Better living through chemistry – using honey, naturally."

Within the past five years, we have seen an explosion of interest in the use of honey in a variety of food products and in making alcoholic and nonalcoholic drinks. By far the greatest new use is in the beer industry. Several breweries are using honey both for its positive effect on flavor and as a source of sugar for the fermentation.

At the same time, we have seen a number of new wineries making mead (honey wine). Much of this interest is a result of investigations by Robert Kime of the Cornell University Agricultural Experiment Station in Geneva, New York. Kime is also a beekeeper. Only a few years ago, when he was making wine, he noticed that honey clarified the fruit juice to which it was added. This observation led him to make further studies to develop better methods for making honey wine (mead) and also to study honey's antioxidizing qualities.

Experiments that are underway indicate that honey has a future in making hard cider and in the manufacture of an old-fashioned, nonalcoholic summer refresher that is a mixture of honey, vinegar and water. A honey-vinegar mixture was widely sold in the 1950s and 1960s under the name of honeygar. Unfortunately, honeygar had a cloudy appearance and as a result, a poor eye appeal. A few weeks ago, I had an opportunity to taste a new honey-vinegar refresher that is clear, tasty and has great eye appeal.

Yet another use for honey that has appeared recently is the addition of two to three percent honey to grape wine in the place of sulfur dioxide as an antioxidant. The honey is added at the time the grapes are crushed and negates the need to add sulfur dioxide. Tests at the Cornell University Agricultural Experiment Station in Geneva, New York indicate that even after five years, a pinot noir wine to which honey had been added was not oxidized and still had a good flavor.

However, it is not just the alcohol industry that is interested in honey's special qualities. A recent report by McLellan et al. (1995) states that honey may be used in place of a sulfite solution to treat Thompson Seedless grapes in the drying-preserving process to make raisins. Grapes treated with a 10 or 20 percent honey solution, under pressure, "produced lighter and yellower raisins than the commercial and pressure-infused sulfite solution treatments."

Honey has two special qualities whose chemistry remains unknown. It has been found to aid in the clarification of fruit juice without the precipitin of pectin. This is covered in U.S. Patent No. 4,327,115, *Clarification of Fruit Juice with Honey*, given to Robert Kime of the Cornell University Agricultural Experiment Station in Geneva, New York in 1982. A second patent, to C.Y Lee and Robert Kime, is *Stabilization of Wine with Honey and* SO_2, U.S. Patent No. 4,900,564, dated February 13, 1990.

The Ultrafiltration of Honey for Mead Making

Separate from all of the above, but again as a result of promotion by Kime, has been the special treatment of honey for mead making. Honey wine has been a favorite drink for hundreds of years. However, new, clear honey wine usually becomes cloudy, which causes it to lose its eye appeal. No one wants to drink a muddy-looking, murky wine. The cloudiness is a result of a protein precipitate.

Old-fashioned mead makers learned that if they boiled the honey-water mixture prior to the fermentation and carefully skimmed the material that rose to the surface, the product would be clear and brilliant. Still, mead fermentations often became stuck, that is, they would stop before they were finished without an apparent reason. The problem appeared to be that the boiled, skimmed honey-water mixture did not provide an adequate diet for the yeast cells. We found we could circumvent this problem with the addition of yeast food. However, the boiling process had an adverse effect on the delicate sugars in honey and was objected to by several people. Kime and his associates have found that ultrafiltration will remove the proteins that cause the haze. This eliminates the need for the boiling process and results in a much better honey wine.

New studies needed

How and why honey acts as an antioxidant and clarifying agent (two separate features) is unknown. I hope these few comments, in addition to pointing to some new products, might stimulate interest among those of you versed in physics and chemistry. It is a fertile field for study.

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Dr. Nick Calderone of the United States Department of Agriculture's honey bee laboratory in Beltsville, MD, has found that some natural

Continued on Next Page

RESEARCH ... Cont. From Pg. 555

plant oils, especially those from thyme and eucalyptus, are effective in controlling *Varroa* mites. They appear to be an alternative to Apistan strips. According to a USDA news release, the oils are currently being tested in four states. While it is much too early to make recommendations or predictions, the preliminary results are reported to be favorable.

Laboratory tests in Switzerland with several similar plant oils also show good results (Imdorf et. al., 1995). Thymol is again reported as being especially effective.

All this comes at a good time since the present *Varroa* treatments are expensive, and beekeepers in at least one European country report that their mites are showing some resistance to fluvalinate, the chemical found in Apistan strips.

New Farm Legislation

"The current agricultural policy environment of restrictive budgets favors policies that require little net cost to the federal government." This statement, from the USDA Economic Research Service, is one of many indicating that major changes are in the works as regarding agricultural policy, and of course, policy that affects the beekeeping industry.

Subsidy for the beekeeping industry through the price support program has already changed greatly. For those interested in economics, a new paper on the status of beekeeping in the U.S. has just appeared as is cited below. It starts by reviewing the history and purpose of the price support program since 1950. One graph shows that while the number of colonies in the country has been cut about in half since 1945, honey production is almost the same. Several interesting facts are brought to light. For example, 15 packers account for 80 percent to 95 percent of the honey sold through wholesale and industrial channels. Data are presented concerning the value of pollination to the overall economy.

Copies of this paper are available by phoning 1-800-999-6779. The cost is $9.00 postpaid, which is a bit much for a 31-page paper.

How the Dance Language Works

Honey bees learn the distance and direction of a food source by using the time and work used to fly back and forth between their hive and the food. This new information was discovered by forcing the bees visiting a food source to fly in a wind tunnel on their way to and from the food. There was a steady flow of air in the wind tunnel that indicated to the bees that they had gone farther than they actually had flown.

Forcing the bees to fly in a wind tunnel was done in an ingenious way. A magnet weighing less than 10 percent of its body weight was glued to the top of each bee's thorax. A small magnetic rod was used to capture the bees as they approached the food and again when they left. The bees were then placed in the nearby wind tunnel for varying periods of time that would make them use energy and behave as though they had flown farther than they really had. The difference caused by being forced to fly in the wind tunnel could be seen in the way the bees danced. They indicated the food was farther away than it really was. BC

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? DO YOU KNOW ?

Collecting Behavior

clarence collison

Survival in the honey bee colony is highly dependent on the hoarding instinct; the collection and storage of food. This behavior allows colonies not only to survive during periods of inclement weather but also to remain active during the winter in the temperate regions of the world. To bees, food means nectar and pollen. Together these two materials supply both brood and adults with all of their nutritional requirements. How well do you understand the factors affecting foraging behavior and honey bee nutrition?

Please take a few minutes to answer the following questions to determine how well you understand these important topics.

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

1. ___ Nectar and honeydew are processed by honey bees into honey for storage in the comb.
2. ___ Trapping pollen from a honey bee colony stimulates the colony to switch from foraging for pollen to collecting nectar.
3. ___ The viability of pollen diminishes rapidly after it is collected and packed in the pollen basket by the honey bee.
4. ___ All sugars taste sweet and are of nutritional value for bees.
5. ___ Nectar loads of foragers are lighter than pollen loads.
6. ___ A phytocidal acid is added to pollen by the bees when it is packed into the comb.
7. ___ Foragers collecting only pollen obtain their energy from honey that they obtain in the hive prior to leaving on the foraging trip.
8. ___ Honey bees are able to digest all parts of the pollen grain except the thick outer wall.
9. ___ Individual foraging behaviors involved in the collection of nectar and pollen are influenced by both genetic and environmental factors.

Multiple Choice Questions (1 point each).

10. ___ Nectar is temporarily stored and transported back to the hive in the worker's:
    A. Ventriculus
    B. Honey Stomach (Crop)
    C. Proventriculus
    D. Esophagus
    E. Peritrophic Membrane
11. ___ Internally within the worker, pollen is filtered from the nectar by the _____ and passed as a bolus into the midgut:
    A. Malpighian Tubules
    B. Sucking Pump
    C. Pharynx
    D. Esophagus
    E. Proventriculus
12. ___ Enzymes involved in the digestion of pollen are produced by the:
    A. Salivary Glands
    B. Ventricular Wall
    C. Mandibular Glands
    D. Intestinal Wall
    E. Peritrophic Membrane
13. Sugars are one of the principle components of the honey bee diet. Name two ways in which the honey bee uses the sugars. (2 points).
14. What are the four dietary materials supplied by pollen in the honey bee diet? (4 points).
15. A forager collecting only nectar often becomes covered with pollen. What does the honey bee do with this pollen? (1 point).
16. What navigational aids are used by the honey bee as it flies away from the hive and returns? (2 points).
17. The ripening of nectar into honey is initiated by the forager as she takes up nectar from the flower. She adds the enzyme invertase which breaks down the sugar _____ into _____ and _____. (3 points).
18. What is meant by the phrase "scrabbling for pollen"? (1 point).

ANSWERS ON PAGE 594

"Well which is more important . a jar of honey coupon worth 40% off or your dumb football scores?"

BUT THAT WE NEED TO KNOW

Things That Didn't Work

mark winston

We went to see the professional ice-skating show "Stars on Ice" the other night, and what a show it was! The ice was filled with Olympic and world champions: Kristi Yamaguchi, Scott Hamilton, Kurt Browning, Brian Orser, Gordeeva and Grinkov, Underhill and Martini and many more. Perhaps the show should have been called "Perfection on Ice." The evening was filled with the flash of skates, jumps and landings, spangled costumes whirling in a blur of physical excellence. The skaters' grace and smooth flow made it look easy, and the audience was enraptured.

Except: Every once in a while, a skater fell. It didn't happen often, but when it did, the audience deflated with that sound you've all heard from watching Olympic skating on television, a long "Oooohhhh" followed by polite applause to encourage the skater to continue on. It must take enormous courage to leap and twirl above the ice, with only two thin blades to support your landing. In addition there are thousands of people watching intently in the arena and hundreds of millions watching during the Olympics.

We scientists have our leaps and falls too, our projects that don't quite work out, pet theories that crumble under the scrutiny of data. However, we fall in private, and our mistakes are not usually revealed in the public arena when we fall flat on the ground. No, science is released to other scientists and to the public in a carefully crafted form, the published paper or the practiced talk, and both our research colleagues and the interested public rarely get to see the things that didn't work.

I think that's a shame, and I see the impact of the mistake-proof work we present every day when I teach. More and more of my colleagues are telling me the same story that I experience, of desks filled with students who can memorize the results presented in textbooks but have no idea where they came from and usually don't even think to ask. One of my favorite exercises when I'm teaching is to present information out of a text, then suddenly stop and ask my students, "How do we know that? Why do you believe what I and the text just told you?" Their response is invariably empty at first; no one wants to be the first to risk falling on the ice with a dumb answer. Gradually, however, a few brave souls postulate an experiment that could test the information I presented. Eventually, the students realize it's OK to make a mistake, and a new excitement fills the classroom, the thrill of taking a risk and sometimes landing an answer from that intuitive place inside that my students didn't really think they could find.

Scientists are guilty of propagating the low-risk attitude of students by protecting our mistakes from scrutiny. Sometimes I think we need a new journal out there, called "The Journal of Things That Didn't Work." This journal would be dedicated to publishing projects that were brilliant on paper, but got negative results in reality. Negative results are very, very difficult to publish in our current journal system, even for those scientists willing to stick their necks out and say that they don't understand what happened in their experiments. Reviewers almost always take the approach that a study with negative results perhaps wasn't designed properly, or maybe wasn't conducted quite right, and the results really couldn't be all that negative. Sometimes a different approach might be useful, though; sometimes a negative result reveals an interesting phenomenon that another scientist might want to consider.

This subject has been on my mind lately because one of my student's papers that presented just this type of negative result was rejected from a journal (Yes, I fail, and yes, occasionally we do get papers rejected!). The experiments were well-conducted, the statistics carefully done, the writing well-done and to the point. The only problem was that our results did not show a positive answer.

The rejected study examined the role of queen pheromone in mediating worker foraging. This issue is of more than only academic interest, since synthetic queen pheromone could have excellent potential to stimulate colony foraging for pollen or nectar, with obvious economic advantages for beekeepers. Indeed, an earlier study we conducted

Continued on Next Page

"We scientists have our leaps and falls too, our projects that don't quite work out, pet theories that crumble under the scrutiny of data. However, we fall in private, and our mistakes are not usually revealed in the public arena when we fall flat on the ground."

THINGS ... Cont. From Pg. 559

showed that pollen foraging could be increased in package bees by the addition of queen pheromone, although we could not find the same effect in colonies during the summer honey flow. This earlier work, with at least one very positive result, was easily published, but the rejected work surprised us by not showing the same stimulation of pollen foraging that we found in package bees.

The rejected study examined foraging in larger colonies with and without queen pheromone. We tested one group of colonies that were moved to cranberries for pollination and another group of colonies that had been kept in an indoor wintering facility and brought out in the spring. Both contexts would have been economically exciting if we had found that the synthetic pheromone could indeed stimulate pollen foraging, but this was not to be. We had large sample sizes and a fairly complete data set that found no differences between pheromone-treated and untreated colonies. In a few cases, we did find some things that differed from others, but none of the data showed a consistent effect.

Why might this type of negative result be interesting to report in a peer-reviewed journal? The underlying question is a fascinating one: Does the queen influence worker foraging behaviors, and if so, can her influence be bottled and sold as a product? The answers we have found in our work, as well as a number of ambiguous hints we have found in the literature, suggest that the queen does influence what workers will forage for, but this influence is highly context-specific and likely is significant only in very young colonies that do not yet have many other cues to influence worker behaviors. Our negative findings pose all sorts of interesting questions that we may pursue, and other scientists and beekeepers that might have read our results would undoubtedly have come up with other ideas. This isn't to be, however, at least not for a while, since there is no "Journal of Things That Didn't Work." We'll submit our paper elsewhere, and perhaps it will eventually get published, but for now, it remains as a slip on the ice that happened during practice, and nobody saw.

Another pheromone study we performed also had a negative result, although this one we haven't attempted to publish. Many beekeepers have asked me if queen pheromone can be used as a tool to improve queen introduction success. The idea is to add synthetic pheromone to colonies just prior to introducing a queen, or while she is being introduced, to temporarily mask her odor until the workers become more accustomed to her. We have tried this in a number of ways, without success, but haven't tried to publish this information because very few, if any, journals would accept it. Perhaps another scientist or beekeeper who is more clever than we are could learn from our failed techniques and devise a more successful way to use pheromone in this context, but unfortunately, our failures here will remain localized in our laboratory, unavailable for scrutiny.

Not every pilot project or negative result deserves publication, but thorough, well-replicated and interesting work with negative results should have a place in our journals. I know they don't, however, and find myself advising my students to design research projects in which results are likely to be positive, and therefore publishable. After all, a student doesn't want to waste two or three years working on a risky project and have nothing tangible to show for it in the end. My students have been successful with this strategy, and I'd like to believe that our laboratory has made some important contributions by following this approach, but I wonder if we're serving our students well by a system that forces them to postulate hypotheses that are very likely to be accepted by their experimental results.

The one thing that saves me from becoming too cynical about this system is that my research students usually don't follow my conservative advice, but rather push me to let them take risks. Once I open the Pandora's Box of risk taking by asking them, "How do we know .," they keep asking it. They all manage to slip at least a little risk taking into their research, and often it's those risks that lead to the real landmark, breakthrough findings. Yes, many of their more speculative experiments don't pan out and don't get published, and their attempts to land a triple jump just land them sprawled flat on the laboratory bench, and we all let out that "nice try" sigh. But sometimes, sometimes they soar and whirl and land in a seamless flow, with a risky idea that comes to fruition in an elegant experiment. That willingness to risk, to leap, to stretch themselves beyond what they thought they could do, that is indeed perfection. BC

"Not every pilot project or negative result deserves publication, but thorough, well-replicated and interesting work with negative results should have a place in our journals. I know they don't, however, and find myself advising my students to design research projects in which results are likely to be positive, and therefore publishable."

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

TRENDS IN HONEY PRODUCTION IN THE U.S.

eric erickson — robert page

Honey production averages and trends are presented for each state for the years 1939-1981 and 1986-1992, and summarized for the 13 major honey production regions in the United States. Generalized climatic and land use summaries are also provided for each of these regions. These data are presented in the interest of improving the efficiency and cost-effectiveness of beekeeping and for assessing the regional impact of problems such as parasitic mites on the beekeeping industry.

Honey bees rely on ever-changing floral resources for their raw food materials, nectar and pollen. The seasonal and annual dynamics of these resources are driven by weather and climate, topography and soil. Curiously however, comparatively little attention is given to the impact of these natural forces on relative plant vigor (e.g. plant stress) and concomitant levels of nectar and pollen production, or to the impact of the predictable cyclic patterns of these natural forces. Instead, beekeepers seek to improve colony productivity by addressing management practices such as breeding and disease control, providing dietary supplements and by anticipating annual bloom patterns of forage plants.

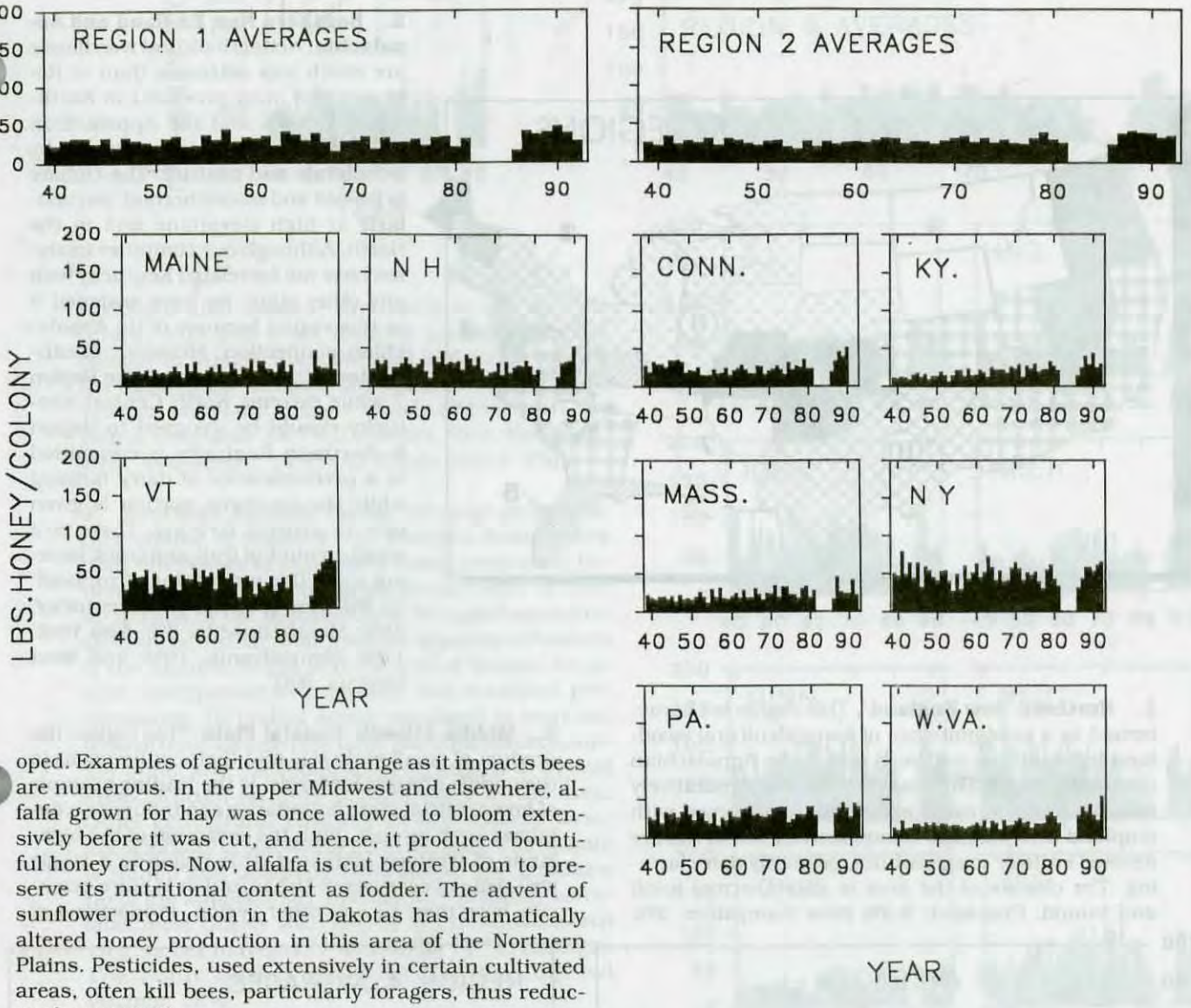
Few attempts have been made to improve colony production or operational efficiency by adapting apiary management strategies to cyclic environmental change. While good colony management is important, it is not a substitute for plant resource availability. A holistic business management strategy that incorporates relative and projected plant resource availability in the process of making business decisions can maximize the cost effectiveness of a beekeeper's enterprise.

