

MAR 2001



Bee Culture

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Harvest - 34**

Bee Space & Beekeeping Equipment
Removable Center Section

Tucson Lab To Close? - 14
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Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

MARCH 2001 VOLUME 129 NUMBER 3

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Pollen collectors explored in the second part of this series.

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MAILBOX

Disease Management

What a fantastic article on Honey bee diseases, "Disease Management," *Bee Culture*, January 2001. Though this information is readily available through various publications, this "condensed" version would be just right for beekeeper education in our local associations. Many beekeepers don't subscribe to *Bee Culture* and most of the beekeepers I have encountered won't take the time to read the rather large books "Diseases and Pests of Honey Bees" or "The Hive and the Honey Bee," but they will take readily to this information if provided in a simpler, quicker format at local association meetings. Are there any plans to produce this series into a booklet or perhaps into a downloadable format that we can access via PC?

Tim Bueler
Snohomish, WA

Jim Tew Fan

I am a hobby beekeeper. My body is 70+ years old, but my mind hasn't made up its mind yet on what it wants to be when I grow up. I got hooked on bees six or eight years ago, when one of my kids gave me a hive in kit form from Dadant because they knew I liked comb honey - which is of course the easiest thing to start with according to the people trying to sell hive parts and starter equipment. I was a commercial fisherman from about 1944 to 1994 when I retired - more from being forced out by restrictions and regulations, than age. Let me get away from that subject. I have never written to anyone I didn't know before, but I so much enjoyed reading your article *Bee Culture's* Beeyard "When is good science bad advice", I thought it would be a sin not to tell you.

Richard Taylor and Steve Taber have been my two favorite authors.

They write in understandable everyday English. Somewhere along the line, you got to the top of my list. Thank you.

Sonny Pilz

Newsletter Winners

Thanks so much for validating our journalistic efforts by awarding us - the Mt. Diablo Beekeepers Association's "Diablo Bee" - first prize in your 2000 newsletter contest. (Along with Tennessee's "The Hive Tool," a fine publication, indeed.)

Thanks you for conducting the annual contest to motivate us to work a little harder. It's sometimes a hard, hard job, and I know that for me each issue is like giving birth - lots of grunting and swearing at my husband. And your articles on improving newsletter excellence are just great. I'm immensely proud to have editor-ed - and usually everything else-ed - four national award-winning newsletters. And I have improved my game because of your articles. In a world where grammar, writing and spelling abilities seem to be a lost art, help in this direction is sorely needed.

Loni Reynolds
California

Gleanings - 72 Years

I have just renewed my subscription to *Bee Culture* for 72nd time, and it may well be the last time. A lot of water has gone under the bridge since my dad brought my first hive of bees home in a wheelbarrow. I subscribed to *Gleanings in Bee Culture* that same year - 1927. I have never been without bees or the magazine since then, except for the war years when I was busy elsewhere.

I bought my first copy of *ABC & XYZ of Bee Culture* in 1929 for the enormous sum of \$5.00 I believe. It's somewhat worn and decrepit now. I also have a copy of

the 32nd edition. Over the years I have kept bees both commercially and just for fun. I've always found them of great interest. About the time I think I know all about bees I learn something new. They never cease to amaze me.

Walter J. Kappel
Friendship, WI

No Crystallized Honey

When I started out in beekeeping I only had the basement to extract in, consequently, I had crystallized honey. Then when I got serious about beekeeping I built a shop and honey room in one end of my Morton building. Each room is 20' x 20', well insulated, with an Intertherm heater on 220 volts, which cost very little to heat.

In this part of Illinois we have humidity in the high 80% range. Then during the honey flow I watch the 10 o'clock news and when the humidity drops to the 40% range, I give the bees about five days to use the warm dry air and cap the honey. Meanwhile, the dehumidifier is running in the honey room. By the time I bring in the honey the humidity is low and the temperature is about 98°. As I extract, I run the honey over my homemade honey warmer, into two 25-gallon tanks. The immersion heater keeps the honey warm enough to run through two fine mesh strainer cloths. The next day while the honey cools I wash jars, heat them in the oven, and install new lids and labels. Then I bottle the two tanks and then start the whole process over again.

When the extracting is finished, the temperature drops back to normal. The bottled honey stays in the honey room until the following February or March when the last is sold. I am writing this in January, and the temperature has been about 0° to 10° the honey room is 40° and all is well.