The principal natural forces that shape the geography of the earth are climate (the composite of all weather events), topography (land relief) and soil. Climate, regulated by the astronomical position of the earth with respect to the sun, is the single most powerful environmental factor controlling the dynamics of biogeography and ecosystems. Not only do these three forces shape the earth's geography, but there is a dynamic interaction among these forces and the geographic conditions they create. For example, topography, the most stable of the three significantly influences climate and soil type. Elements of climate (e.g. temperature, humidity and precipitation) are altered by air currents established by topographical relief. Precipitation can cause soil erosion, thus altering the topography. The impact of climate on the "development of soil characteristics ranges from macroscale processes affecting surface materials over large continental regions to microscale processes operative in minor niches of rocks and organic residues" Major biogeographical changes can also have a reciprocal effect on climate.

The single most important forces governing the production of nectar and pollen are, in the short term, weather and, over time, climate. Moreover, because weather and climate have predictable cyclic patterns, it can be reasoned that the production of honey bee plant resources will mimic these cyclic patterns. Climate, topography and soil regulate the plant population and its vigor. The plant population, in turn, regulates the development and productivity of honey bee colonies. The distribution of native plant species and the types of crops that are commercially grown are structured geographically and, in large part, determined by climate. However, other physiographic factors also play important roles. Approximately 22 percent of the land in the 48 contiguous United States is devoted to some form of crop production (cultivation): The remainder is covered by native vegetation including grazed or nongrazed grasslands and woodlands. The Corn Belt is the most extensively cultivated region in the U.S. followed by the Northern Plains states. In some other states, less than 5 percent of the land is devoted to crop production.

Honey bee colonies forage extensively over a wide array of native and cultivated plant species. Hence, the production of honey is both a quantitative and a qualitative measure of relative geography. Since 78 percent of the land is covered by native vegetation, it could logically be argued that farming practices would have relatively little impact on honey production. Certainly, in many beekeeping areas this is true. Where annual vegetational change among native species is practically imperceptible, honey production in uncultivated areas is similar from year to year. However, in those extensively cultivated states, a disproportionate share of honey bee colonies are kept near crop production fields, and thus, are impacted by agricultural practices.

Agriculture is also dynamic – changing as new problems are encountered and new technologies are devel-



oped. Examples of agricultural change as it impacts bees are numerous. In the upper Midwest and elsewhere, alfalfa grown for hay was once allowed to bloom extensively before it was cut, and hence, it produced bountiful honey crops. Now, alfalfa is cut before bloom to preserve its nutritional content as fodder. The advent of sunflower production in the Dakotas has dramatically altered honey production in this area of the Northern Plains. Pesticides, used extensively in certain cultivated areas, often kill bees, particularly foragers, thus reducing honey yields.

Previously, honey production data, as gathered by the USDA Statistical Reporting Service over a 43-year period (1939-1981), were structured and quantified by geographic region, and major honey production regions were identified. In this paper, we provide a state-by-state analysis of honey production averages and trends in the United States over the 43 years and for 1986-1992. We believe that utilization of these data will significantly improve the efficiency and cost-effectiveness of any beekeeping enterprise.

METHODS

Data for the total number of colonies maintained for commercial honey production and the average annual honey yield per colony for 1939 through 1981 for the 48 conterminous United States were obtained from Harry Sullivan, USDA Statistical Reporting Service. Similar data for 1986 through 1992 were obtained from Fred Hoff. (Note: No data were taken by USDA for the period of 1982 through 1985.) Data for Hawaii are available only for 1962-1981 and 1986-1992. Data for Alaska are not taken because Alaska has fewer than 1,000 colonies. Methods of data collection and reporting have been presented by the United States Department of Agriculture.

RESULTS

The 12 honey production regions, proposed by Page (1987) are shown on the first map. The data show strong regional trends and annual fluctuations in honey production. The availability of more recent data has allowed us to create a 13th region, Hawaii.

Annual honey yield data for 1939-1981 for each of the 48 conterminous states are presented, grouped by honey production region. The data are presented as the average weight of extracted honey produced per colony. Additionally, data for 1986-1992 for all 50 states are presented. You should recognize that the yearly trends are reported by those beekeepers surveyed in each state, and thus, they may or may not reflect actual yields obtained by other beekeeping operations not surveyed.

Pertinent geographic features of each proposed honey production region, summarized from Goode, Marschner, and NOAA, are presented below.

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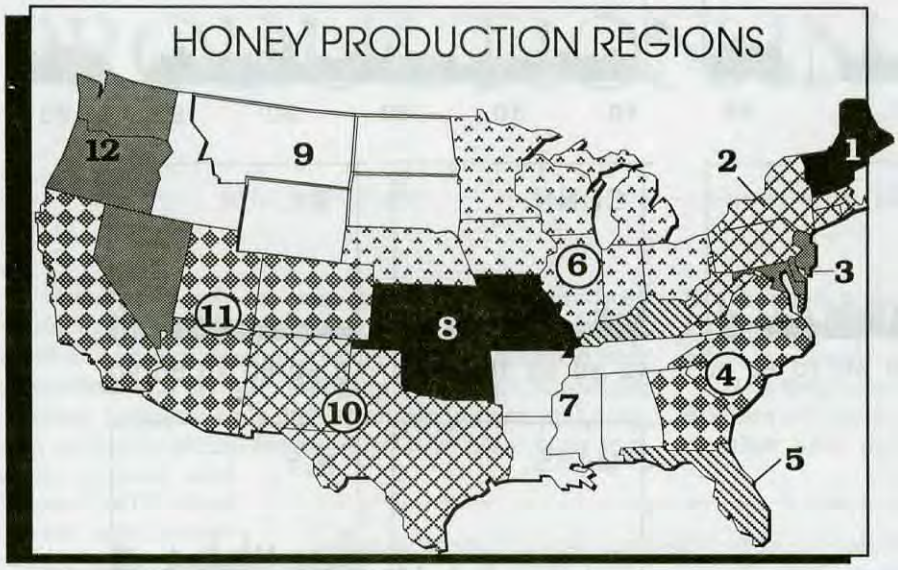
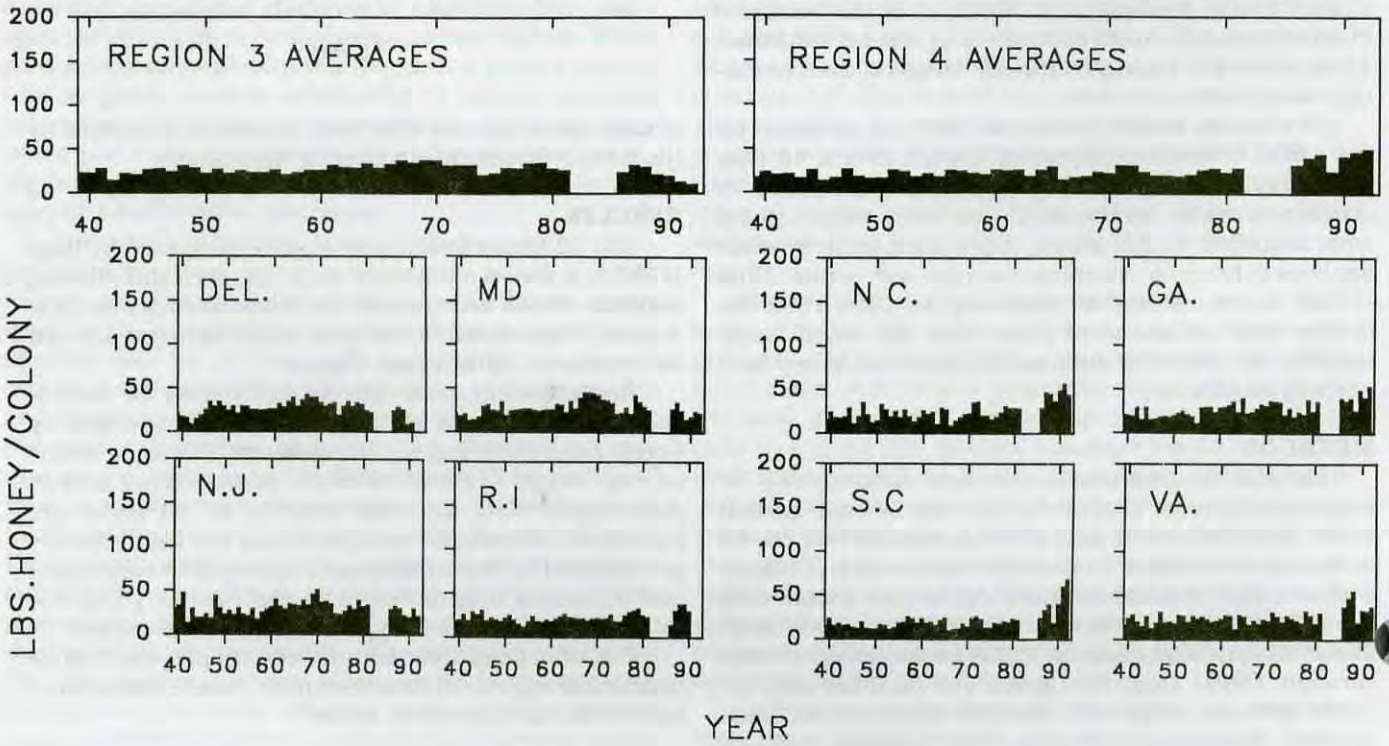
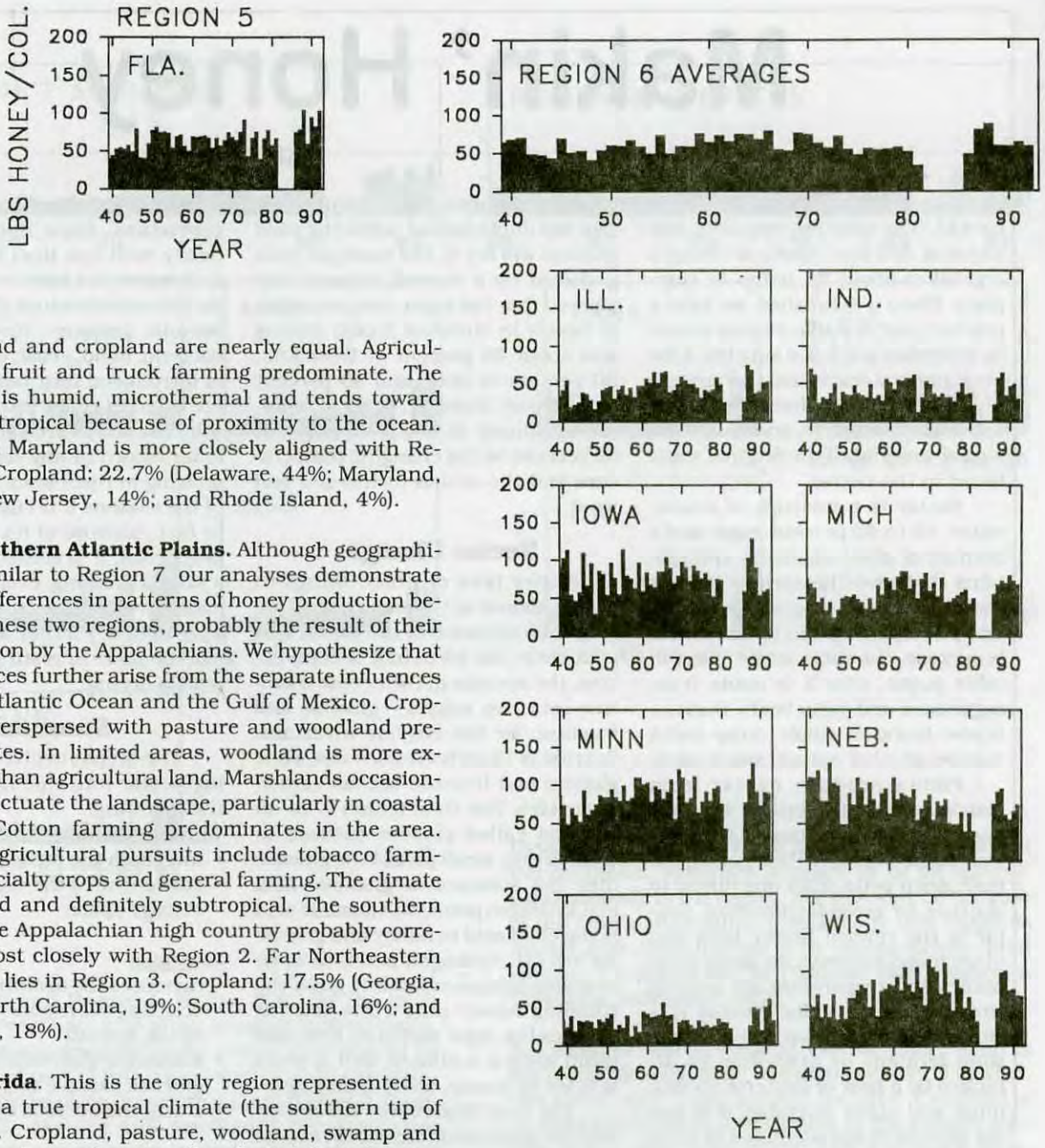


1. Northern New England[1]. This region is characterized by a predominance of nonagricultural woodland hills and the northern end of the Appalachian mountain range. The coastal plain is comparatively narrow. Some forested areas are interspersed with cropland and pasture. Comparatively few areas are devoted entirely to agriculture, primarily dairy farming. The climate of the area is microthermal (cool) and humid. Cropland: 5.3% (New Hampshire, 2%; Maine, 3%; and Vermont, 11%).

2. Southern New England and Appalachia. Nonagricultural woodlands are much less extensive than in Region 1 and most prevalent in Northern New York and the Appalachian highlands. Cropland is punctuated by woodlands and pasture. The climate is humid and microthermal, particularly at high elevations and in the North. Although our computer analyses have not correlated Kentucky with any other state, we have assigned it to this region because of its Appalachian connection. However, Southwestern Kentucky is most like Region 7 while extreme North Central Kentucky should be assigned to Region 6. Northern Kentucky is committed to a predominance of dairy farming while the southern portion is given over to general farming. There is a small amount of fruit and truck farming near the mountains. Cropland: 15.8% (Connecticut, 7%; Kentucky, 38%; Massachusetts, 5%; New York, 17%; Pennsylvania, 19%; and West Virginia, 9%).

3. Middle Atlantic Coastal Plain. This region, the product of small state size and their confinement to the middle Atlantic lowlands, is the leading example of how artificial state boundaries can influence a database such as ours. With the exception of the highlands of Western Maryland, this region is a single well-defined ecosystem. Urbanization is more extensive here than in any other region. Proportions of





woodland and cropland are nearly equal. Agriculturally, fruit and truck farming predominate. The climate is humid, microthermal and tends toward the subtropical because of proximity to the ocean. Western Maryland is more closely aligned with Region 2. Cropland: 22.7% (Delaware, 44%; Maryland, 29%; New Jersey, 14%; and Rhode Island, 4%).

4. Southern Atlantic Plains. Although geographically similar to Region 7 our analyses demonstrate clear differences in patterns of honey production between these two regions, probably the result of their separation by the Appalachians. We hypothesize that differences further arise from the separate influences of the Atlantic Ocean and the Gulf of Mexico. Cropland interspersed with pasture and woodland predominates. In limited areas, woodland is more extensive than agricultural land. Marshlands occasionally punctuate the landscape, particularly in coastal areas. Cotton farming predominates in the area. Other agricultural pursuits include tobacco farming, specialty crops and general farming. The climate is humid and definitely subtropical. The southern tip of the Appalachian high country probably correlates most closely with Region 2. Far Northeastern Virginia lies in Region 3. Cropland: 17.5% (Georgia, 17%; North Carolina, 19%; South Carolina, 16%; and Virginia, 18%).

5. Florida. This is the only region represented in part by a true tropical climate (the southern tip of Florida). Cropland, pasture, woodland, swamp and marshlands are almost uniformly distributed across the region. Honey production is measurably different from that of adjoining states. Northwestern Florida is less intensively farmed and may be most appropriately attached to Region 7 The southernmost region is fully tropical. Principal agricultural pursuits are fruit and truck farming with some general farming. At least 50 percent of the state is nonagricultural. The climate is uniformly hot and humid. Cropland: 11%.

6. Eastern North Central Plains. Cropland predominates in Region 6, 80% of the land mass in some, particularly southern areas. The southern extremes of Illinois and Indiana should probably be assigned to Region 7 Northern areas of Michigan, Minnesota and Wisconsin are heavily wooded, and nonagricultural swamp and marshlands are extensive. Western Nebraska is most like Region 10, while extreme Southern Nebraska might be more appropriately included in Region 8. Northern agricultural areas of this region are largely committed to dairy farming and vegetable production; southern areas produce feed grains and livestock. Fruit crops are produced primarily in the coastal areas of Lake Michigan. The climate of this region is humid but generally microthermal, with severe winters: Summers further north are cool, while those of the southern extreme are intermediately warm. Cropland: 50.4% (Illinois, 71%; Indiana, 59%; Iowa, 78%; Michigan, 23%; Minnesota, 46%; Nebraska, 49%; Ohio, 47%; and Wisconsin, 30%).

7. Eastern South Central Plains. The Appalachian Mountains constitute a significant barrier between

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Makin' Honey

roger morse

Honey bees make honey from nectar. The process requires one physical and two chemical changes and takes about 24 hours to complete. When it is finished, we have a product that is stable, resists attack by microbes and has a long life. Like most natural reactions, the process of making honey from nectar is never fully complete, and honey has a small amount of the original sugar found in the nectar.

Nectar is a mixture of mostly water, 15 to 45 percent sugar and a number of plant pigments and proteins that give the various honeys their distinctive colors and flavors. The principal sugar in most nectars is sucrose, the same sugar found in table sugar which is made from sugar cane and sugar beets. Sucrose is also found in maple syrup and a number of other natural sweeteners.