I always make sure the honey

MAILBOX

is capped, the honey room has low humidity and the jars are dry. As a result, I haven't had crystallized honey in years.

Charles Leitner
Troy, IL

Bees Of Today

It seems to me that the current bees have more problems today than they did in the 20s.

When are we going to give the Afreican Bees a try and tame them and overcome some of their aggressiveness. They are small and five to seven times more productive with no enemies except for man. Being from Brazil when Brazil used to be 27th in honey production is today one of the top honey producers in the world - 3rd I believe.

Gene
Brazil

Bees & Art

I run bees along the Canadian Border in Montana along the eastern edge of Glacier National Park on the Blackfeet Indian Reservation. The Blackfeet Nation, this past Summer, erected sculptures created by a local native artist at the main entrance points to the reservation. Along with being impressive to look at, they are unique in that they are almost entirely made of used automobile

parts/scrap metal. The tails of the horses, for example are old barbed wire, the horses eyes are hubcaps, and the bodies of the horses and Indian riders are fenders and doors cut to shape and size with a torch.

They just happened to locate the photographed sculpture near one of my beeyards. Many times, as I work my bees, two or three cars will stop to snap pictures. So I think, before long, I may have one of the most photographed beeyards in the country.

Bob Fullerton
Babb, MT

What's The Secret?

In the January issue I noticed that the Wise Guy frowns a bit on the matter of the Honey packers and Dealers holding secret meetings where honey producers were not welcome. A bit interesting. Tell me please how an anonymous writer can with an innocent look complain about secrecy?

Glenn Gibson
Minco, OK

New Honey Bee Container

A new translucent squeeze container is available from The Honey Bee Container, Inc. Shaped like a cuddly honey bee the one-pound container has a flat panel for labels on both front and back. This container adds variety to your line of bears and tubes, and is something different for kids to enjoy. As low as \$.56 including cap and seal (in quantity), this container adds a new dimension to honey packaging. Available from The Honey Bee Container, 149 Patterson Rd., Roebuck, SC 29376, 864.476.6229, the honeybeecontainer@msn.com



New From B&B

VITA-BEE is a new pollen substitute from B&B Honey, Inc. It is a complete substitute containing all the high quality proteins, sugars, minerals, B-complex vitamins and the most palatable brewers yeast available. Tests conducted by Dr. Ray nabors of the University of Missouri concluded that package bees fed this mixture increased brood production by over 25%, drew 17% more comb and produced an additional super of honey because the early high populations were able to take advantage of minor honey flows. Overwintered colonies also increased populations to allow for stronger splits from established colonies. **VITA-BEE** is available in 50 pound, 25 pound and 5 pound lots and is available only from B&B Honey, Inc.





INNER COVER

My first real job in agriculture was working for Chuck Koval, a State Extension Specialist in Entomology at the University of Wisconsin. I worked part-time, mostly testing new pesticides on small fruits, orchard crops, garden crops, turf and greenhouse crops. If there was a bug on one of these plants that somebody didn't want, we were the people who got the call and were asked how to get rid of it. And, like now, pests became

resistant to old chemicals, and new products needed to be tested and registered. We were a small part of the testing procedure chemical companies used, looking at the efficacy (Did it kill the pests they wanted dead?), and plant toxicity (Did it not kill the plants it was being applied to?) aspects of the process. I killed pests on apples and flowers, on shade trees and ornamentals in the yard. In the vernacular, I was a nozzle head. We also grew and evaluated several hundred hybrid birch trees and hosted an All-America Garden, just to keep busy. In the Winter we worked on writing the extension bulletins the department published by the hundreds, and Chuck was a more severe critic of how things were to be written than any writing instructor I ever had. "Always remember your audience" was what I heard over and over and over. During all of this, however, my goal was growing the plants being used in the research whether zinnias, apple trees or pot mums in a greenhouse.

The area where we performed much of our outdoor research was on one of the university experimental farms, which the university shared with the USDA Honey Bee Lab. They had a full woodworking and machine shop, while we had a shed we kept our tractor in, no tools to speak of and no way to fix anything that broke. As a result of our meager budget, we borrowed extensively both the tools and the people who knew how to use them over the years so we could keep our operation moving along. They were generous with both.

As luck would have it, I got to know a lot about bees, beekeeping and honey bee research because I had to hang around while the shop's whiz repairman fixed what we had misused or overworked. And I got to know the people who worked at the lab, one of whom was Eric Erickson, the lab leader there. Dave Severson, now on the faculty of Notre Dame, and Rob Page, Chairman of the Entomology Department at Davis, California were there during this time also.

When I graduated, my extension appointment ended, and I was in need of a job. Coincidentally, at about the same time, Eric received a four-year grant studying soybean pollination and needed a person who could actually grow the soybeans he needed to study. It was one of those right-place, right-time things, and I got a job that lasted four years. And that was over 20 years ago.

I worked on this project with Dave Robacher, a post-doc student who was a researcher's researcher. His work was (and still is, I understand) both thought-provoking and elegant, and I learned a lot about statistics and control groups and the chemistry of nectars, flower aromatics and their attraction to honey bees. And I was also able to grow not only soybeans, but corn, cotton, sunflowers, hundreds of varieties of regular beans, garden vegetables and exotic

honey plants. It was a heady four years.

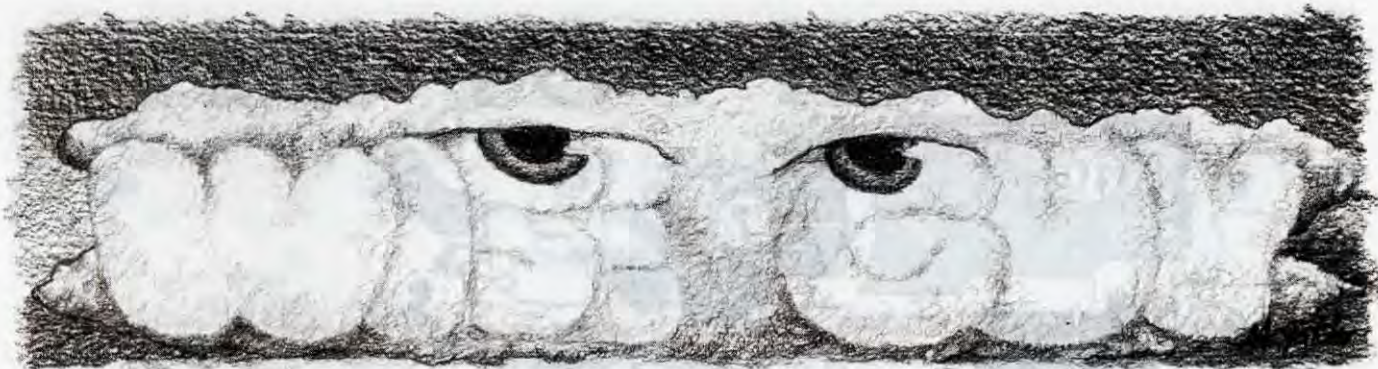
When the grant ended my job ended the joys of living on soft money . . . and a few years later I landed here. Since that time Eric and I have stayed in touch. From the magazine's point of view we've created some interesting and provocative projects. Eric's work with honey bees and firefighter's foam led directly to the production of the emergency training video for fire departments we made here. That video is now in thousands of fire departments in every state and over 50 countries—a testament not to the video, but to the simple and straightforward idea that led to it.

Eric has also published several articles in this magazine over the years, some of which have been controversial, especially from a conservative USDA's perspective. He has always pushed that envelope during his career, which is something we have had in common all these years. A while back he had his lab people make *McGregor's Handbook of Pollination* available again, this time on his Web page, which he generously shared with our page for a joint project in rewriting the entire book. This has gone more slowly than either of us would like, but in the meantime the major work in the field remains available to anyone with access to a computer. And, although our magazine is not a refereed journal, Eric and many of the scientists who work with him in Tucson have not let our readers slip below the radar when it comes to sharing information generated with public money. This is, I think, because Eric has a good sense of public concern, and because of the personal connection we developed over the years.

Elsewhere in this issue is an article containing information that may signal the last hurrah for the Tucson lab. For a lot of reasons I hope it isn't, but as I write this the news has just come out and the outcome is uncertain. Time will tell if the Tucson lab goes the way of the Wisconsin and Laramie Honey Bee Labs, and certainly other USDA research facili-

Continued on Page 39

Good People Slotting Fee Extortion Pollination Potentials



It seems that the Anti-Dumping action got a shot in the arm recently and it came from The American Beekeeping Federation. The Federation responded to the statements made by the Chinese/Honey Packers and Dealers attorney that by not being a petitioner they opposed the anti-dumping action. This message was also given to the ITC by the Honey Packers and Dealers representative that also gave testimony.