Plants produce nectar from glands in their flowers for the purpose of attracting insects that will visit them and carry their pollen, the male germ cells, from one flower to another for cross-fertilization. Nectar is the reward honey bees and other insects receive for being pollinators and responsible for moving the male germ cells. Nectar is a simple sugar solution which would soon ferment or otherwise be attacked by a host of bacteria, molds, fungi and other microbes if it was not harvested and protected by bees.

Nectaries

Most plants hide their nectaries, which forces bees to visit each flower to determine if any nectar is present. It usually takes a bee three to four seconds to determine if nectar is present or not. The hidden nectaries force the bees to explore each flower individually and, as a result they become covered with pollen that they carry to the next flower they visit.

In addition, hiding their nectaries and nectar protects the nectar from drying too fast. Interestingly, however, on warm, windy days, some nectars dry so much that sugar crystals form, but this is rare. We find that the sugar concentration of a plant's nectar will change as the weather changes. High humidity or rain will dilute nectar, while the wind and sun will dry it. For example, data gathered on a normal summer day showed that the sugar concentration of nectar in birdsfoot trefoil flowers was about 20 percent at 9:00 a.m., 30 percent at noon and 40 percent by 3:00 p.m. However, by six at night, it was diluted to about 30 percent, all because of the changing temperature and the action of the sun and wind.

Nectar Changes

Honey bees do three things to nectar almost at the same time. One is to remove much of the water; this is done in the hive. In a second action, the sucrose in the nectar is broken into two sugars – glucose and fructose, by the enzyme invertase. Sucrose is 12 carbon molecules, while glucose and fructose are six carbon molecules. The third action is for an enzyme called glucose oxidase to break a very small part of the glucose into two substances, gluconic acid and hydrogen peroxide. Gluconic acid is the chief acid in honey and gives it its low pH. Hydrogen peroxide is an unstable compound, but it gives the ripening honey protection until it reaches the right moisture level and again when it is diluted, as it is when it is fed to young, larval honey bees.

The bees that collect the nectar add the enzymes immediately, except for old foraging bees whose enzyme-secreting glands have deteriorated. When a successful foraging bee returns to the hive, she always gives the nectar to enzyme rich house bees that are two to three weeks old. They then force the ripening honey in and out of their proboscis, or tongues. This serves to mix the enzymes with the new honey.

Most of the new nectar drying occurs in the evening, when the full work force of a colony is available. During a honey flow, a time when bees are harvesting large quantities of nectar, you can smell the volatile portions of the nectar that are being removed as the water is evaporated.

Removing Water

Everything that lives must have a suitable environment to grow and reproduce. Ripe honey that is, honey with less than about 19 percent water, is a hostile environment for microbes because of what we call osmotic pressure. Any live, active bacteria, mold, yeast, or fungus that is introduced into honey loses water from its cell(s) into a rich sugar solution, and as a result it dies. There is no record of any microorganism growing in ripe honey, which is one of the reasons it is such a safe food. In fact, because of its antibacterial properties, it is sometimes used as a wound dressing, even today. However, several organisms can remain alive in honey if they are in what we call the spore or resting stage which resists drying.

Summary

The steps involved in converting nectar into ripe honey achieve the following:

Water Reduction

- increases the osmotic pressure
- concentrates the sugar and saves storage space

Invertase

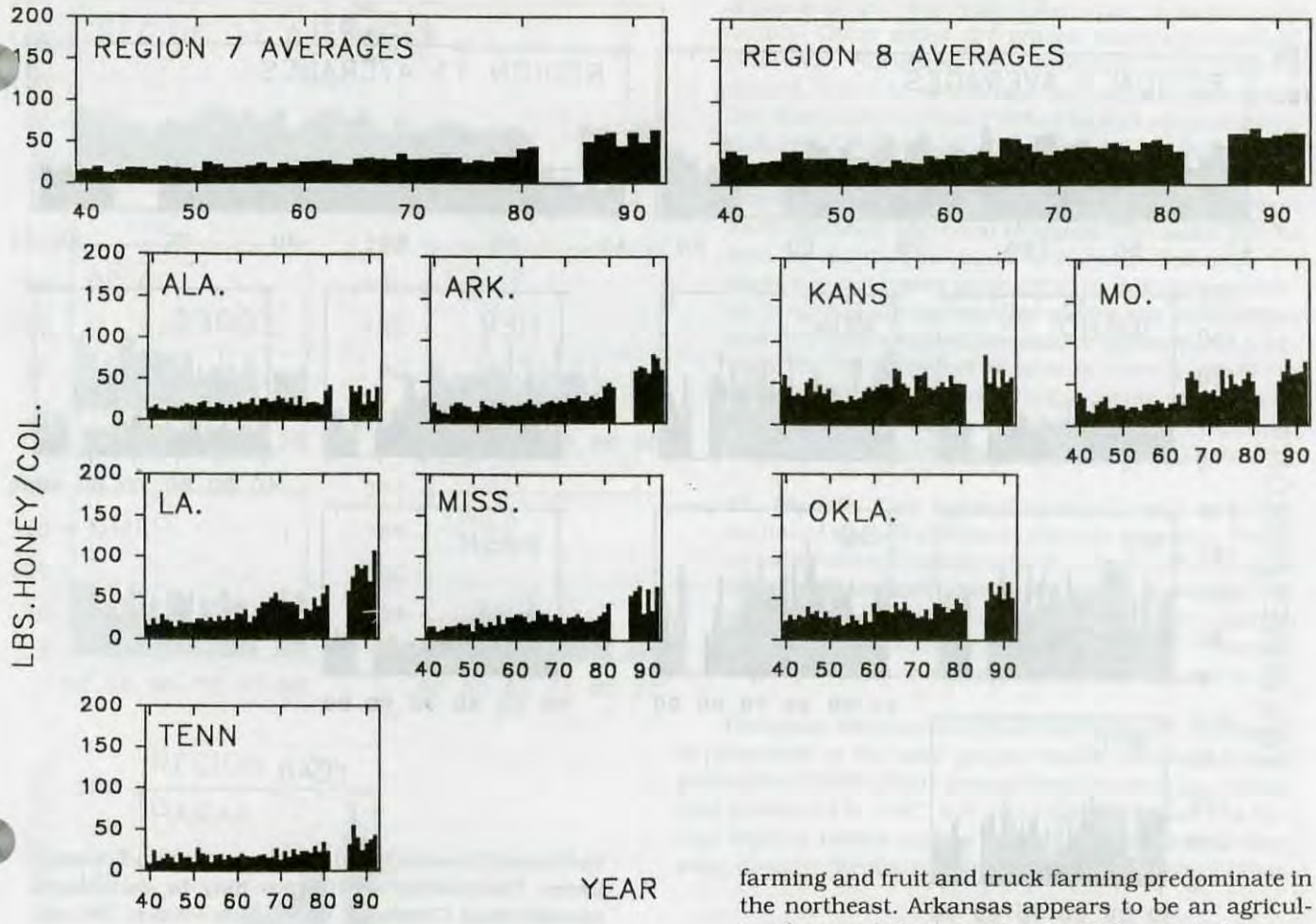
- increases the osmotic pressure by doubling the number of molecules in the system
- makes the glucose available for the glucose oxidase enzyme
- starts the sucrose digestion

Glucose Oxidase

- produces gluconic acid to achieve a high acidity (low pH)
- produces hydrogen peroxide, which protects diluted honey

It's Honey!

The golden liquid most of us harvest, extract and put in a bottle is the result of a complex and sophisticated chemical process. Honey bees perform this transportation on a daily basis, and, ultimately, we routinely consume the finished product with little thought of the effort and work required to produce it. Not only are bees required, but the geographical, climatological and edaphic factors that play a role must be considered.



this area and Region 4. Region 7 is, for the most part, the southern half of the Mississippi River Delta. East Texas is geographically similar and should be considered part of this region even though our statewide analyses place the entire state in Region 9. Cropland with pasture and woodlands predominates. Woodlands are extensive in some areas; swamp and marshlands are common, particularly in coastal areas and river bottoms. Cotton production is extensive, while general farming is less prevalent. Specialty crops, fruit and truck farming predominate in coastal areas. The climate is subtropical. Cropland: 24.4% (Alabama, 15%; Arkansas, 31%; Louisiana, 20%; Mississippi, 26%; and Tennessee, 30%).

8. Central Plains. This region, which is west of the Ozarks, appears agriculturally and climatically similar to Region 6 (Southeast Missouri should be in Region 7). However, our analyses expose significant differences in honey production patterns between these regions. These differences may exist because Region 8 is, in reality, a transition zone between North and South. Northern areas are largely planted in small grains, and cotton is grown in the southern and southeastern areas. A mixture of feed grain, general farming and fruit and truck farming predominate in the northeast. Arkansas appears to be an agricultural anomaly in the region, but this may be because of the Ozark Mountains. Climatically this region is humid and mesothermal with comparatively mild winters. Cropland: 49.3% (Kansas, 66%; Missouri, 46%; and Oklahoma, 36%).

9. Western North Central Plains. This region is distinctly different from Region 6 because of its relative aridity and topographical features. Cropland is devoted primarily to small grains in the eastern portion. While there is scattered fruit and truck farming throughout, range livestock production predominates in the West. Non-agricultural areas are present at higher elevations. The climate is semiarid and microthermal with cold winters and a relatively short growing season. Cropland: 29.6% (Idaho, 13%; Montana, 20%; North Dakota, 66%; South Dakota, 44%; and Wyoming, 5%).

10. Western South Central Plains. Except for the eastern half of Texas, this region is semidry grassland and, with some exceptions, used to graze range livestock. Areas of North Texas are irrigated for crop production, while southwestern areas of both states are desert shrubland that is occasionally grazed. East Texas should be assigned to Region 7 Woodlands are most prevalent at the southern reaches of the Rocky Mountains. The climate is semiarid to desert

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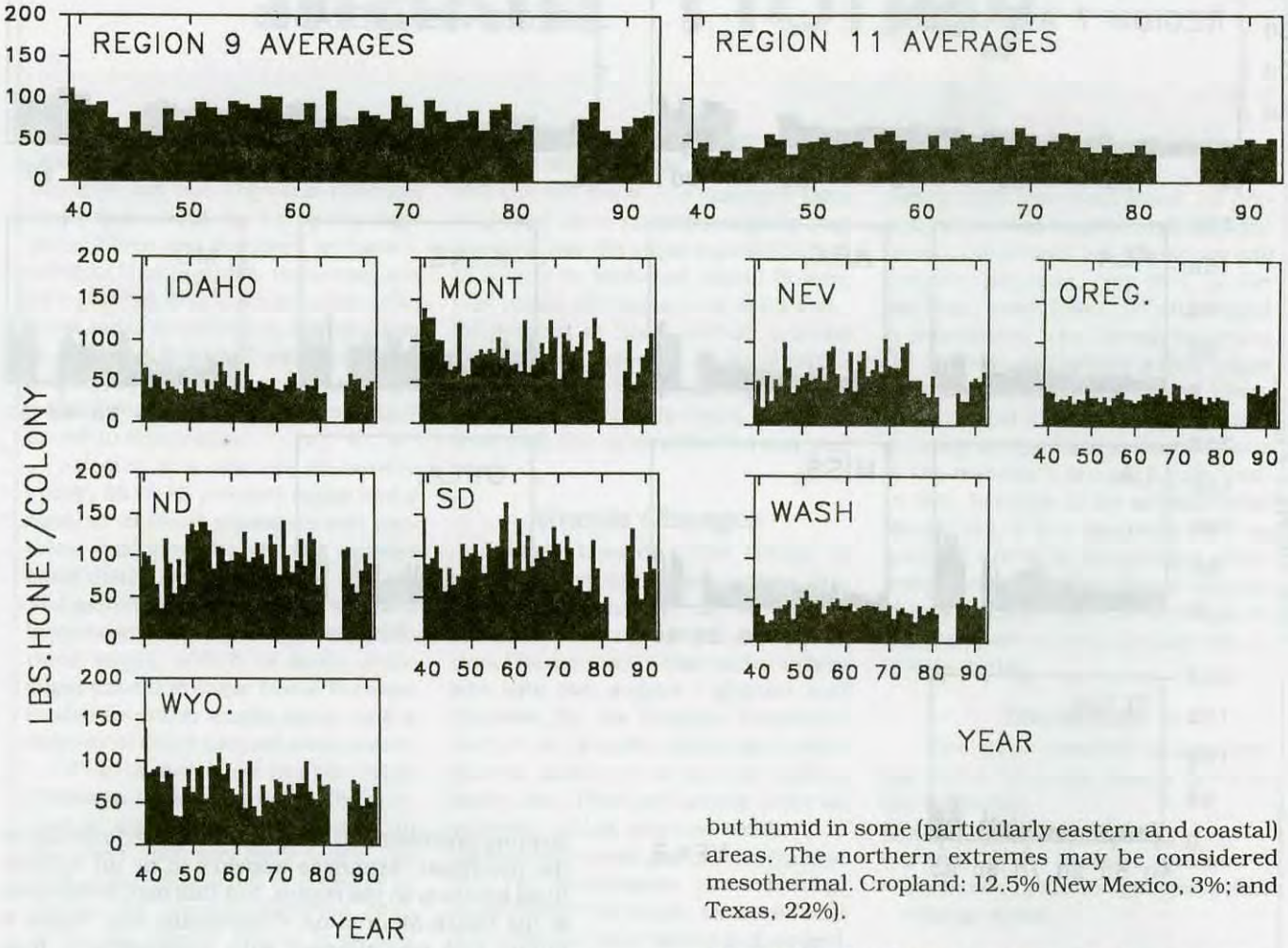
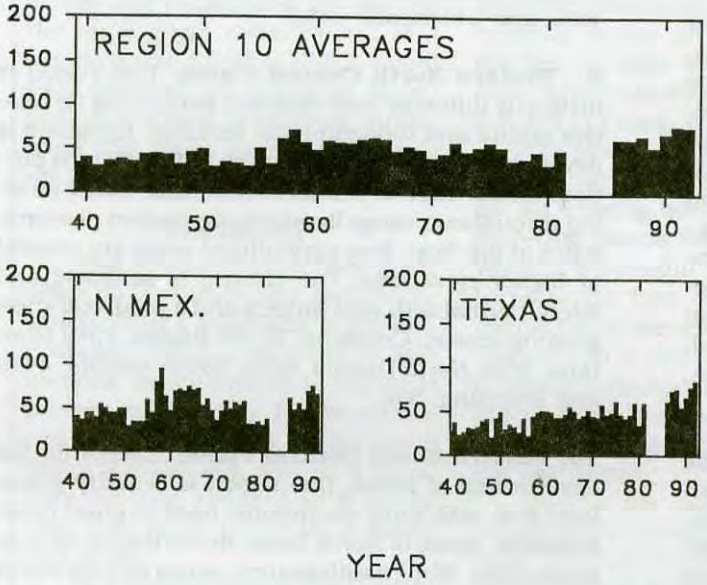
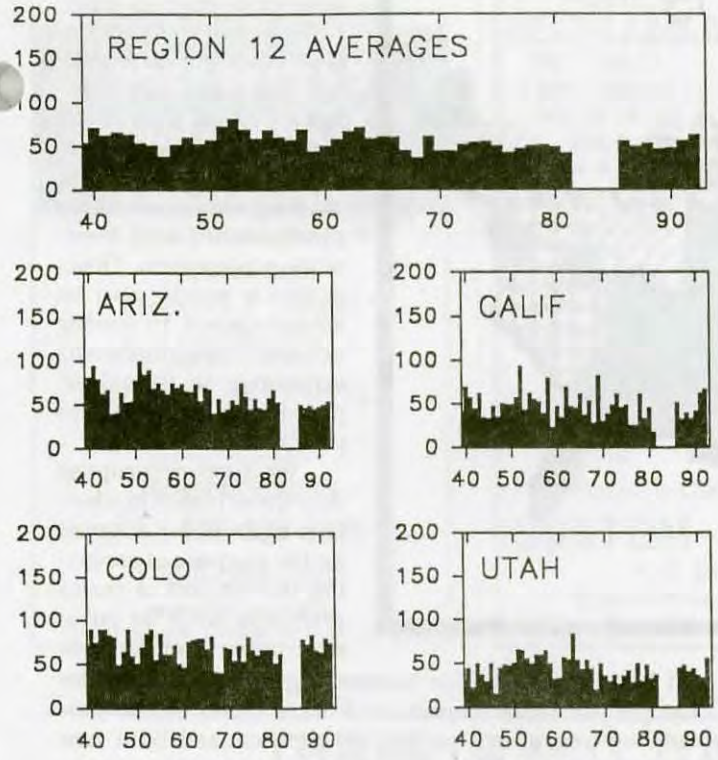




but humid in some (particularly eastern and coastal) areas. The northern extremes may be considered mesothermal. Cropland: 12.5% (New Mexico, 3%; and Texas, 22%).

11. Pacific Northwest. Initially, we found it peculiar that honey production in Nevada correlated most closely with that of Oregon and Washington (both coastal states). However, closer examination revealed unexpected similarities in the climate and topography of the eastern slope of the Cascade/Sierra Mountain range. The agriculture is diverse among these three states, ranging from limited areas featuring a predominance of fruit and truck farm production in Washington to extensive livestock production on desert shrubland in Nevada. Ungrazed woodlands predominate in the western third of Washington and Oregon while the eastern (semiarid) portions are agricultural. Large segments of these states include non-agricultural highlands. The climate in the principal agricultural (and honey producing) areas of this region is semiarid and generally microthermal. We would be inclined to place the southern third of Nevada in Region 11. The higher elevations of this region probably have little impact on honey production records since most bees are to be found in the agricultural areas below. Cropland: 10% (Nevada, 1%; Oregon, 9%; and Washington, 20%).

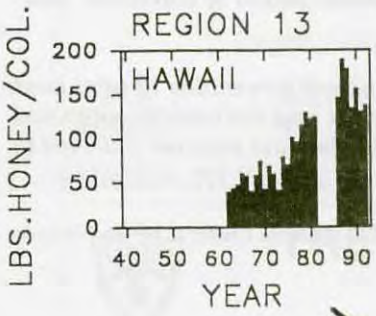
12. Southwest. The most notable terrain feature of this region is the desert. Higher elevations may be

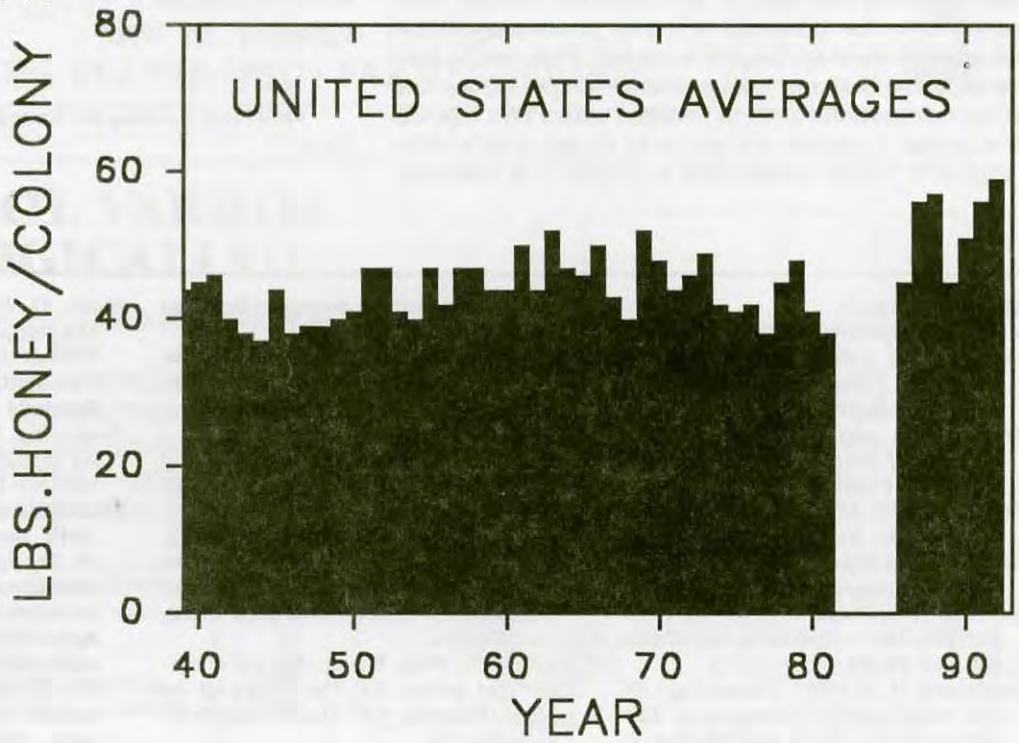


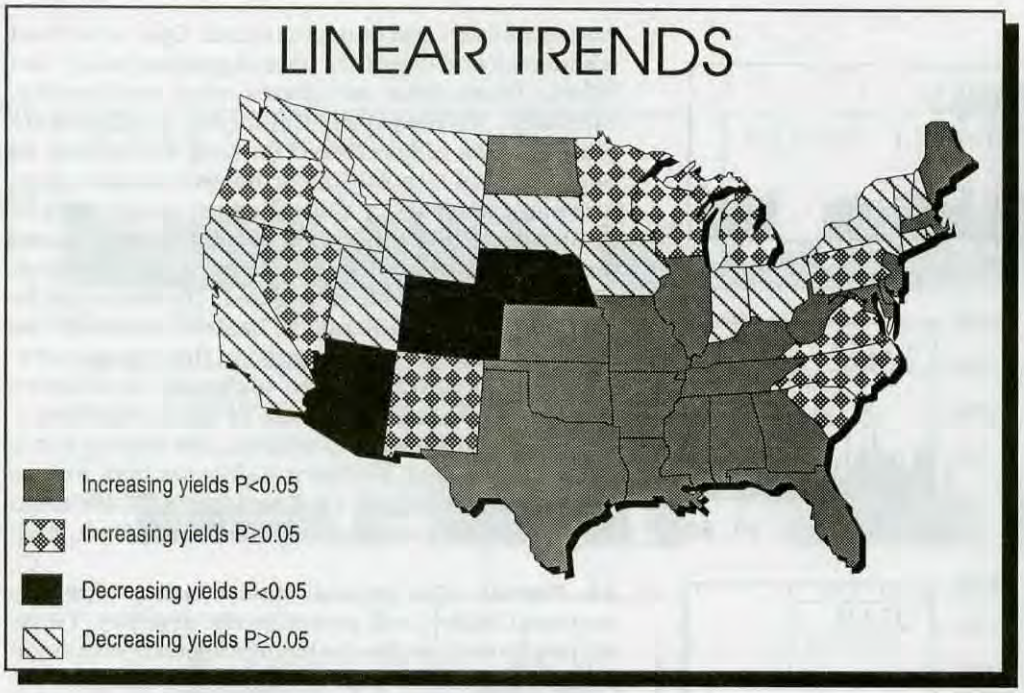
heavily forested and nonagricultural. Open woodland (chaparral) and desert shrubland predominate in the South. These areas are grazed when appropriate. Similarly, Northwestern California is extensively grazed. Areas of specialized farming are present in Southern and Central California and southwestern Arizona. California, a coastal state, would seem to be an anomaly in this region because Northern and Central California valleys are extensively farmed (fruit and vegetable) and often irrigated. The same can be said for the river lowlands of Eastern Colorado. We presume that honey production in this region correlates among states because of climatic similarities and to a lesser extent because of agricultural practices. Except for higher elevations, the climate is dry and megathermal. Northern California may well be better placed in Region 12. Cropland: 8.7% (Arizona, 2%; California, 11%; Colorado, 18%; and Utah, 4%).

13. Hawaii. This tropical state consists of widely scattered islands and great climatic diversity. Tropical rain forests predominate, interspersed with small areas of grassland and desert shrubland. The climate is mesothermal and characterized by uniform temperatures that vary by only 8-20°F. Principal crops are sugar cane and pineapple. Cropland: 8.4%.

The mean annual honey yield for all states combined is presented in the next graph. Linear trends in honey production (1939-1981) among the conterminous states, first published in 1987 are also reproduced here to further explain trends among individual statesin the final map. Clearly, there are states wherein the average honey







yields per colony have steadily increased over the 43-year period. Decreases over this same period have been evident in other states. Overall, honey yields increased in 29 states and decreased in 19. The solid colors depict areas of significant change, whereas the crosshatched zones exhibit trends that are not statistically significant.

Since state and regional honey yield data are structured and geographically driven, we suggest that they be adopted as the means for assessing and reporting honey production in the United States. Moreover, we believe that by understanding area wide patterns and trends in honey production, beekeepers can significantly improve the efficiency and cost-effectiveness of their enterprise. These patterns and trends, as presented, clearly demonstrate how the business of honey production differs from state to state and region to region. This can be seen by comparing both net honey production per colony and annual fluctuations in yield between states and regions. For example, compare the states in Region 3 with those in Region 6. Honey production in Region 3 is comparatively low but generally constant year to year, while honey yields in Region 6 are much higher but fluctuate widely between years. Trends in the data may be used by individual beekeepers in making their economic assessments and business projections. Obviously, it would also be advantageous to modify colony management strategies to fit anticipated yield from year to year.

We further propose that these honey production regions be adopted for the purpose of assessing the impact of major problems such as parasitic mites and Africanized honey bees on the beekeeping industry. Here for example, dramatic departure from a trend of the past could be interpreted as having been caused by a new mitigating factor. This more precise measure would be helpful in the timely implementation of corrective measures. BC

[1]*Cropland values represent percentiles of total land area/region (state) cultivated and harvested, cultivated but not harvested and cultivated and summer-fallowed in 1978.*

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OBSERVATION HIVES

dewey caron

Part X

thomas webster

Preparations for Winter

The honey bee is the only insect in North America that manages to keep warm through the winter. This is quite remarkable, considering the extremely cold weather we can get in northern regions. In most parts of the United States, however, an observation hive will not be able to survive the winter. Generally, it will contain too few bees to form the cluster they need to keep warm. The observation hive walls are usually too thin – the bees will lose a lot of heat through unprotected plexiglas or glass. However, it is possible to observe some of the ways bees prepare for winter.

Feel the heat from the cluster If the hive is kept in a relatively cool room, the bees will be considerably warmer than the room. Place your hand on the transparent side of the hive, over the center of the cluster of bees. Now place it in the corner, away from the cluster. You will notice a real difference.

By changing the temperature of the room where the hive is kept, you will see the clustering behavior. The cluster of bees will contract into a tighter ball as the surrounding temperature drops. As the room warms again, the bees disperse. Measure the size of the cluster using your plastic sheet. Set room temperature at 50° and measure the cluster and note the behavior. Then, set room temperature at 75° and do the same. Depending on the number of bees in your hive, you can begin to correlate the cluster size and room temperature.

A bee generates the extra heat needed in winter by "shivering" with the flight muscles in its thorax. About 20 percent of the weight of a worker bee is in its flight muscles, so they are effective in making a considerable amount of heat. In the cluster, bees are close enough to each other that their body hairs overlap to make a continuous blanket that holds the heat in. Since the bee hairs are branched, like feathers, the cluster is well insulated.

The temperature of the cluster depends on whether the colony is rearing brood. The optimal temperature for brood rearing is around 92° to 94°F. When brood rearing stops, the bees lower their cluster temperature to about 65°F By lowering the temperature, the colony can get through the winter by consuming its stored honey more slowly. Watch the decline in the size of the brood area as fall and winter approach.

Watch for robbing if the observation hive is fed with a feeder near the bottom of the hive. At this location, it is easy for potential robbers to find. You may see a large number of bees coming to the feeder and flying outdoors after feeding. Eventually, the robbers may find the honey stored in the comb and seriously deplete the nest.

If you suspect that your observation hive is being robbed, look for evidence of bees fighting with each other at the entrance. It is sometimes helpful to reduce the size of the entrance to discourage robbing. Stop feeding the hive if the feeder is near the bottom of the hive. This is one reason that observation hives are often designed for a feeder at the top.

Protection There are several things you can do to protect your observation hive if you decide to overwinter it inside. As noted above, check the entrance for robbing. Reduce the entrance size if this is a problem. Also, provide a wood block to reduce direct drafts, but allow ventilation.

Make sure there is some stored honey and pollen inside. Even if you're feeding, a frame or two of honey and pollen serves to stimulate the population, especially when (and if) brood rearing begins in early spring.

Keep the thin glass (plexiglass) sides covered as much as possible. Not only covered, but insulated – well insulated. Glass and plexiglass conduct heat *away* from the cluster, which is only a single bee deep. Keeping warm, especially with brood present places a great deal of stress on the population.

A covering of styrofoam works well, secured tightly to the entire surface – corner to corner, top to bottom – goes a long way in helping.

Take care to maintain ventilation so moisture doesn't build up inside and collect on the glass in the warm brood area. Be sure to provide water, as plain water or in a light sugar syrup, at all times. This provides metabolic water and water to aid in dissolving any crystallized honey.

Be sure there are enough bees. A simple suggestion, but vitally necessary for colony survival. In the artificial environment of an observation hive, a queen generally will cease laying earlier in the fall and start later in the spring. This is due to limited resources, few nurse bees and general stress. A colony with a strong (relatively speaking) population can overcome many of these difficulties.

Overwintering an observation hive can be done. To do so requires the same management principles as other, regular sized colonies, but in a more intense and detailed manner. However, the reward for your work is to have bees all year – not just in season. BC

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THE OBSERVATION HIVE As A Research Tool

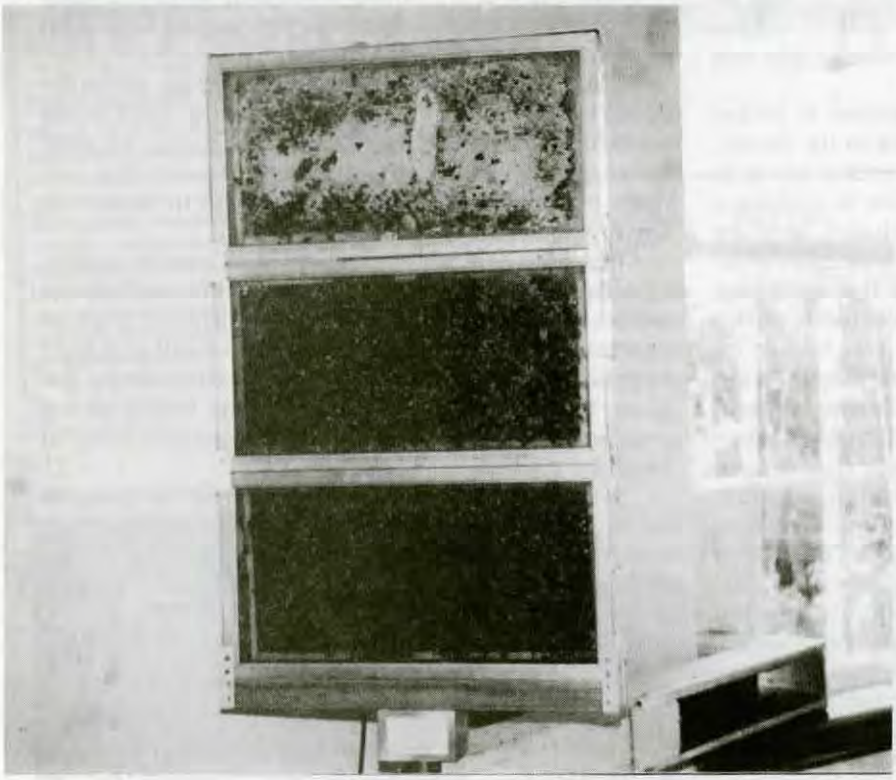
ann harman

The very nature of bee colonies has probably been a source of frustration to beekeepers since man first kept bees. What *are* those bees doing in there, anyway? In the early days of beekeeping with fixed-comb hives, observation hives were constructed but they allowed only a portion of the colony to be visible. With the advent of the movable-frame hive, it became possible to observe many aspects of colony life. However, opening a hive, even with no smoke, causes confusion and also makes it impossible to observe behavior over long periods of time. Therefore, it was inevitable that observation hives a single frame thick would become extremely useful.

We are used to seeing an observation hive on display at a nature center, at a county fair, or being carried to schools as part of an educational program. The educational and entertainment value are great. Even seasoned beekeepers will stand in front of an observation hive looking for the queen and perhaps for dancing workers. However, the observation hive has made significant contributions to our understanding of the life of the honey bee. The observation hive is, and has been, an important research tool.

Scientists can design and construct observation hives suitable for their particular research. For example, if an observation hive is constructed carefully, with just one beespace between the comb and the glass, then only one layer of bees will be able to cover the comb. This type of construction allows easier viewing although it makes it more difficult for the bees to move about and to keep brood warm. Observation hives can be just one frame, with perhaps a frame for food, or several frames tall or wide or both.

The common observation hive can be a tool for some uncommon research.



It would be impossible here to relate all the information gleaned from research that used observation hives. However, a few examples can help realize the value of observation hives in the hands of scientists.

Perhaps the most famous example is the work of Karl von Frisch. He described and illustrated his designs for observation hives in his book, *The Dance Language and Orientation of Bees*. During his many years of study, von Frisch needed several observation hives and designs: One was large with six combs; one was small and easily transported; one could be tilted and held at different angles. Some of his observation hives were installed in huts to simulate the darkness of an actual hive. Others were positioned in a roofed stand which blocked out the bees' view of the sky and protected them from direct sunlight. Von Frisch also built a glass entrance passage to the hive so that the observer had enough time to identify marked bees walking into and out of the hive. He installed a movable "door" or wedge to guide incoming bees to one side of the frame so that the observation hive could be manned by only one observer. His descriptions and drawings are meticulous, reflecting his dedication to his studies.

And what did von Frisch discover? Certainly every beekeeper has heard of the dance language of bees. Over a period of years, von Frisch marked the foragers, trained them to food sources and observed the returned bees. The patterns of behavior he observed showed him that the bees were able to communicate distance, direction and richness of nectar sources. Furthermore, he found that sunlight affected the bees. This led him to the discovery that bees use the polarized light from the sun for orientation.

At first, von Frisch was surprised

by his own findings. Other scientists, skeptical, verified his work with observation hives of their own. In the foreword to von Frisch's *Bees Their Vision, Chemical Senses and Language*, Donald R. Griffin quotes Dr. W. H. Thorpe, who repeated some of von Frisch's experiments – with an observation hive, of course. Griffin then said, "I confess without embarrassment that until I performed these simple experiments myself, I, too, retained a residue of skepticism. But a few weeks' work with an observation beehive and a colony of bees led me to the same degree of conviction as that which Thorpe reports."

Von Frisch then explored more of the bees' hidden lives. He used observation hives to determine whether adult bees of a given age and performing age-appropriate tasks could shift tasks to fulfill the needs of the colony. The success of this set of experiments thus unlocked more of the secrets of the honey bee colony.

However, von Frisch was not able to find an explanation for one of his observations. Many are familiar with his descriptions of the waggle dance and the round dance. He also described another dance which he named the tremble dance. Although observed by scientists since von Frisch, the tremble dance message remained untranslated until Dr. Thomas Seeley of Cornell University began his studies of it just eight years ago. Seeley set up a two-frame observation hive with an entrance wedge similar to one of von Frisch's. From Seeley's observations, published in 1992, he stated that the bee is saying with the tremble dance: "I should refrain from recruiting additional foragers to my nectar source." Now you might think that having found this piece of the dance puzzle, all is solved. Not so. The questions posed by Seeley at the end of his paper insure that he, and other scientists, will be peering into observation colonies for quite some time.

Of interest to those who wish to follow the foraging and dancing behavior of honey bees, Seeley has authored a book entitled *The Wisdom of the Hive* to be released this month. In this book, he describes his observation hives and experiments on foraging behavior.

Since foraging behavior is so easily monitored with observation hives, it is no surprise that other topics have been selected for study. One such study performed at the Baton Rouge Bee Laboratory demonstrated that bees do have a preference for feeding areas. Some bees prefer to forage close to the hive and others at a greater distance from the hive. One interesting part of this study was that the bees in the "close nectar source" group were related to each other, as were the bees in the "long distance source" group, but the groups were not closely related to one another. Another study with two similar groups of bees, each group closely related within itself, but separate groups not closely related to each other, showed that bees will follow recruiting dances more within their own group than they will follow dances from a distantly related group. Such specialization within a colony of bees would be the most efficient way of foraging.

"Observation hives are truly one of the remarkable research tools."

Not all observation hives are used for foraging behavior studies. Recently, Gloria DeGrandi-Hoffman and Joseph H. Martin of the Carl Hayden Bee Research Center in Tucson used two-frame observation hives to study egg-laying behavior of virgin and mated queens. Numerous details of their behavior were recorded. The study also investigated the reaction of unrelated worker honey bees to both virgin and mated queens and to their egg-laying behavior. The virgin queens, unrelated to the workers, were cared for as well as the mated queens were. The scientists found that the mated queens in general laid more eggs than the virgin queens. The colonies with only virgin queens did produce some laying workers. However, no preference was shown by the workers for raising drones from laying workers.

Scientists have been studying various aspects of Africanized bees for many years. With an observation hive, the behavior of a colony of Africanized bees can easily be compared with the behavior of a European colony. Foraging activity, dancing behavior, recruitment, nectar collection and storage were all studied with observation hives established in Venezuela by the Baton Rouge researchers. This work, done in the mid-80s, greatly expanded our knowledge of the Africanized bees, and, of course, raised more questions for further study.

It has been known for some time that some stingless bees, frequently called "fire bees" were able to rob honey from honey bee colonies without the honey bees taking defensive action. The secret to such easy robbing is a secretion made by these stingless bees. In order to study the effects of this secretion, bees were installed in observation hives at the Baton Rouge Bee Laboratory. Then, tiny cups containing the secretion chemicals were introduced into the observation hives. It was easily seen that the secretion repelled the honey bees, thus making it very easy for honey stores to be stolen. Although the secretions are quite irritating to humans, causing pain, it is possible that such secretions could be formulated as honey bee repellents for chasing bees from honey supers.

The numerous facets of foraging behavior, queen egg laying, comparisons of Africanized to European honey bees and possible bee repellents are just a very few of the many studies done in the United States and abroad with observation hives. The scientists will continue their research, and the beekeeping community will continue to benefit from their observations. Dr. Tom Rinderer was right when he said that "observation hives are one of the truly remarkable and useful tools of honey bee science."BC

Ann Harman is a free lance beekeeping author and frequent contributor to these pages.