The attorney for the ABF sent a letter and objected to the testimony saying they opposed the anti-dumping. He explained to the ITC and the Commerce Department that the ABF only chose not to be a petitioner, but that they do support the idea. It's great to see most organizations come together on an issue as important as this.

Just how important is the anti-dumping? You be the judge. Figuring there are 1.8 million colonies in the U.S. (getting rid of the USDA

estimate that counts some colonies twice, thus estimating 2.1 million colonies), that produce 210,000,000 pounds of honey every year, every time honey increases 5¢ per lb. the producer side of the honey industry sees \$10,500,000 of additional income. If you break that down to each and every beekeeper in the United States that is a \$5.83 per colony increase for each and every hive. Can you imagine the effect of a 15¢ per pound income? If we could see that increase the 100 hive owner would see almost an \$1,800 increase. The 1,000 hive operator an \$18,000 increase and so on. These numbers could be off slightly as we have rounded.

If the Anti-Dumping can slow the imported honey or at least bring it to a level where it comes into this country at a price of 70¢ or higher then we will all reap the rewards.

The most ironic thing about the Anti-Dumping is that the packers may be funding our legal battles. A

law was enacted in 2000 by the apple industry says that a petitioner in an ITC Anti-Dumping case would receive the duties placed against that product. If the honey packers continue to import at the same level as in 2000 from China and Argentina, Sioux Honey and the American Honey Producers Association will divide approximately \$56,000,000 in duties. This money as I understand it will be used to fight Anti-Dumping now and into the future. The bad part of this is that the money won't be received by either organization until 2002. If this level of money is received I also understand that people that have contributed to the 2000 Anti-Dumping will be repaid. That is only a rumor and should be treated as that. But if you believe in American beekeepers making a living producing American honey, giving to the current Anti-Dumping case makes good sense.

Wise Guy

JERRY SHUMANS APIARIES

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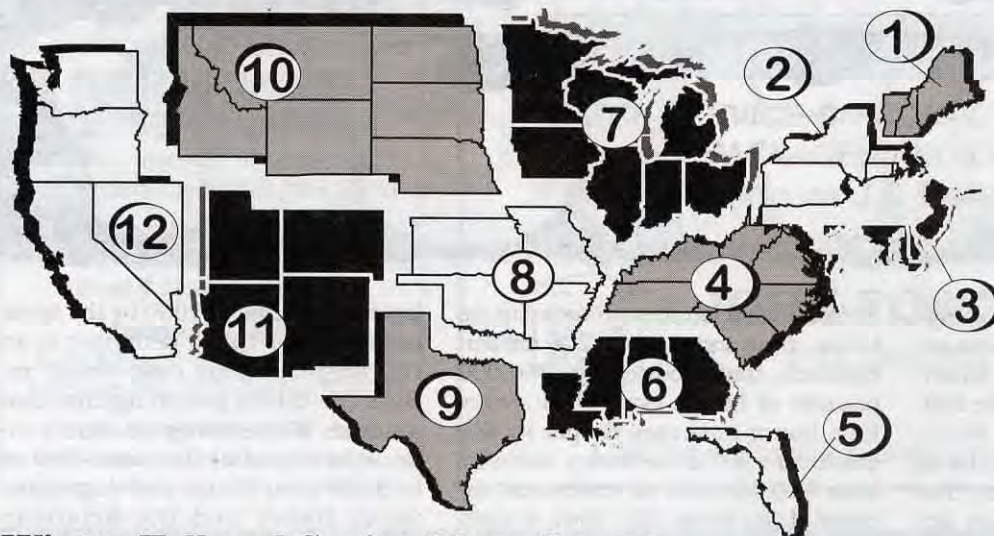
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MARCH - REGIONAL HONEY PRICE REPORT



Winter Toll and Spring Plans Survey

Colonies that have starved, or were near starvation were reported by 18% of our reporters in Feb. Highest in 1, 2, 3, 4, 8 and 10. Lowest in 5, 7 (still digging out in 7), 11 and 12. Generally northeast, north and northwest have had the greatest problem. Greater this year than many.

Overall, Nosema incidence was low with 11% of colonies showing problems, but Feb. is pretty early to tell if it will get worse. However, 1 and 8 were

over 75% already (symptoms, not actual diagnosis); 3 and 10 at 50%. Southern regions 5, 6, 9 and 11 report no problems at all, yet.