FIRE AT KELLEY'S

A fire that started from a non-specific electrical problem completely destroyed the wax storage and foundation manufacturing building at the Walter T Kelley company on the morning of August 28, 1995.

According to Sarah Manion, President, three employees were in early at about 6:45 a.m. to start the boilers for the day's work. Shortly after entering the building they smelled smoke and vacated the building. Two fire departments answered the call almost immediately – Clarkson and nearby Leitchfield – but were unable to control the fire. They did, however, protect other nearby buildings and isolate the fire.

"There were no injuries in the blaze," said Manion, "and for that were are deeply thankful."

A great quantity of coal was stored in the building to run the boilers, and that, and some raw wax continued to burn into the next day. Insurance investigators were on the scene the next day also, as was heavy equipment to begin cleaning away the mess. Damage was estimated at about a half million dollars.

"All our wax handling and processing equipment was destroyed in the fire, as was some of the bulk wax we had stored there," said Manion.

"The building and contents were covered by insurance," Manion said, "so we will rebuild the entire facility, from the ground up.

"The goal is to be up and running by spring, but we'll see just how fast that can happen," she added.

"There is a great deal of already-prepared foundation stored in the warehouse so we'll be able to fill orders without much problem" she said. "And by spring we should be back in production."

The wax building contained many hand-made machines designed and built by Walter Kelley and his staff. It was the facility he was most proud of.

"A lot of history was lost in the fire" Manion said, "and an important part of our heritage went up in smoke.

"We will continue to fill orders without interruption. We have lots of finished product, and our biggest sales for the season are over," she added.

"Because of the timing," said Manion, "there won't be any layoffs or shutdowns because of the fire. We have so many other things going on that all our people will be busy."

The Walter T Kelley Company began in Houma, Louisiana in 1924. It was moved to Paducah, Kentucky in the mid-30s in order to be more centrally located and serve a broader area. In the early 50s it was again relocated, this time in Clarkson, Kentucky and is now in its 71st year. Sarah Manion has worked there for 23 years and succeeded Doris Pharis as President three years ago. The company employs 40 people. They are a major manufacturer and supplier of tools, equipment and supplies for the beekeeping industry, both here in the U.S. and many other countries. BC

Great Winters Come From GOOD FALL PREP

bill & mary weaver

Autumn is a hectic time for beekeepers. With honey supers to take off, extract and store, it's easy to get behind on fall bee care and go into winter with fingers crossed, hoping the bees will overwinter anyway.

Experienced beekeepers soon learn, though, that good fall bee care can pay enormous dividends in terms of low winter mortality and spring hive strength. To have strong, populous hives in the spring, ready for pollination, for splits, or for early honey flows, you need to give your hives the attention they need now, in the fall. Dr. Dewey Caron of the University of Delaware says it best: "For beekeepers, the new year begins in the fall."

The best overwintering is accomplished with healthy bees. Beekeepers need to include some medicating in their fall schedules. *Varroa* mites, which can, in time, kill a hive outright, are most effectively treated in the fall when there is little brood being reared. As long as there is brood in the hive, many of the *Varroa* mites will be in capped cells, out of reach of miticides. But as brood rearing cuts back and then ceases, the mites will be on adult bees where the miticide can contact them and do its work.

First, determine if you have *Varroa* mites. There is no point to treating them if they're not there. Your state extension specialist or inspector can tell you how to determine mite populations, either with the ether roll, the sticky paper method or by examining drone brood speared from their cells with a cappings scratcher. *Varroa* mites are oval, flattened, reddish-brown creatures about the size of a pin head.

If *Varroa* mites are found, the treatment is simple and straightforward. After honey supers are removed, treat your hives with Apistan strips, following label directions.

If you have tracheal mites in your hives (and it's probably safe to assume you do) and if you did not treat for them in the spring, fall treatment can work if you get menthol on the hives early enough.

Menthol is a fumigant. In warm temperatures, it will vaporize, and the vapors will kill the mites in the bees' tracheae. For the menthol to vaporize, the temperature at the packet (usually right above the brood nest) must be at least 60° but vaporization is much better at higher temperatures. At higher temperatures, too, Dr. Caron told us, the bees are respiring more rapidly, making treatment more effective.

The work of Maryann T Frazier at Penn State showed that fall menthol treatment in central Pennsylvania was effective if applied by September 15, but after that, the treatment was not effective because temperatures were too low for good vaporization. But menthol must be applied after honey supers are off, and many areas have a fall honey flow that ends too late for menthol to be effective. This is true of the hives we keep in the mountains of Northern Pennsylvania.

If you have this problem, you'll appreciate, as we did, the work of Dr. Keith Delaplane of the University of

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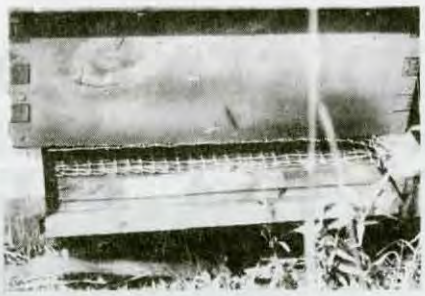
Terramycin and Fumidil are two of the mediciations needed in the fall.

Feed a thick syrup in the fall. Add Fumidil-B to the syrup.



Mouse guards of wire mesh will stop most problems. Hardware cloth in a "V" works well.

Varroa mites are susceptible this time of year. Follow label instructions.

GOOD FALL ... Cont. From Pg. 577

Georgia. His studies showed that spring, not fall, was the best time to apply menthol and grease patties for tracheal mite control. His work was done in the mountains of Northern Georgia, where, he told us, the climate is more comparable to Pennsylvania than to the South.

Other independent work as far north as Nebraska and Minnesota has confirmed the value of spring treatment for tracheal mites. In addition, Dr. Delaplane's studies showed that, when spring-applied, *either* menthol or grease patties were equally effective for knocking down tracheal mite infestation levels for a full 12 months. (The combination of menthol and grease patties, however, gave control the most quickly.)

We are planning to treat for tracheal mites this fall (since we didn't last spring), then again next spring, staying on a spring treatment schedule after that.

Many beekeepers, and we are among them, are making the decision to keep grease patties (see the April 1994 *Bee Culture* for directions) on their hives whenever honey supers are off, replacing them as they are used up. Putting terramycin in the grease patties seems to be helpful in killing harmful bacteria that the tracheal mites inject into the bees when feeding on them.

And of course, the terramycin in the grease patties is effective against the third thing beekeepers need to medicate for in the fall, American foulbrood. As every beekeeper knows, using terramycin with sugar as a powder requires visiting each hive three times at about seven-day intervals. With the terramycin in the grease patty, on the other hand, you need only one visit per hive to give you the equivalent control of not three, but five treatments of the powdered form of terramycin. The terramycin in the patty, because it is encased in grease, retains its effectiveness in the hive far longer than the powdered form.

Some of the extension specialists we spoke with recommended routinely treating hives with Fumidil-B in the fall for nosema, a widespread intestinal parasite that can shorten bees' lives by 50 percent. The parasite multiplies very rapidly when bees are confined to the hive for long periods in winter without cleansing flights.

However, when we spoke with Dr. Roger Morse of Cornell about treating for nosema, he told us that providing a good location for the bees can go a long way in preventing nosema. He told us that in a location with lots of sunshine and good air and water drainage, routine nosema treatment will likely not be needed. Nosema may still be a problem, he said, but it will be a little problem, not a big one. Conventional wisdom, however, suggests treatment.

A beekeeper overwintering bees in the North would be wise to consider carefully the suitability of his locations for wintering bees. Not all good honey-producing sites are good wintering sites. Full sun and a south-facing location with protection from winter winds are valuable because, as the sun warms the hives, the bees are encouraged to go on much-needed cleansing flights. In a sheltered location, the bees have an easier time regulating the temperature of the brood nest. Low, damp areas are generally poor wintering sites.

As you manipulate your hives in the fall to apply medications, you can determine if they have enough winter stores or if they'll need to be fed. Some beekeepers feel they must feed lightweight hives only honey, but feeding with sugar syrup is easy, effective, and economical, as long as there are some honey stores in the hive, too. Scrap sugar is inexpensive and available from many sources. Don't be put off by directions in beekeeping books telling you that sugar syrup must be mixed on the stove to get all the sugar to dissolve.

We mix our sugar syrup with hot water right out of the tap, and the sugar dissolves just fine. For fall feeding, you want a thick syrup with two parts sugar to one part water, either by weight or by volume. We use the "by-weight" method, weighing out the sugar and hot water on an old scale before mixing them in a bucket. We use hands to mix and arms to stir, which seems more effective than a long-handled spoon. After several stirrings, no more sugar settles out, indicating that it is thoroughly dissolved.

Use a 4d nail to punch a half-dozen or so holes in the lid of a gallon jar. With the right-sized holes, when

the jar is inverted over the top bars or over the hole in the inner cover, the bees can take the syrup in an orderly fashion, store it and remove some of the moisture, making it ready for winter use. Put an empty hive body over the syrup jar.

Start feeding a week or two after the first killing frost. Earlier feeding can stimulate brood rearing you don't want at this time of year. But don't wait too long. Temperatures need to be warm enough so the bees can move around in the hive to distribute the syrup.

In September or October, as you medicate your hives and check their stores, do a final check for disease and for the queen's brood pattern. If the brood pattern indicates a failing queen, this is not too late to remedy the situation by requeening. Of course, some races of bees have already quit brood rearing, so be aware of that, too.

Hives that are weak in September or October should be combined. Put the weaker of the hives on top of the stronger one, separated by a sheet of newspaper with several slits started in it. The newspaper will separate the two hives and prevent fighting until, by the time the bees have chewed through the paper, the odors of the two have become similar, and the hives will combine peacefully.

But don't be too quick to combine. Some "tender loving care" can get weak hives through the winter, if you feel like going to the trouble. We bring the weak hives from our outyards home to an unusually well-sheltered and protected, south-facing spot right behind our honey house. There, right next to the house, we can keep a close eye on them. We've gotten some surprisingly small hives through the winter there.

We even enjoy overwintering a few small hives in nuc boxes each year. We give them a second story in a nuc box, and with extra care and feeding, come spring, they're building up nicely, ready to be put in a hive body to continue to build up for spring pollination.

So that rain and melting snow run off the bottom board instead of collecting there and possibly icing up the entrance, we tilt each of our hives forward slightly on its stand.

It's also very important to give an upper exit to warm, moist air. As the bees consume honey in the winter, they give off quite a bit of metabolic moisture. If this moisture remains in the hive, it can mold combs and even condense on the inner cover and drip back on the cluster, making temperature regulation impossible. Bees can take a lot of cold as long as they're dry, but too much moisture kills.

To prevent a moisture buildup, use a small block of wood to prop up a corner of the inner cover slightly. Or some beekeepers drill three-eighths inch holes just below the handhold of the second hive body. This allows the moisture to escape, and also gives an upper entrance so bees can get out to take cleansing flights even when the lower entrance is blocked by snow.

To keep out mice, we use quarter inch mesh metal entrance guards.

Upper entrances and good ventilation are important for those obvious reasons.

Mice can easily chew right through wooden entrance reducers and can make a real mess in the hive, chewing comb and fouling the interior. Putting in metal entrance guards that keep mice out is well worth the trouble.

Overwintering bees is not all that hard, but there are some steps you can take now, in the fall, that can help your bees out a lot. By getting fall bee care on your schedule, you'll be giving yourself a good shot at strong hives bursting at the seams next spring, ready for pollination or to produce a bumper honey crop. BC

Bill & Mary Weaver are busy getting ready for winter from their home in Middleton, Pennsylvania. They are frequent contributors.

Olde Books

dana stahlman

Not long ago, I was reading Dr. C.C. Miller's book, *Fifty Years Among the Bees*, for the second time. Having retired to full-time beekeeping, I longed for the time to sit back and enjoy the winter season by doing some research to make me a better beekeeper – to recharge my batteries, so to speak.

Dr. C.C. Miller was a practical beekeeper who wrote "Stray Straws" for *Gleanings in Bee Culture* during the 1890s and into the early part of the 20th century. Well, here I was in my easy chair trying to digest as much as I could when I was struck by Dr. Miller's revelation that he was struggling with the difficulty of explaining what he wanted from a beekeeping system. He said, "Some of it comes from ignorance in not knowing how to do any better, some of it from changing plans constantly, and perhaps some of it from lack of energy to do everything just at the right time."

A light in this rather dim brain of mine came on as if I had been struck by lightening. This fit me perfectly! It had been written 80 years earlier and was just as true then as now. I am sure, also, that others share the same difficulty. As a result, I resolved to take a second look at some of the old bee books I have collected.

The authors of these books have made important contributions to the beekeeping industry, and it is fitting to reexamine what these pioneers of modern beekeeping have to share with us. The tie with the past is not broken, and it is refreshing to read of their methods, problems and solutions. An appreciation of modern beekeeping is realized only after understanding the trials, failures and successes of these early men and women. It is worthwhile to take a look back at authors such as Quinby, Langstroth, A.J. Cook, Doolittle, Comstock, Phillips, Lyon, Lovell, Miller, Pellett and others.

Finding old bee books can be a challenge. Libraries continually update their collections removing older books to keep up with the times. Often, pure luck is needed to locate some of these books. I have had success in locating books by calling bookstores in cities I visit. Fortunately, a number of reprints have been published so that the cost to buy these books is reasonable. However, add the name "antiquarian" or "rare" to the store name, and one can expect the price of the book to be higher. I have used the catalogue of B & K Books of Hay-on-Wye to determine the fair value of a book. I have also contacted WICWAS PRESS for help in locating some of these books.

I have found many copies of this first book in bookstores, and one would assume, due to the numbers available, that it was a major work. However, Maurice Maeterlinck's *The Life of the Bee* is interesting but not too valuable. Other references to the book call Maeterlinck the poet of beekeepers; however, I am afraid I wasn't that impressed.

This is no fault of the author because he informs readers that they will not learn therefrom how to manage a hive," but he will know more or less all that can with any certainty be known of the curious, profound and intimate side of its inhabitants."

Maeterlinck refers to bees as citizens within a city. Workers are neuters and the hive a city with an infinite number of wise laws and a startling amalgam of mystery, experience, genius, calculation, science of various industries, of certitude and prescience, of intelligent habits and curious feelings and virtues. Maeterlinck says that insects of the order hymenoptera (ants and bees), "of all the inhabitants of this globe, possess the highest degree of intellect after that of man."

One can get the general gist of this book from the following quote. "Finally, it is the spirit of the hive that fixes the hour of the great annual sacrifice to the genius of the race: the hour, that is, of the swarm; when we find a whole people, who have attained the topmost pinnacle of prosperity and power, suddenly abandoning to the generation to come their wealth and their palaces, their homes and the fruits of their labor, themselves content to encounter the hardships and perils of a new and distant country."

Maeterlinck defends the intelligence of the honey bee against what he considered an attack by Sir John Lubbock who observed and studied ants, bees and wasps. Lubbock had conducted an experiment with some bees and flies. He placed half a dozen of each in a bottle and placed the bottle on its side with the base of the bottle toward a window. In less than two minutes, the flies had found their way out of the bottle while the bees exhausted themselves flying against the glass through which the light was coming. Lubbock concluded that the flies were smarter. For whoever would care, Maeterlinck is the great defender of the honey bee's stature among God's creatures and a master at using adjectives to defend their lofty position. He reasons that the bees use reasoning. He says, "whereas the feather-brained flies, careless of logic as the enigma of crystal, disregarding the call of the light, flutter wildly hither and thither, and, meeting here the good fortune that often waits on the simple, who find salvation there where the wiser will per-

ish, necessarily end by discovering the friendly opening that restores their liberty to them."

I find Maeterlinck's desire to glorify the honey bee as scientist, chemist, architect, engineer, sculptor and almost any grand term wordy but worthwhile reading. As far as helping with beekeeping skill, it is lacking entirely, as the author warns. It was written for the general public, and if you keep that purpose in mind, then this book might be an interesting addition to your library.

Bee books have undergone an evolution over time, including more illustrations and new information. For example, I had to go back to a 1920 edition of *The ABC and XYZ of Bee Culture* and *The Hive and the Honey Bee* to find mention of Moses Quinby's contributions of the Quinby frame and hive, smoker and extractor. The latest edition of *The Hive and The Honey Bee* does not list him in its index at all.

Quinby was born in 1810 and died in 1875. According to the forword in the 1920 edition of *ABC and XYZ of Bee Culture*, "The keeping of bees in the old days was but little more than business or profession." Moses Quinby changed that in his 47 years of keeping bees. L.C. Root, in his article in the 1920 edition, calls Quinby, "The Father Of Practical Commercial Beekeeping In America." Quinby started beekeeping in 1828, and in his own words, began, "without any knowledge of the business to assist him, save a few directions about hiving, smoking them with sulphur, etc." By the 1850s, Quinby was so successful with his bees that he "broke down the honey market in New York City."

During an age when it was popular to patent hives, Quinby did not, and offered his experience and knowledge as a teacher and scientist to any and all who were interested without cost. In 1853, he published *Mysteries of Beekeeping Explained, Being a Complete Analysis of the Whole Subject.*

This certainly is a unique book. It is direct and informative. If you are interested in beekeeping prior to Langstroth and want a full appreciation of the modern beehive, then this book is a must to read. It is enjoyable reading – revealing a practical beekeeper who is not only an astute observer of the quackery of the period but also a spokesman for truth and honesty. He was remarkable for his time. He managed hives without succumbing to the common practice of using brimstone to kill his bees to gather the honey. In fact, he says, "You may rest assured that a rail is off your fence of management somewhere or the proper applications have not been made," if a person lost his stock of bees and luck is not really luck at all, but "it is his knowledge and care that render him so."

As a wise sage, he gives advice to the person about to take on the challenge of beekeeping. He was very opinionated and made a strong case against patent hives. "We have faithfully supported a host of speculators on our business for a long time; often not caring one straw about our success, after pocketing the fee of successful 'humbuggery' " In fact, he indicates that if a patent is attached to a hive, it can be assumed that something is wrong with it. It must have

Continued on Next Page

PREFACE.

One who for thirty-five consecutive years has succeeded in keeping bees, and has been able, most of that time, to count his stocks by hundreds, can hardly fail to furnish something from his experience, that will be beneficial and interesting to others; and he will doubtless be pardoned for attempting to teach those who may desire to avail themselves of his knowledge, and thus avoid the tedious process of acquiring it for themselves.

Twelve years ago the author explained some of the "Mysteries of Bee-keeping," to the public. The simple, practical and comprehensible instructions given, have met with abundant favor among old practical bee-keepers, and interested thousands who are now keeping bees with decided success.

The greater number of bees kept, the increased quantity and improved appearance of the honey in our markets, encourage the belief that many who have at present no adequate conception of the immense annual waste of this delicious production, may yet be induced to make an effort to save a still greater proportion of it. It will not be pretended that such immense numbers of bees may be kept in any particular section of the United States, as are reported to prosper in some parts of Europe, (2000 hives to the square mile,) but no one will deny that hundreds of thousands of stock might be profitably added to the present amount. It has been estimated that on an average, every acre will produce its pound of honey. New York alone contains 30,000,000 acres. Shall we suffer this enormous loss of the gifts of a beneficient Creator, without an effort to secure to ourselves and the community, so valuable and vast a treasure? All that is necessary, is sufficient encouragement and knowledge of the subject.