Asked about plans to deal with American Foulbrood resistant to terra many respondents (41%) favored burning contaminated equipment. However, 53% don't have a plan yet. One State Apiarist commented in January that more equipment has been burned in the last year than in the previous

10.

Queen problems still exist. Interestingly, the northeast, north and west have far more problems than the south and southwest (could there be a Nosema connection?).

What about this year's queens? For a variety of reasons 51% will raise their own this year rather than buy queens. The reasons given include high loss or supersedure after installation, drone layers, not resistant to diseases or mites, early death,

poor honey production, poor brood patterns, aggressive, and other reasons not clearly defined.

For those who will be buying queens we asked from where. Some answered...Hardemans, R&Bweavers, York, Miksa, Honeyland, Spell Bee, Rossman, Wootens, CanAm and Heitkams. Buyers tend to buy queens from their own region if possible. Many listed an area, N. California, Georgia, Florida, Louisiana and even Ohio.

	Reporting Regions												Summary		History	
	1	2	3	4	5	6	7	8	9	10	11	12	Range	Avg.	Last Month	Last Yr.
Extracted honey sold bulk to Packers or Processors																
Wholesale Bulk																
60# Light (retail)	68.97	60.67	74.00	70.80	75.00	64.67	61.38	69.42	77.50	83.00	80.00	60.75	45.00-140.00	69.54	69.68	67.41
60# Amber (retail)	65.27	60.67	68.00	69.62	64.50	63.00	62.71	62.50	70.00	80.31	75.00	56.75	45.00-130.00	65.94	67.29	63.78
55 gal. Light	0.58	0.60	0.60	0.60	0.60	0.57	0.60	0.67	0.60	0.57	0.65	0.65	0.50-0.70	0.61	0.63	0.62
55 gal. Amber	0.55	0.60	0.60	0.68	0.55	0.51	0.57	0.60	0.50	0.50	0.63	0.59	0.46-0.78	0.57	0.58	0.58
Wholesale - Case Lots																
1/2# 24's	28.56	26.13	31.42	32.86	31.42	28.00	28.12	31.42	30.00	31.42	24.00	31.97	20.40-44.40	29.46	30.39	28.68
1# 24's	42.88	42.14	48.00	44.90	38.00	44.50	41.00	44.48	44.70	43.80	50.00	46.44	26.10-65.00	43.73	42.90	42.22
2# 12's	40.53	39.60	45.65	41.14	40.00	36.30	37.63	41.36	39.10	39.00	46.00	43.37	29.40-84.00	40.77	39.71	39.22
12 oz. Plas. 24's	35.46	34.67	34.40	35.62	35.00	34.20	36.01	31.92	38.88	39.60	42.00	35.37	20.40-52.00	36.27	36.35	35.46
5# 6's	40.97	45.40	44.00	47.53	44.20	44.50	40.43	39.00	48.00	41.25	40.00	38.03	30.50-60.00	42.09	41.80	41.53
Retail Honey Prices																
1/2#	1.78	1.52	1.83	2.17	1.09	1.78	1.56	1.52	1.90	2.83	2.00	1.89	0.95-3.50	1.80	1.81	1.68
12 oz. Plastic	2.25	2.06	2.90	2.29	2.30	2.46	1.98	2.02	2.55	2.35	3.45	2.00	1.09-5.00	2.26	2.23	2.22
1 lb. Glass	2.78	2.44	3.00	3.03	2.66	3.29	2.45	2.54	3.30	2.25	3.90	2.84	1.58-5.00	2.81	2.75	2.64
2 lb. Glass	4.46	3.68	4.80	5.25	4.12	5.13	4.18	4.59	4.81	4.50	4.78	4.38	2.79-7.00	4.55	4.33	4.55
3 lb. Glass	6.34	8.25	7.80	6.83	6.50	7.57	5.70	5.98	6.75	6.96	4.99	5.65	3.89-10.50	6.48	6.41	6.37
4 lb. Glass	7.75	6.73	8.71	8.35	8.71	8.00	8.45	7.96	7.00	8.50	8.71	9.95	4.59-13.50	8.04	7.56	7.69
5 lb. Glass	9.52	8.35	11.00	10.14	10.00	8.90	9.63	10.97	9.00	9.95	11.95	8.38	7.00-16.00	9.67	9.35	9.56
1# Cream	3.09	2.96	3.93	3.34	3.93	3.26	2.80	2.86	3.93	3.93	5.25	2.84	2.18-6.50	3.11	3.48	3.12
1# Comb	4.23	3.76	3.60	4.31	4.60	4.17	4.38	3.50	3.76	4.60	7.50	5.31	1.95-7.50	4.35	4.06	4.06
Round Plastic	3.69	3.37	3.60	3.88	3.94	3.67	4.05	3.50	3.94	3.40	4.88	3.86	2.99-5.00	3.82	3.46	3.48
Wax (Light)	2.58	2.41	2.25	2.11	1.15	2.00	1.84	2.50	2.77	2.23	2.10	2.08	1.10-6.00	1.59	1.46	2.43
Wax (Dark)	2.22	2.25	2.03	1.80	1.00	1.50	1.77	2.05	2.00	2.75	1.75	1.20	1.00-5.00	1.24	1.13	2.10
Poll. Fee/Col.	36.88	38.40	34.00	38.40	27.50	39.00	38.67	39.00	24.15	36.00	50.00	42.80	20.00-50.00	38.01	37.29	38.14