Enough has already been done to show that the estimate is sufficiently near the truth to be taken as a base for future calculations. An area of a few square miles in the writer's vicinity, has, in some favorable seasons, furnished for market over 20,000 lbs. surplus honey. Had a proportional quantity been collected in all other places in the United States, we could count the proceeds by millions of dollars instead of a few hundreds or thousands.

The author does not offer this improved edition because he supposes that people would be unable to keep bees without it, but with the hope that those who are already doing well, may do better. A person who wishes to make the most possible from his bees can hardly afford to dispense with the benefit of any experience that will aid him. The instructions found in the periodicals of the day are often not to be depended upon. A score of bee-keepers, each of limited experience, will give as many different methods, and an editor equally inexperienced, is usually unable to discriminate between them. The simplest directions of a reliable practical bee-keeper who studies the science with an honest enthusiasm, are invaluable to the tyro in apiarian knowledge.

To benefit the largest possible class, the author has endeavored to be practical rather than scientific, and has aimed at no elegance of style or diction, preferring that the merit of the book should lie in its simplicity and reliability.

M. QUINBY,

St. Johnsville, N. Y., April, 1865.

OLDE BOOKS ... Cont. From Pg. 581

been quite a challenge to keep bees during that time due to the promises of promoters for various patent hives. Quinby details several such patents. For example, one vendor claimed he was able to produce 63 stock (divisions) from one hive in three years with his dividing hive, and another developed an inclined bottom board designed to roll out worms. Quinby says, "I can imagine a pea rolling off such a board; but a worm is not often found in a rolling condition." I like his humor.

Quinby by nature questioned claims and statements and went about proving or disproving them. As a result, his observations make interesting subject matter. For example, some lore of that time claimed the queen was more fertile during the spring and into early summer and thus laid more eggs during that time period. Quinby, the observer and scientist, suggested that his experience and observations led him to believe that the queen was laying more as a result of the greater abundance of food. Quinby did use a glass wall observation hive to gather knowledge about bee behavior.

One can really appreciate the Langstroth hive after Quinby finishes his discussion on the art of keeping box hives. I cannot even imagine taking my beehives inside and sitting them bottom side up for better ventilation during the winter season. He warns of keeping hives too close to each other and endorses strong colonies in the fall.

Some of the practices in his day were humorous, and one might get a smile or two reading about them. One

MOSES QUINBY.

of these was to find the skull of a horse or an ox and place it as near as possible to the bees to serve as a nesting site for wrens. The wrens would be on the lookout for worms while the beekeeper was away. And in the 1853 edition, you can find the plan for building a smoker – not his later version but the one he used into the 50s. He says, "Get a tube of tin about five-eighths of an inch diameter, five or six inches in length. Make stoppers of wood to fit both ends, two and a half or three inches long. With a nail-gimlet make a hole through them lengthwise. When put together, it should be about 10 inches long. The ends may be tapered. On one end, leave a notch, that it may be held with the teeth, which is the most convenient way, as you will often want to use both hands. When ready to operate, fill the tube with tobacco, ignite it and put in the stoppers. By blowing through it you keep the tobacco burning while the smoke issues at the other end." His protection, by the way, consisted of a handkerchief thrown over his ears and the back of his head.

By 1865, Quinby had revised his book to reflect the impact of movable frames. However, he still had a resentment toward patent hives, and the Langstroth hive was a patent hive. Quinby didn't like the size of the Langstroth hive although his book now provides instructions on how to build a hive with movable comb, and in the book, he says "To the Rev. L.L. Langstroth belongs the credit of introducing to us the hive that will accomplish all these desirable results." Quinby preferred a hive with the inside measurements of 12 x 19½ inches and 12½ inches deep. This would make an eight-frame hive, and as he says, "This is the hive that I use principally, and I like it rather better than I do Mr. Langstroth's. He has fixtures about his that must be considered more ornamental than useful and for which the bees will not perform any extra labor." This 1865 revision includes more illustrations and new topics such as moving comb from box hives to frames and a section on the Italian bee.

In his writings Quinby shares his method of beekeeping for profit during the 1840s, 50s, and 60s, and we can see the movement from wooden box hives to movable frame hives and the advantages they offer. BC

Dana Stahlman is a retired teacher, former inspector, commercial beekeeper and avid book collector from Central Ohio.

THE MASTER'S TOUCH

richard bonney

Beekeeping as we know it today, with its Langstroth hives, wax foundation, smokers, honey extractors and all the other equipment that helps define the craft, has a well-recorded history. For the most part, this does not come from any individual's specific efforts to record history as such, but from a group of articulate beekeepers who were interested in telling how they did it, and how others could do it. The "modern era" of beekeeping, which started in the mid-1800s, was documented first by such men as L.L. Langstroth, Moses Quinby and A.I. Root, continuing later in the century with C.C. Miller, A.E. Alexander, W.Z. Hutchinson and others, and on until today with a proliferation of well-informed writers. As a result, we have a good idea of where we have been, which of course, is always helpful in guiding us to where we are going.

One of the insights gained from reading the works of the authors mentioned above is that although our knowledge of bees and beekeeping is ever increasing, the basics are still the basics. Langstroth, Root, Miller, or any of the others, would have little trouble stepping into a modern bee yard, or even into a modern extracting setup, and going to work.

It works the other way, too. We can still read the old books and benefit from that reading. Three of my favorite authors are mentioned above: Miller, Hutchinson and Alexander. Each was a commercial beekeeper in the late 1800s and early 1900s, wrote for one or more of the beekeeping journals of the day, and published one or more books, copies of which still can be found with varying degrees of effort.

C.C. Miller, a physician, was from Illinois. He gave up medicine early in life to become a full-time beekeeper and pursued his new calling for many years. He is probably best known today for his book *Fifty Years Among the Bees*, published in 1915. A reprint of this book was published by the Molly Yes Press in 1980.

W.Z. Hutchinson was from Michigan. In addition to being a commercial beekeeper, he was the editor of the *Beekeeper's Review*, one of several beekeeping periodicals of the day. His book *Advanced Bee Culture*, first published in 1905, is a summing-up of the best of his works from that periodical.

E.W. Alexander was the largest operator in Northeastern New York during much of his career. His book, *Alexander's Writings on Practical Bee Culture*, published in 1910, is a compilation of his articles in *Gleanings in Bee Culture* and reflected his experiences over a 40-year period. In his day, he was the only beekeeper to keep between 700 and 800 colonies in one yard in New York.

What is the point of this, you say? That was then; this is today. Well, as the seasons move along and the perpetual problems rear their heads, we look for answers. And often there is a sameness to our questions from year to year. Why are the bees not thriving? Why are they not producing honey? How can I be more successful? If we look at the literature, these are old questions, as are the answers. No doubt Miller, Hutchinson and Alexander asked these questions as they were getting started, and later answered them for others. As we ask the perennial questions, we can look at some of the answers that the masters gave at one time or another. Of course, Miller, Hutchinson and Alexander did not have to cope with parasitic mites. For now, though, let's put the mites aside. We are learning to cope with them, and those gentlemen would have learned, too.

One of the questions that pops up regularly is that of what to do with a weak colony in the spring, and one answer that we commonly hear is: give it some brood from a stronger colony. Sometimes this is the right thing to do, but first, listen to Miller.

He asks "Shall I take frames of brood from strong colonies to give to the weaklings? Not I. For the damage to the strong colonies will more than over-balance the benefit to the weaklings. If any taking from one colony to give to another is done in the spring, it will be to take from the weak and give to the not so weak. If one colony has four frames of brood and another, two, taking from the stronger frames for the weaker would leave both so weak they would not build up very rapidly, whereas taking one from the two-frame colony and giving it to the four-frame colony would make the latter build up so much faster that it could pay back with interest the borrowed frame."

Alexander has some different views on the subject, starting off with an obvious but often ignored statement. "The early spring is one of the most important seasons of the year to the honey producer, for if he neglects his bees at this time it is almost impossible for him to obtain any surplus from his early harvest. We should care for our bees so as to gain two or three weeks' time instead of losing any precious days." His first concern is that the bees are warm enough in the spring, and he explains what he does to ensure this. He then goes on to discuss what he does with weak colonies, building on the theme of warming.

"As soon as they have some uncapped brood in their hives, take them to a good strong colony; remove the cover from the stronger colony and put a queen excluder in its place. Then set the weak colony on top of the excluder and close up all the entrances, except what they have through the excluder down into the strong colony below. Leave them together in this way four or five weeks; then separate them and you will have saved yourself all worry about these weak colonies being robbed, chilled

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TOUCH ... Cont. From Pg. 583

or starved."

We have just looked briefly at two different approaches to handling weak hives in the spring, each carried out by competent, successful, commercial beekeepers of their time. Both methods worked. Does this tell us anything? One thing it begins to illustrate is the often-made statement: ask a group of five beekeepers a question and you will get back six different answers, all valid. There is something else we should never forget, though: location. Whether location was specifically a factor here for Miller and Alexander is not necessarily important. But the general idea of different methods for different locations is worth thinking about. Hutchinson had some thoughts on this:

"In my earlier beekeeping years, I was often sorely puzzled at the diametrically opposite views often expressed by the different correspondents of the bee journals. In extenuation of that state of mind, I may say that at that time, I did not dream of the wonderful differences of locality in its relation to the management of bees. I saw, measured, weighed, compared and considered all things apicultural by the standards of my own home: Genesee County, Michigan. It was not until I had seen the fields of New York, white with buckwheat, admired the luxuriance of sweet clover growth in the suburbs of Chicago, followed for miles the great irrigating ditches of Colorado, where they gave life to the royal purple of the alfalfa bloom, and climbed mountains in California, pulling myself up by grasping the sagebrush, that I fully realized the great amount of apicultural meaning stored up in that one little word: locality. The basic principles of apiculture are the same the world over; but the management must be varied according to the locality."

As has just been indirectly pointed out, locality is going to affect the volume, the flavor and the color of our specific crop. Something more basic may also be affected: the form of our crop. Will it be extracted or comb? Do we have a choice? Hutchinson has some thoughts on that: "Where the main honey flow is short, as it often is from basswood, sometimes lasting only a few days, there is not time for the bees to build combs in the sections, fill them, and cap them over, before the harvest is over and past."

Alexander had similar thoughts, stating that "There are many localities where the surplus is gathered so slowly, even in good seasons, that it is almost impossible to produce a nice quality of comb honey. There are many locations, where the surplus comes so unevenly because of the unfavorable conditions of the atmosphere, that this too, to a great extent, prevents the securing of nice comb honey."

"Someone said: 'The dead writers are remote from us because we know so much more than they did.' Precisely, and they are that which we know."

T.S. Eliot

Alexander doesn't leave us there, though. He gives us a way to have a steady harvest of comb honey even if no nectar is available for several days at a time.

"First, divide your apiary into two equal parts as to number of colonies, but have all your strongest colonies in one area and your weakest ones in another. Then run the weak colonies wholly for extracted honey and the stronger colonies for comb honey. Attach a good practicable feeder under every hive that is producing comb honey. Extract all you can from your weak colonies and feed it to those that are working in sections. Be sure to give them some every night... until the harvest is over and every section is finished in fine shape."

Well, that seems to take care of that problem, provided you recognize that in this context, weak colonies are only comparatively weak but not failing. Obviously, they must be capable of producing surplus honey. We will assume that these are the colonies you helped along in the spring using either Miller's or Alexander's approach for strengthening weak colonies. Or perhaps you used a combination of the two approaches. That would be worth considering.

At this point, we have only begun to tap the wisdom that may be found in these old books. With the winter before you, try to find copies of some of them. Read, ponder and be prepared to experiment for yourself. Always keep in mind, though, another thought from Hutchinson:

"No other man's experience is as good for you as your own. Someone else can only point the way. You must travel it yourself to really know."

The old masters have a great deal to teach us. But where did they gain their insight into bees and their behavior? Perhaps we have a clue when we consider a last thought from Hutchinson. In his chapter on Comforts and Conveniences in the Apiary, he tells us that a hammock in the shade of a tree or in the workshop is a great comfort.

What a great idea! BC

Richard Bonney is Extension Apiculturist for the state of MA, author of two books on beekeeping and a regular contributor to Bee Culture.

Boys, Bees, Pumpkins and Perennials

gwen eisenmann

The best view of St. Michael's Nursery is seen from the top of a hill called "the fort," fortified by three boys, Jim, John and Joe, 11, 8 and 7 years old respectively. The fort is just a wart of a hill scraped together when ground was leveled for a new greenhouse. Three steeply tortuous paths lead up from three directions to wooden barricades at the top. Lucky, the year-old black Labrador retriever, obediently (when leashed or tied) lies at the top "on guard." Jim is the Lieutenant General, with John as Scout and Joe as Sergeant. All three boys showed me the best path to climb with (maybe) steps in the soil. I was delighted to be invited up, but coming down, I chose a different path, though it required a little butt-sliding near the bottom.

But oh! What a view from the top! The farmhouse, the big barn, the market shed and the framework for two greenhouses to be built were visible. Most of the area around the house and yard is landscaped beds of perennials, enhanced by paths, rocks, trees and occasional benches for sitting. There is a rock-walled wishing well, and just beyond that, a little corner marked by a twisted vine and a sign that says "BIG J's." "BIG J's" is the boys' garden, four potted plants under their care.

Twelve years ago, Steve and Cathy Driscoll moved from St. Louis to Brandsville, Missouri, away down on the Arkansas border. In south central Missouri, going east and south, the rugged Ozark hills gradually give way to rolling farmland. Off the blacktop, down a gravel road, around the first bend is St. Michael's Nursery. It began with seeds nurtured on the carport and tomatoes started in the basement. At Fall Fair time, the last week in September, the market shed is busy with customers buying hardy perennials. The celebration of St. Michael's Day, or Michaelmas, on September 29, has been mostly forgotten in this country, but the Driscolls remember, and plan their Fall Fair around that time. The mythical dragon's hot breath of summer has been quelled with Michael's sword of lightning in thunder storms, and it is peaceful then. Even the fort is empty until boys tumble off the school bus and fortify themselves with cookies.

The view from the hill.

The main entrance and barn.

Joe, John, Jim and Lucky.

Steve and Cathy Driscoll

When I asked Steve why the nursery was named St. Michael's, he said he'd always liked the archangel Michael, and the name was better than "Steve's Seeds," or "Driscoll's Perennials." There was no other reason except a feeling for St. Michael, he said. But is it too far out to suppose maybe St. Michael himself had something to do with the choice of name? After all, he is an archangel, and part of his mission is at St. Michael's Nursery on a sunny afternoon.

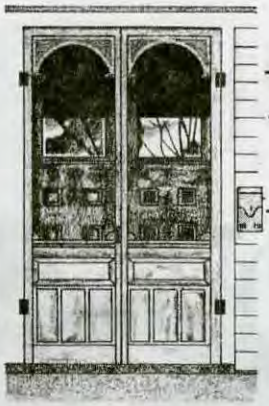
The Driscolls grow boys, bees and perennials, and pumpkins for a colorful sideline at the Fall Fair. Steve says bees naturally belong with the nursery. About three years ago Steve and a neighbor, Ed Ruther, decided to maintain some beehives in partnership. The first hive was bought from a local beekeeper and Steve acquired two more by hiving swarms from the first one. Steve and Ed had the usual ups and downs that go with learning, including a bout with American foulbrood. But the present hives are healthy, treated for *Varroa* mites, and there is honey for sale at the nursery.

When the Southwest Missouri Beekeeper's Association had their annual hive inspection and barbecue day, we met the Driscolls, and were impressed with 11-year-old Jimmy's knowledge of and enthusiastic participation in hive inspection. Jim told me he had been gifted with his coveralls, helmet and veil the year before on his 10th birthday. He wore his gear with pride and intends to earn a Boy Scout badge in beekeeping. He says it is not required for Eagle Scout status, but he wants to do it anyway.

Jimmy has already had experience in all requirements for his badge, and John says he likes bees, too. Joe and Lucky no doubt like honey, and St. Michael's mission is well on the way to being accomplished at this Ozark nursery. BC

Gwen Eisenmann is a free lance writer and beekeeper from Brixey, MO.

Three Hives of St. Michael's colonies.



HOME HARMONY

ann harman

Hazelnuts

The chilly days of October are coming to the Northwest Ð particularly to the Willamette Valley of Oregon. There the hazelnut harvest has begun. The mild weather of that area, coupled with appropriate soil, means that 99 percent of AmericaÕs hazelnuts are grown there.

The hazelnut has a long history. In 2838 B.C., the Chinese wrote that hazelnuts were one of the five sacred nourishments that God bestowed on human beings. Throughout the ages, various curative properties were attributed to the hazelnut. As a medicine it was thought to cure colds, coughs and baldness. Times have changed – we are still trying to cure colds, coughs and baldness – but not with hazelnuts. Today, we appreciate hazelnuts for the delicious flavor they impart to breads, spreads, baked goods, cereals, candy, snacks and sauces.

The hazelnut tree is a relative newcomer to our country. In Southern Europe and Turkey, the hazelnut has been grown for many centuries as a bush or a short, shrubby tree. In 1858, an English sailor, who retired to Oregon, planted the first hazelnut tree there. That one tree is not only still producing but it also contributed a piece of its wood for a gavel now used by the Nut Growers Society of Oregon, Washington and British Columbia. About 20 years after that first tree was planted a Frenchman sent to France for seeds of the thin shell variety and planted a fence-row orchard of 50 trees. The first true hazelnut orchard was started in the valley about the turn of this century. Some of the old orchards, started over 50 years ago, are still in production.

Today there are more than 1,000 hazelnut growers and processors in Oregon. Orchards cover 28,000 acres and contain over 3.6 million trees. A modern orchard in Oregon will have single-trunk trees 30 or more feet tall. The tree is slow to start producing – its commercial life does not begin until it is about six years old. However, with good management, the trees will be commercially productive for 40 or more years. In 1989, the Oregon State Legislature proclaimed the hazelnut as the Official State Nut.

Unfortunately, bees do not participate in a crop of hazelnuts. The hazelnut tree is wind-pollinated since it blooms in the middle of winter. But curiously the pollen remains dormant in the small, red, female flower until June. Then the nuts begin to form in clusters of two or three, each covered with a husk. Summer brings slowly maturing nuts which then fall to the ground in October. The actual harvesting is done by machines which sweep the nuts into windrows and then pick them up. Processing involves washing and drying the hazelnuts, then sorting for size and grading. Both shelled and unshelled nuts are inspected so that only Oregon Grade No. 1 will be shipped.

Hazelnuts certainly are nutritious. They contain no cholesterol and are very low in saturated fats and sodium. Since they are a nut, they are high in protein and fiber. They can be considered a good source of vitamin E as well as certain minerals – namely potassium, phosphorus, magnesium and calcium.

Take good care of your hazelnuts. Shelled nuts, called kernels, that are put into sealed plastic bags, can be stored in a refrigerator up to a year or in a freezer for up to two years. Let the hazelnuts come to room temperature inside the storage container before using them in a recipe.

If you purchased hazelnuts in the shell, you need to know that one pound of those will give you 1-1/2 cups whole or one cup chopped hazelnut kernels.

Hazelnuts can be substituted for other nuts in many of your favorite recipes. The Hazelnut Marketing Board recommends roasting hazelnuts before using them. In this way you will obtain the full flavor of the nuts. It is very easy to roast them: Spread shelled hazelnuts in a shallow pan; roast in a 275¡F oven for 20 to 30 minutes. The skins will crack as they roast. Now, rub the nuts while warm with a rough cloth or between your hands. If you prefer to speed up the process, use your microwave: Cook for three to four minutes on FULL power. Then you can rub off the split skins.

Now that the nuts have been roasted, you can use them in many ways. Some suggestions: Add to stir-fried vegetables and cook for one minute, use with chopped dates or raisins to put into baked apples or baked squash; use in chicken or tuna salads or in a rice or pasta salad.

Although bees did not contribute to the hazelnut supply, their honey certainly contributes to this delicious dipping sauce.

HONEY DIPPING SAUCE WITH HAZELNUTS

1/4 cup honey
1/8 cup soft butter
1/8 cup apricot nectar
1/4 teaspoon Dijon mustard
1/4 teaspoon soy sauce
chopped hazelnuts

Combine and heat all ingredients except chopped hazelnuts. Cool mixture to room temperature. Serve with barbecued pork, turkey filets or chicken wings. Dip meat into sauce, then into nuts. Preparation time 15 minutes. Makes enough for 12 chicken wings.

Creating With Oregon Hazelnuts
Hazelnut Marketing Board

HAZELNUT PIE CRUST

Now here's a recipe you may never have thought of. And is it ever good!

1-1/2 cups ground hazelnuts
3 tablespoons honey

Mix nuts and honey in a greased 9-inch pie pan. Press the mixture evenly against the bottom and sides of the pan. Fill with filling of your choice and chill.

This crust is especially good filled with fruit chiffon, lemon, cream or custard filling.

Naturally Delicious Desserts & Snacks
Faye Martin

Yes, this next recipe does call for a springform cake pan. It makes an excellent light dessert or serve it as a snack with some fruit or with just a cup of good coffee.

HAZELNUT HONEY CAKE

In this moist and delicious fatless sponge, the combination of nuts and honey gives a wonderful result. It is better still the day after baking. If you like, you can spread or sandwich it with a honey and cream cheese icing: 3-1/2 oz cream cheese beaten with 5 tablespoons honey and a little lemon juice.

7-1/2 tablespoons honey (not too thick a honey)
3 eggs, separated
1/2 cup flour
1/3 cup hazelnuts, finely ground
pinch salt

Line a 7-inch spring-form cake pan with non-stick baking paper (cooking parchment paper). Butter and flour the sides. Beat together the honey and egg yolks until thoroughly mixed, light and fluffy. Sift the flour and fold it into the eggs and honey along with the ground hazelnuts. Beat the egg whites with a pinch of salt until stiff but still creamy. Fold them into the cake mixture, then pour into the pan and bake at 350¡F for 30-35 minutes, or until golden brown, well risen and a needle inserted in the center comes out clean.

Honey From Hive To Honeypot
Sue Style

HAZELNUT BAVARIAN CREAM

Now it is time for something special –

1 tablespoon gelatin
2 tablespoons cold water
1/2 cup milk
1/4 cup honey
4 egg yolks
1/8 teaspoon salt
3/4 cup finely ground hazelnuts
1 teaspoon vanilla
1 cup whipping cream

Soak the gelatin in the cold water. Scald the milk. Beat together the honey, egg yolks and salt. Pour a little of the hot milk over the egg mixture, stir, and then add the rest gradually. Stir over – not in – boiling water until the ingredients begin to thicken. Stir in the soaked gelatin until dissolved and add the ground hazelnuts and the vanilla. Whip the cream until stiff and fold into the other ingredients. Pour into the serving dish or in a wet mold. If the Bavarian is to be served in sherbet glasses, chill 4 hours before serving. If it is to be unmolded, chill 12 hours or more. This can be served with raspberry syrup.

The Joy Of Cooking
Irma S. Rombauer &
Marion Rombauer Becker

You now have an assortment of recipes to try. If you have never used hazelnuts before, do try this wonderful nut this autumn. It's also an opportunity to use some of your own honey.

DON'T ABUSE APISTAN

FOLLOW THE LABEL – AND COMMON SENSE – OR ELSE!

james bach

Apistan, a plastic strip containing fluvalinate, is being widely used for the survey and control of *Varroa* mites. Because of the cost of the strips, beekeepers have been trying to find ways to reuse or modify them to prolong their useful life and reduce their *Varroa* costs. Reports of this activity have been circulating within the industry for several years.

According to these reports, many beekeepers have made attempts to use this product in ways not in accordance with the product label. Below are common samples of beekeepers' violations.

1. A beekeeper might lay one or more strips horizontally at the hive entrance. This procedure limits the chemical dispersal to those bees that walk over of the strip(s) as they enter the hive. Those going up the inside of the hive front do not contact the strips at all. Also, the strips are only being contacted by the bees when they leave or enter the hive, or about eight to 10 hours per day. Thus, the amount of surface area contacted by the bees, and the length of time the bees are actually walking over the strip surface, is greatly reduced from that required by the label to properly kill mites.

2. Some lay a strip, or two, horizontally in the bee space between the two brood nest boxes. This use greatly reduces the amount of strip surface area available to the bees (50 percent?). The contact surface is limited to the space between the top bars and between the bottom bars. Bees also travel stain, propolize and wax these strips more than they do properly hung strips thus further reducing the amount of available chemical.

3. Others use the strip(s) for 60 days and then place a used strip and one new sting in hives for subsequent treatments of 10 to 20 combs of bees.

4. Still others use only two strips per colony of 15 to 20 combs of bees in the fall instead of the label recommendation of one strip for each five combs of bees. Experience verifies that this constitutes a half treatment of the colony, somewhat dependant on the cluster size.

5. Beekeepers leave the strips in the hive all winter and some for the whole year.

6. Beekeepers may also use an electric wire wheel or other device to scarify the surface of the strip to reveal more fluvalinate.

By using Apistan as suggested in the first two examples above, the amount of chemical distributed in the colony is reduced because the amount of surface area in contact with the bees, as recommended by the label, is not met. The next two result in under-treatment of mites, the possibility of resistance buildup and less than ideal mite control. Reduced dosages of chemical in the presence of a pest enhance the opportunity for the pest to develop a tolerance for the active ingredient in the chemical, normally referred to as resistance. The last two result in significantly reduced chemical treatment of mites as indicated by laboratory tests described below.

Beekeepers who use one new and one used Apistan strip claim success based upon the claim that "the colonies look good." I suggest that this is not an adequate success indicator because many of these people lost colonies due to *Varroa*. Some of these used all new strips the next year and found that many more colonies survived. Test and control colonies must be used to achieve measurable results of success. Many things cause colonies to "look good" or "look bad." All of these causes must be considered in any evaluation procedure.

From my discussions with Zoecon laboratory personnel during their development of the Apistan strip, I learned that the chemical "does not migrate to the surface" of the strip as bees remove the surface chemical. The chemical is caught within the plastic matrix during manufacture and only that on the strip surface is available to the bees. This suggests that the strips are only useful as long as chemical remains on their surface.

To determine the useful life of Apistan strips, I had our laboratory conduct some tests. Technicians used commercially available alcohol swabs to wipe both surfaces of groups of 10 strips to remove the fluvalinate. Group one consisted of 10 new strips from a newly opened package of 100 strips. Used strips were selected randomly from those used by two beekeepers to treat 36 and 150 colonies. Three to four strips had been used in each of these colonies consisting of 12 to 20 combs of bees. The 10 visibly clean strips showed no signs of surface contamination with wax, propolis or bee travel stain. Ten strips were wire brushed using an electric motor with mounted wire wheel. The brushing removed all surface polish from the strips suggesting that the surface layer of the strip had been scarified or removed. A Stanley Surform plane was used five times on each side of 10 strips, which removed thin layers of plastic from all areas of the strip surface. In all, seven groups of 10, for a total of 70 strips were tested.

The amount of chemical collected on the swabs from the surface of the strips was measured, and the results given in micrograms per strip as follows.

- New Apistan strips from a new package: 809 micrograms. (100%)
- Visibly clean strips after 45 day use: 201 micrograms. (24.8%)
- Visibly slightly contaminated strips after 45 days use: 142 micrograms. (17.6%)
- After 45-day use, brushed with electric wire wheel:

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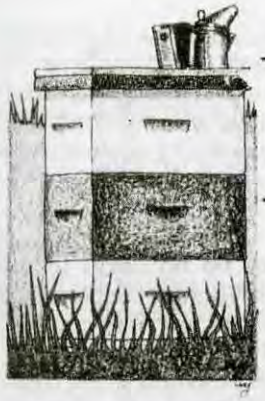

BEE TALK

richard taylor

"The riches of the world are at your doorstep."

Do you keep a diary or journal? A beekeeper sometimes has lots to write about. I don't mean just the usual things - when nectar sources bloom, the big swarm you gather, what the scale hive did, that sort of thing. Sometimes it's worth recording what the day's, or week's, events meant to you.

Here, anyway, I'm going to share, for whatever it might be worth, what a few days last summer meant to me.

I begin with July 24, a few days before we were to go off to Vermont to see the beekeepers there and to join briefly in the birthday celebration for Charles Mraz as he turned 90 and, as my kids remarked later, looked about half that.

I went off to one of my bee yards that day, curious to see whether the bees had done anything yet in the comb honey supers I had given them about a week earlier – I'm not sure just when, but it hadn't been long. I thought maybe they might be well underway, maybe even half full. Well! I found them all filled right up full, even into the corners, with about the most beautiful comb honey I have ever seen! I was dumbfounded. The bees constantly dumbfound me. I knew I had better get it harvested and give the bees some new supers to work on before going off to Vermont.

So I got the new supers ready and went over the next day with the escape screens. It was not a very promising day for prying supers up. It had rained, the bees had nothing to do, so they were clustered deep on the fronts of the hives – not, I was sure, in a very good mood. They get cross when they have nothing to do. What a sight! That apiary sits in the midst of a sea of knapweed. I was wishing I could take a picture of the thousands of lavender blooms, with my beehives in the background. Utterly beautiful! But, ominously, there was not a single bee on those blooms. The rain had washed away all the nectar. So I went to work, and it went quickly, but the bees soon let me know what they thought of my intrusion. I got stung up pretty bad, right through the bee suit. One bee, somehow, got into the leg of my pants – a condition that upsets even the most toughened old beekeeper like me. And you can't do much about that, what with veil and gloves on, because if you take off your gloves to get yourself unzipped and get her out of there, you not only risk stings on the hands, but maybe a couple more bees flying into the opened zipper! And there's not much chance that you are going to get that bee out of there before it is too late anyway. Still, you've got to try or become completely unnerved. I got my gloves off and clumsily raced against the bee, and time. But I lost.

So, back on with the gloves, and back to work. I reminded myself that stings are probably not only a good way to forestall arthritis, but they are also (I tell myself) good for strengthening character.

I survived, of course. It is not the first time this has happened, nor, probably, will it be the last.

A couple days later, I headed back there to harvest the supers, and as I drove along, I had the overwhelming feeling of total happiness. I always do, driving off to one of my bee yards. A few stings have no effect upon this.

Now the sun was out, and the day was hot. Bees covered the knapweed blooms, and it was no trouble taking the supers. So I checked a few more hives to see if the bees were putting any honey in those supers, and lo! These supers were filled up full, too, corners and all! And the broken burr comb, as I pried up the supers, disclosed thick, water-white honey, just what the bees get from the knapweed. That was something sorely we needed at the end of a season when the honey, not only here but throughout the East, had been dark - an effect of the drought, no doubt. So more supers were going to be needed, but these would have to wait until I got back from Vermont.

I had remembered, on this trip to my bee yard, to bring a bucket along to gather the blackberries that grow in abundance right behind my hives, next to the acres of knapweed. They didn't really belong to me, but no one else was going to pick them, not with those cross bees only a few feet away.

Happiness, I got to thinking as I drove back home, is composed mostly of small, quiet joys. We all hope for the great triumph, the sudden fortune, long sought and finally won, but this is not what gives life its meaning. It is the little things, often unexpected, casually and effortlessly found – the bright lavender of the knapweed blooms under the cloud-covered sky, the bluebirds nesting in the box you set out near your kitchen, the sound of a baby's laugh, an affectionate note from some unexpected source, the sun rising through the morning mist with a drama that always astonishes, waking up in the arms of your beloved, to realize that joy penetrates even into your sleep.

These are the kinds of things that carry us from day to day, not caring about the passage of the precious time. If you set your eye only on the great things, the large goals of long struggle, the thunderclap of achievement, then fulfillment will elude you always. Its ingredients are not in some distant time or far away. Power and glory are not suitable objects of envy. The riches of the world are at your doorstep and in the simplicity of an unencumbered life. BC

Richard Taylor raises bees, and comb honey, and writes beekeeping books from his home near Interlaken, NY.

Questions?

Goldenrod or Asters

Q Does the yeasty scent of apiaries in October come from goldenrod nectar, or is it from the asters?

K. G. Pipes
Snow Camp, NC

A Mr. Pipes raised this question to me several months ago and supplied what he believes is the correct answer. The vast majority of beekeepers believe that this strong, pungent odor, often detectable several hundred feet from the hives, comes from the goldenrods, but Mr. Pipes notes (1) that in his area, it is very easy to tell exactly when a honey flow begins by the suddenly increased activity of the bees; (2) that a strong honey flow always begins just as the asters begin to bloom; (3) that it is accompanied by this characteristic strong scent; and (4) that the goldenrods have already been in bloom for several weeks when this happens. This is a strong argument for the asters, but I think it is consistent with the goldenrod view because (1) there are many species of goldenrod, all of the same characteristic color but still quite different, and it is possible that only the later ones produce nectar flows; (2) there is a delay between the time nectar is gathered and when it finds its way to the supers as honey; and (3) the amber color of the honey, plus the golden color of the cappings, quite irresistably suggest goldenrod. Of course, this may just be association. I personally cannot help thinking that this scented nectar comes from goldenrod, but that may be just because I am old and set in my ways. I should add, incidentally, that this annual October scent in the apiary differs greatly in different parts of the country. Here it is very pleasant, but in New England it can be quite foul.

Yellow Jacket Blues

Q Yellow jackets are a great pest in my apiary, attacking the bees at the entrance and sometimes dragging them away and killing them. I swat a lot of them but more keep returning. Do these have a serious impact on the bees?

George Piper
Torrington, CT

A The yellow jacket population explodes in August and September; they become very aggressive in the competition for food, and then they disappear with the first frosts. I am quite sure they have no significant effect on honey production, but they can be a real nuisance in the honey house. Here they can be gotten rid of by hanging a can with about a quarter-inch of kerosene or soapy water under a light bulb which is left on all night.

Wet Supers

Q What is the best way to clean wet supers without causing robbing?

George Babcock
Morrisville, VT

A I stack sticky supers out in my yard, not far from my home apiary, in late summer or fall at a time when there is not much nectar in the fields. This causes a feeding frenzy, and a few bees perish in the tumult, but everything gets nice and dry. I am absolutely convinced that disease is not spread by this procedure, contrary to what some have claimed.

Using Apistan

Q Why do directions for Apistan strips say to leave them in the hive no longer than 45 days? Are they harmful to the bees if left longer?

Robert Hunting
Orono, ME

A No, they do no harm to the bees, but there is concern that if the strips are not removed, then this will encourage the development of mites resistant to the treatment. Some beekeepers routinely leave the strips in all Winter, which is not a good idea.

Editor's Note: For a thorough discussion of Apistan use, see the article on page 590.

Controlling *Varroa*

Q What is the better way to control *Varroa* Apistan strips or resistant bees?

Lucian W. Barnes
Lexington, KY

A Our best hope for the future is certainly resistant bees, but I think no such strain of bees exists today, notwithstanding claims to the contrary by bee breeders. Some bees show a degree of resistance, but it is, I think, not sufficient to rely upon. Until truly resistant bees are available, we shall probably have to depend on Apistan, which works. Directions come with the product.

Winter Ventilation

Q If I put a quarter-inch piece of lathe on the top of the front edge of the inner cover of my hive, thus creating a long pie-shaped crack along both sides under the telescoping cover, will that create too much ventilation for wintering?

Todd Farmer
Williamsport, MD

A I think so. The bees do not need much air circulating through the hive in winter. What they do need is some way for moisture to escape. Bees give off a lot of moisture, and if this condenses, and even freezes under the inner cover, then drips on the cluster, it creates considerable stress. Leaving the inner cover hole partly open

seems to be sufficient, assuming the telescoping cover does not fit too tight. Otherwise, a tiny crack created anywhere near the top of the hive will allow moisture to escape.

Inside Bees

Q I would like to get my bees out of the way of children and livestock by putting them inside my hayloft this winter with an outside entrance. Would there be any problem with this?

Timothy Queeno
Lima, NY

A There is nothing wrong with that idea, but it should not be necessary to go to such lengths just to protect children and animals from stings. Bees seldom attack livestock, and putting hives behind shrubbery or a similar obstruction should be enough to protect nearby children. If you put them inside a building, you should be sure there is ample light inside to enable you to inspect them, and also, an open window to liberate bees that are inside the building after you have closed the hive.

Winter Prep

Q Can you advise me how to treat my hives for winter? Should I take the hives apart and look for disease? What do you do?

Ralph Schofield
Rockland, MA

A There is certainly no need to take them apart, but I think you should assume that *Varroa* mites are present. What I do is (1) put Apistan strips in each hive, following directions; (2) leave the inner cover hole open a bit to let moisture escape; (3) insert a wedge of hardware screen in each entrance to keep mice out; (4) slap a scrap of tarpaper loosely across the entrance to keep wind out, fastening it with a couple of staples or thumbtacks; and (5) tip each hive forward slightly. This whole procedure takes only a couple of minutes.

Editor's Note: There are other precautions to consider that are covered in the 'Fall Prep' article in this issue.

Readers please note: Questions are welcomed, and should be sent to Dr. Richard Taylor, Box 352, Interlaken, New York 14847 NOT TO MEDINA. Questions not accompanied by a stamped, addressed envelope will not receive a direct response.

Answers!

Richard Taylor

APISTAN ... Cont. From Pg. 590

110 micrograms. (13.6%)

- After 45-day use, planed by making five passes on each side of the strip with a Stanley Surform flat plane: 70 micrograms. (8.7%)
- After 60-day use: 30 micrograms. (3.7%)
- After six-month use (Oct '94 - April '95): 38 micrograms. (4.7%)

Based upon these laboratory results, I think it is safe to deduce the following:

Apistan strips used as in examples five and six above do not adequately treat *Varroa*.

The low levels of available fluvalinate may suggest a basis for the development of chemical tolerance by *Varroa*.

Fluvalinate may only be distributed in the surface of the plastic matrix during manufacture and not throughout it. Theoretically, if the chemical is distributed throughout the strip, the planing should have uncovered higher levels of fluvalinate.

The 45-day use recommended on the Apistan label is probably the maximum effective use period of the strip, even though some verbal reports suggest that some mites may fall to the bottom board if the strips are used for a longer period.

Research conducted by Zoecon indicates that about 98 percent of the mites will be killed with a 45-day treatment period and 99.5 percent with a 60-day treatment. This may be reflected in the above laboratory data.

Given all that I have heard and read, it appears that the best control of *Varroa* may be gained by using one Apistan strip for each five combs covered with bees, for a 45-day period. Beekeepers should remove the strips after 45 days. For practical reasons, most beekeepers may not make a special trip to the apiary but will remove the strips on their next bee management visit.