? DO YOU KNOW ?

Bee Behavior

Clarence Collison
Mississippi State University

The activities of honey bees are regulated by many different factors associated with the environment in which they live and their internal physiology. Bee behavior in its simplest sense would be defined as the automatic reactions of an individual to stimuli found within or in the immediate area of the bee's body. Principle structures associated with behavior are the sense organs and glands of the individual bee. Interactions between colony members are also an important component. Stimuli associated with vibrations, odors, touch, taste, and light are detected by the bee through thousands of specialized sensory cells. Nerve impulses from these cells are processed along relatively fixed pathways of the nervous system and the individual responds

in a highly predictable manner. Many behaviors can be described as a more or less rigid sequence of actions. These behavioral patterns are innate and the way the individual reacts is dependent upon the stimuli encountered. Individual bees may react differently to similar stimuli because sense organs may have different levels of sensitivity related to genetic composition, and glandular differences associated with age and hormone levels. Not all reactions, however, are entirely mechanical. Numerous experiments with honey bees have shown that they also have the ability to learn which greatly adds to complexity of bee behavior.

Please answer the following questions to find out how well you understand honey bee behavior.

The first nine questions are true and false. Place a T in front of the statement if entirely true and an F if any part of the statement is incorrect.

1. ___ The honey bee central nervous system is composed of a ventral nerve cord and the brain.
2. ___ Honey bees can be trained to go to a source of food.
3. ___ Drones locate queens during a mating flight primarily by sight.
4. ___ Honey bees can differentiate between odors of different floral sources.
5. ___ Secondary colony reactions to smoke includes an increase in the number of guard bees at the hive entrance and a decrease in number of foragers leaving for the field.
6. ___ Many of the hairs on the surface of a bee are touch sensors.
7. ___ When there is a complete cloud cover, honey bees are unable to correctly indicate the direction of a food source when they are dancing.
8. ___ Each pheromone produced by the various exocrine glands consists of several chemical components.
9. ___ Worker honey bees must have direct contact with a queen in order to inhibit ovary development in workers.

Multiple Choice Questions (1 point each)

10. ___ Juvenile hormones are produced by the _____.
A. Salivary glands
B. Corpora allata
C. Hypopharyngeal glands
D. Koschevnikov gland
E. Tergite glands

11. ___ Honey bees are able to distinguish between sugar concentrations as small as:
A. 2.5%
B. 5.0%
C. 7.5%
D. 10.0%
E. 12.5%
12. Name three situations that result in worker honey bees fanning their wings. (3 points)
13. Describe how worker behavior is altered soon after a queen is removed or lost from a colony. (2 points)
14. Explain how the profitability of food rewards are communicated through the honey bee dances. (1 point)
15. Name three senses associated with the antennae. (3 points)
16. Which caste of honey bee has the largest number of sensory receptors on its antennae? (1 point)
17. What are the two ways in which "queen substance" is distributed within the hive? (2 points)
18. Name two stimuli used by guard bees to recognize intruders and robbers. (2 points)

Answers On Page 38

WESLACO 4

TUCSON 0

Everybody knew it was in the pipe, but they all thought it would last a bit longer. Floyd Horn, USDA ARS administrator ended any speculation in January when he announced at the American Honey Producers meeting that ARS (the USDA's Agricultural Research Service) was terminating funding and closing the Tucson Bee Lab on March 23, 2001. Spelling out the details, the four scientists and two permanent technicians were offered transfers to the Weslaco Bee Lab, early retirement or termination of USDA employment. The positions, filled by Tucson personnel or not, would be transferred to Weslaco along with Tucson's operating budget.