The apiculture industry cannot afford the loss of Apistan. We can lose the chemical in at least two ways. The manufacturer has let it be known that if beekeepers continue to misuse the chemical, it may be removed from the market. And we may, or will over time, lose the product if it no longer controls *Varroa*. It is therefore prudent to use the product according to the directions on its label for maximum efficiency and effectiveness.

Meantime, queen breeders should be encouraged to continue their efforts to select lines of bees having the maximum number of desirable qualities including honey bee tracheal and *Varroa* mite resistance, without the use of chemicals. BC

Acknowledgements: Thanks to Walt Peterson, Inland Empire Beekeepers Association, for suggesting the idea of testing the reconditioned Apistan strips. To Jean Bassett, The Beez Neez Apiary Supply, and Ron Babcock for supplying used Apistan strips for these tests. Also, Herman Moya, Chief Chemist of the Washington State Department of Agriculture Chemical Laboratory, for conducting the tests.

Jim Bach is the State Apiary Inspector for the state of Washington.

?Do You Know? Answers

1. **True** Both nectar and honeydew are collected by the honey bee, processed and stored as honey in the comb. They are both mainly composed of sugar, but they also contain very small quantities of proteins, vitamins, minerals and a number of other substances. When they are used for food the bees have to dilute them again.
2. **False** The amount of pollen collected by a colony depends upon the colony's immediate requirements, and there is a correlation between the amount of brood present in a colony and the amount of pollen collected. Using a pollen trap on a colony will increase the number of bees collecting pollen in the short term, as the colony tries to compensate for the reduced amount of pollen arriving into the brood nest.
3. **True** Pollen is considered viable while it retains its ability to germinate. The longevity of pollen varies greatly between different plant species. Once it is packed into pellets and removed from the bees' legs, it loses its ability to germinate fairly rapidly. The reason for this loss in viability is not fully understood, but may come about as a result of some addition, honey or enzyme, made to the pollen by the bees during the packing process. Because of this, pollen sold to be used in pollen dispensers for cross-pollination is hand-collected.
4. **False** Sucrose, fructose and glucose are the main sugars found in nectar. In addition to these three sugars, a-methyl glucoside, maltose, trehalose and melezitose are also of nutritional value to bees. Most other sugars neither taste sweet nor have nutritional value. Some sugars, such as mannose, glactose and rhamnose, are either toxic to bees or cause reductions in their longevity.
5. **False** The average nectar load weighs 40 mg although some nectar loads may weigh up to 70 mg. Pollen loads have an average weight of about 15 mg, and they are limited by bulk rather than by weight.
6. **True** Once pollen has been brought back to the colony by foragers, the workers treat it to prevent germination, begin the digestive process, and prepare it for long-term storage. A phytocidal acid which prevents germination and deleterious bacterial activity is added when pollen is packed into the comb.
7. **True** A bee will remain consistant, often for several consecutive trips, collecting nectar only, pollen only or both. The purpose of the trip is determined before the bee leaves the hive; foragers collecting only pollen take sufficient honey from the hive to provide them with energy during the trip.
8. **True** Pollen digestion provides challenges to both larvae and adults because of the hard and undigestible pollen wall components. When ingested, pollen is quickly passed through the honey stomach to the midgut, where digestion takes place. Once in the midgut, the enzyme-secreting membranes tighten around the pollen bolus. The digestion of usable pollen nutrients takes place either through the pollen germination pores or through the pollen wall. The pollen grains are empty by the time they appear in the rectum.
9. **True** Weather and other environmental factors influence nectar and pollen foraging activity as well as availability. Time of day can also influence flight patterns. The genetic basis for the collection and storage of nectar and pollen has been shown by demonstrating variability in these factors between colonies and then successfully selecting colonies for low and high hoarding characteristics.
10. B) Honey Stomach (Crop)
11. E) Proventriculus
12. B) Ventricular Wall
13. Provides the bee with energy to power its bodily functions.
    Used to produce heat to keep the colony warm.
    Raw material for the formation of chitin, the structural substance of the exoskeleton.
    Secretion of beeswax for the construction of comb.
14. Proteins (Amino Acids)
    Minerals
    Lipids (Fats)
    Vitamins
15. Foragers will clean themselves and discard this pollen in flight.
16. Location of the sun, perception of polarized light patterns, landmarks and the earth's magnetic field.
17. Invertase breaks down the sugar **sucrose** into **glucose (dextrose)** and **fructose (levulose)**.
18. The phrase "scrabbling" for pollen implies that the honey bee is shaking, biting and crawling over the anthers to release the pollen so that its body becomes covered with it.

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

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

Gleanings

OCTOBER, 1995 • ALL THE NEWS THAT FITS

Bee Haulers Included

AG CARRIERS UNITE

A group of agricultural haulers plans to form a national conference affiliated with American Trucking Associations, according to ATA. The carriers met with ATA officials in Denver June 7 to discuss the alliance.

The effort is being spearheaded by Bud Wallace, president of Wallace Transport, Planada, CA. He is chairman of the steering committee set up to establish the organization.

Mr. Wallace and others contacted ATA officials in February to explore the feasibility of creating a conference that would unite transporters of agricultural commodities, livestock (including honey bees) and forest products.

"This is one of the largest remaining segments of the industry without a national voice," said Paul T. Stalknecht, ATA senior vice president of federation relations. "And they have unique problems."

The carriers were spurred in part by changes to California's hours-of-service laws that cut the number of hours their drivers could operate, Mr. Stalknecht said.

"These carriers get caught in a crunch when all their produce comes to harvest at the same time. There are just not enough trucks or people available at times to get the goods from the field to distribution points."

The carriers would like to see a 24-hour "restart" provision that wipes a driver's logbook clean after a 24-hour rest period.

At the meeting in Denver, Mr. Wallace identified other issues that concern agricultural haulers. They include:

- Federal equipment and safety regulations.
- Driver standards, especially differences among state laws and agricultural exemptions.
- The driver shortage.
- Equipment standards and size and weight regulations.
- Hazardous materials regulations.
- Storm-water runoff rules and the Clean Water Act.
- Load securement rules.
- Enforcement quality and consistency in state vehicle inspections.
- Labor laws.
- Standardization of federal drug and alcohol testing rules.
- Commercial driver licensing.
- Taxation issues that apply to offroad operations.
- Environmental Protection Agency and Occupational Safety and Health Administration regulations.

The new conferences held its first organizational meeting Sept. 27 at the Hyatt Regency Airport Hotel in Dallas, near the Dallas-Fort Worth Airport. Those interested in information should contact Mr. Stalknecht at ATA in Alexandria, VA, 703-838-1803.

BOY SCOUTS KILL BEEKEEPING BADGE

On August 21, 1995, the National headquarters for the Boy Scouts of America confirmed that Beekeeping Merit Badge will be discontinued as of September 1, 1995. Any Boy Scout who has begun the merit badge before that day has until his 18th birthday to complete it.

Beekeepers, all association leaders, scouts who earned or are earning Beekeeping MB, and to the Scout leaders of those scouts, are urged you to write to the address below, explaining the value of this merit badge to you, what you are doing to help scouts achieve this MB and what you will do to keep it going.

In the October, 1994, *Bee Culture*, Dr. Dewey Caron described the Delaware Beekeepers Association program to train scouts in beekeeping. Maryland State Beekeepers Assoc. followed in their footsteps this year. Any beekeeping association can do the same! You do not have to be big,

Continued on Next Page

Dr. Rob Page Reports

AHB IN CALIFORNIA

Africanized honey bees (AHB continue their invasion of California with a total of nine colonies detected since the AHB was first detected October 24, 1994. The bees' progress is being closely monitored by UC Davis entomologist Dr. Robert Page, who file the following report.

Each of the colonies detected so far have been determined to be Africanized on the basis of the USDA-ID morphometric method that analyzes 21 different size and body part characteristics. In addition, the California Department of Food and Agriculture (CDFA) pest diagnostic developed in my laboratory by Dr. Paul Ebert is used. They found that all of these colonies had African-type mitochondria. The mitochondria in honey bees (and humans) is inherited only from the mother, therefore, these results demonstrate that the AHB arriving in California are part of a very long maternal line that extends relatively unchanged back to the original introduction of African bees into Brazil in 1956.

Two years ago, Africanized bees were found on the southern and eastern borders of California. I believed at that time that their entry into California was inevitable and had probably already occurred. My hypothesis was that they would increase in density in that area until they were numerous enough to be captured in a trap or cause some kind of problem in an inhabited area. The repeated finds of AHB in the Imperial Valley this spring stimulated me to sample bees from that region in order to determine their distribution and relative abundance.

The standard USDA-ID method requires sampling 10 bees from a single colony. Feral colonies are not easily found unless they fly into traps or are a nuisance to someone, so the morphometric method is not good to use as a random survey tool. Mitochondrial DNA analyses, however, can be made on single bees. Therefore, an area survey is possible by simply catching bees on flowers, then determining their mitochondrial type. If AHB are abundant in an area, relative to European bees, then there should be an abundance of mitochondrial types in the sample.

On April 13-15, I (along with my 11-year-old son Brian) collected 75 bees from 31 collections sites located in the Imperial Valley and near Blythe. We tried to make collections in areas where bees were likely to be feral, although there is no way to tell where the bees came from. Mitochondrial DNA diagnostics were run on these bees and we did not find any mitochondrial types that are indicative of AHB. I interpret these results to suggest that AHB are not yet abundant in these areas.

My original hypothesis was probably wrong. AHB have not been in California for two years; it is likely that we are truly seeing the very early stages of the "invasion" of Africanized bees. The current methods of sampling used by the CDGA – trap lines and reports from concerned citizens – are better than random sampling methods for early detection of rare Africanized colonies. However, the method of randomly sampling bees and checking their mitochondrial DNA will be the best indicator of the extent of "Africanization" in an area.

Why it has taken them so long to move into California and why they are spreading slowly remains a mystery. Genetic mixing with commercial bees does not seem to be the answer because the colonies that have been detected have been highly Africanized both in morphometric characters and mitochondrial DNA. Only time will tell to what extent they will spread and how abundant they will become. But, for now, they have not made a detectable impact, even in the Imperial Valley.

From CA Almond News, August issue

SCOUTS ... Cont. From Pg. 595

or rich, or state-wide. If you offer a short or beginner's beekeeping course then you have what you need to teach the merit badge. This is what you need to do.

Register as a beekeeper merit badge counselor with your local BSA Council.

Go to the "Roundtable" meeting for the District(s) you can best work with and announce your program and invite the Scouts.

Keep the cost down.

Follow-up after the class by working with the Scouts to finish the requirements.

The merit badge book does not specify that the Scout has to keep the bees himself.

All this is moot if the decision is not reversed. Getting Scouts involved in beekeeping is one way to increase your membership by getting them (and their parents) interested in beekeeping. Follow up on any scout who expresses interest in beekeeping. Help them along. A Scout might take this up as a hobby now, or later as an adult. Maryland's own extension apiculturist, Dr. Gordon Allen-Wardell, started with Beekeeping MB at age 14. He got Dr. George Ayers interested in bees and their forage plants. The ripples can go a long way.

Girl Scouts can also qualify for Beekeeping merit badge as long as the Boy Scouts offer it. The Girl Scouts do not offer their own Beekeeping achievement badge, and when they do not offer an equivalent badge, they can work on the Boy Scout badge. Include them; don't overlook them.

Don't hesitate. Pledge to hold a Beekeeping MB program next spring. Write to Mr. John Dalrymple, Director, Advancement/NESA, Boy Scouts of America, P.O. Box 152079, Irving, TX 75015-2079. Inform the BSA that you will do so. Let them know how important this is to us and to scouting.

OBITUARY – John Lindner

John Vincent Lindner, 78, of 188 North Centre Street, Cumberland, Maryland, died Monday, July 24, 1995, at his home.

Born February 27, 1917, in Cumberland, he was the son of the late John H. Lindner, a pioneer in Maryland beekeeping, and Teresa L. Lindner.

John was inspired by his father's interest in the beekeeping industry and became a regional authority for beekeepers. He started keeping bees early in life and continued working with them for almost 70 years. At one time he maintained over 1,000 colonies for honey production and pollination.

Mr. Lindner worked as an apiary inspector for 30 years. In addition to keeping bees commercially, he began inspecting bees as a regional part-time apiary inspector for the State of Maryland in 1949, and sold most of his colonies in 1967 when he became Maryland's first full-time apiary inspector. Mr. Lindner faithfully served the beekeepers of Maryland as chief inspector for 12 years until his retirement in March, 1979. During his tenure, Mr. Lindner instituted an annual apiary inspector's workshop where inspectors from Maryland and surrounding states received training in all phases of bee diseases and the beekeeping industry. He also assisted researchers at the USDA Bee Research Laboratory on various projects. In 1973, Maryland beekeepers began saving diseased bee equipment by having contaminated items fumigated with ethylene oxide. This continued on a limited basis until 1978 when the Maryland Department of Agriculture, through Mr. Lindner's efforts, purchased a portable ethylene oxide fumigation chamber.

Lindner was a member and director of the Eastern Apicultural Society, a member of the American Beekeeping Federation, and active in the Eastern Beekeepers Pollination Association which he helped form in 1969. He exhibited honey, served as superintendent of the honey department, and judged honey at the Maryland State Fair over a 50 year period. Mr. Lindner was a past president of the Maryland State Beekeepers Association and past president of the Allegany County Beekeepers Association.

John Lindner will be missed by his wife Alberta Lindner, a large family, and many friends and beekeepers in Maryland and around the country.

'95 FARM BILL CHANGES

While the details of the 1995 Farm Bill won't be known well into fall, it's likely that the legislation will represent a dramatic change from past policy, says an Ohio State University agricultural economist. More than in any other year, the bill will be driven by budget concerns, he says.

"There will be less tolerance of smoke-and-mirror techniques that appear to cut spending, but actually have little impact," Carl Zulauf says. "The implication is that farm spending will be cut, and the cuts will be real and significant."

Farmers should expect an increase in planting flexibility and a decrease or elimination of income supports, Zulauf says.

A sense of optimism over increased exports to Asia has made it easier to argue that income supports can be eliminated or reduced, especially if they are phased out over many years and the larger cuts are held off until the later years, he says.

Farmers could find set aside programs minimized or eliminated as well, Zulauf says. Agri-businesses have persuasively argued that taking U.S. land out of production reduces employment here and helps global competitors.

However, farmers could see some sort of farm income safety net included in the legislation, Zulauf says. While the form is unclear, leading candidates include subsidized crop insurance, a marketing loan with loan rates tied to a moving average of past prices or a revenue insurance program that combines price and yield risk, he says.

Environmental concerns will continue to weigh heavily in farm bill debate, Zulauf says.

While some in the farm community believe that the 1994 Republican landslide means environmental restrictions on agriculture will be reduced, "There is no talk of eliminating conservation compliance, conservation reserve, wetland provisions, and sodbuster provisions," he says. "The wetlands provisions will probably be weakened, but the basic environmental thrust that emerged in the 1985 farm bill will largely remain intact."

However, in the words of Bob Dylan, "Change is in the wind," Zulauf says. The new farm bill could have a bigger impact on farming than any farm bill in recent memory.

"Farmers and agribusinesses should carefully evaluate what the forthcoming policy decisions will mean to them," he says.

"Short of an economic depression in the U.S. or a major shift in the Chinese government back to self-sufficiency and Maoism, nothing else is likely to have a greater impact on which farmers and agribusinesss will be in business during the early 21st Century than how they handle the changes enacted in the 1995 farm bill," he says.

ROBINSON RECEIVES GRANT

Gene Robinson, associate professor in the Dept. of Entomology, University of IL, has been awarded a Fulbright grant to study molecular behavior genetics in honey bees at Hebrew University. Robinson is one of approximately 2,000 U.S. grantees who will travel abroad for the 1995-1996 academic year under the Fulbright program. Established in 1946 under Congressional legislation introduced by former Senator J. William Fulbright of AR, the program is designed "to increase mutual understanding between the people of the U.S. and people of other countries."

AAPA ON THE WEB

For 10 years the American Association of Professional Apiculturists has united professionals in research, extension and regulations to better serve the science and industry of U.S. apiculture. It's had a checkered career, though, being much less active during some periods than in others. Now it is standing on the brink of a new era of activity.

Marion Ellis, of the Univ. of NE, has formed an internal review committee to evaluate the purpose and future activities of the group. The committee has carefully considered some important questions, and made recommendations at the combined meeting of AAPA and the American Bee Research Conference in Sept.

The current issue and all subsequent issues of the AAPA newsletter will be available from September 1 on the University of Nebraska World Wide Web pages (http://ianrwww.unl.edu/ianr/entomol/entdept.html).

Send Us Your Meeting Notices Two Months In Advance

Display Index

Things To Learn From Bees

howard scott

Every decade has its book of simple wisdoms. In the 70s, Robert Pirsig's *Zen and the Art of Motorcycle Maintenance* became an indispensable handbook. The 80s saw Robert Fulghum's *All I Really Need to Know, I Learned in Kindergarten* rise to best-selling stardom. I have in front of me the 90s offering: *Life's Little Instruction Book*, which offers 108 guides to living sensibly. Well, how about Bee Homilies? Can we learn anything from the bees that we can apply to our lives? Okay, here goes:

♥ Little drops add up to great stores.

♥ One who only loafs and eats makes many enemies.

♥ When love calls, it's not always best to arrive first.

♥ Leave it to mother nature to provide the best and the healthiest nourishment. Only fools eat junk food.

♥ When the sun is shining it's time to make hay.

♥ When you are the queen, you can't sit around resting on your laurels.

♥ Often it's the ugliest flower that gives the greatest yield.

♥ If you're the leader, and another younger, stronger leader comes along, it's time to go. But take friends with you.

♥ Any box with a roof can be a perfectly good home. All you need is company.

♥ When the heat gets to you, fan.

♥ Remember, the only real purpose of your life is to see that things continue: Take care of the children.

♥ Hard work is a good way to get through life.

♥ There is nothing like being part of a big family.

♥ When it's cold out, huddle.

♥ When someone says you're ugly or stupid or fat, remember, viewed from above, we all look pretty much the same.

♥ In a feminist society, it's a good thing to be female.

♥ In running a country or a beehive, decision by democracy is never as good as decision by instinct.

♥ Learn to be versatile, for in your long life, you will do many jobs.

♥ Don't use your secret powers unless it's a matter of life and death.

♥ A real hero is someone who gives up his/her life for his country.

♥ When it rains, stay inside.

♥ Take care of your leader and your leader will take care of you.

♥ Who needs a king when a queen does so well by herself.

♥ On hot summer nights hang out with friends.

♥ If a revolution comes, be among the group that stays, rather than the group that leaves.

♥ Of all the jobs there are, it's great to work around the flowers.

♥ What you learn in life is everyone has a role to play, and every role is important.

♥ When you soar you will see the big picture. Soar often.

♥ One's personal opinion doesn't really matter much, in the face of disease, famine, pestilence, and starvation.

♥ The first rule of housekeeping is, don't let the dead lie around.

♥ As your group prospers, so will you.

♥ There is no more beautiful music in the whole world than the buzz of a hard-working organization.

♥ Above all, make Mother happy.

♥ If you're lost check out the sun and eventually, you'll find home.

♥ The most beautiful color in the world is translucent gold, the color of honey.

♥ Nothing works like cooperation.

♥ Give away half of whatever you create. Be charitable.

♥ Never harm a beekeeper. They have your best interests at heart.

Any help?