Since 1988 the budget at the Tucson lab has been frozen. As a result the lab has gone from nine to four scientists and from nine to two technicians. They have a budget of just short of \$1 million in hard funds per year, and nearly a half-million in soft money grants this year. They have six part-time people who will be gone, and an additional six Summer positions no longer available. Two term technicians and a visiting scientist will have to leave, and an independent researcher with a quarter-million dollar grant will have to find another home. Other soft money grants come from the Almond Board, California Beekeepers, a Bard grant and a joint project with Penn State. The fate of these is yet to be determined. The buildings, trailers, shops, greenhouses and lab space will be absorbed by the other USDA facilities onsite, and specific bee lab equipment, including the library, will be moved to Weslaco.

The bigger picture here is that a recent congressional study suggested that a better utilization of bee research funds would be to centralize all activities at the Weslaco lab, and this is just the first step in that plan. This means that Baton Rouge and Beltsville are also on a very short list.

Interestingly, industry reaction has been mixed. The American Honey Producers gave lip service support to the USDA decision, but the group neither strongly supported the move, nor strongly objected to the closing. The American Beekeeping Federation gave much stronger support to the lab and will explore every avenue available to halt or delay closing. The Almond Board has expressed significant concern at the loss of the only pollination lab as has the influential California Beekeeper's Association. The American Farm Bureau, always a friend of beekeeping, has moved this action to their highest priority. In their wisdom, the new Bush administration transition team conferred with the Farm Bureau before Jan 20, and this subject was on the list of bureau concerns.

The Tucson lab has not been without its problems, however. The funding and thus staffing problems mentioned above top the list, but other topics have surfaced over the years. Primary among them has been the direction of the research conducted at the lab. Industry groups have voiced concerns that the work has not been as practical as they would like, and that industry/lab communication has been less than satisfactory. Solving today's problems today is one side of this coin, but ARS more or less stresses both applied and empirical research from its scientists, so the Tucson people have tried to please two masters, probably not fully successful with either.

Even with all this, the lab has continued to produce, but much of it has been less visible and less applied than some in the industry would like. One argument often heard, not only by this lab but by honey bee researchers everywhere, is that they are at the service of beekeepers. The reality is that all taxpayers should benefit from publicly funded research. The Tucson lab has

provided an extraordinary amount of information for the public on dealing with African honey bees before and as they moved through Arizona. Educational kits for teachers in schools, videos for homeowners on dealing with AHB situations, SOP instructions for fire departments are just some of the work generated by the lab. If they hadn't done this work, who would have? is the unanswered question.

But practical beekeeping research, too, has come from these researchers. Pollination information for new and existing crops continues to come out for such diverse crops as almonds and sunflowers and some expanding oil crops. Work with wax moth biology and drone congregation areas has gone mostly unnoticed, but is not unimportant. *Varroa* detection and control projects have led to intensive biology studies of these mites, and alternative control strategies using essential oils and selecting bee strains resistant to mites have been studied – some of these studies are finished, others are ongoing. The Web page they offer is exceptional and reaches thousands of curious people – both beekeepers and others.

As of late January, none of the scientists or technicians were planning on moving to Weslaco. Retirement or family demands will keep them in Arizona. If the lab does close, then those six positions will be made available to Texas. However, a hiring freeze put in place by the new administration has muddled even that move, so the future becomes even less certain.

And why Texas? Like blended honey, apparently the USDA (and the congressional study committee) feels that tropical honey bee research applies to all parts of the United States. The politics behind the decision remain clouded, other than the rumors that always accompany such a move. And maybe the new politics in Washington will see

things differently (once the freeze is lifted). And maybe not.

And what of Weslaco? The bee lab there will have to really squeeze to fit in four new scientists. And, if nobody from Tucson moves, they will eventually have to recruit four scientists to fill those transferred positions. Recruiting people for that lab has been a definite challenge, with a couple of positions still remaining open even after aggressive tactics to fill them.

Will the Tucson lab close? Should the lab close? What will happen to the soft money? How will the beneficiaries of the work done there

accomplish their tasks now the almond people, the Bard grant people and the Penn State relationship? Can Weslaco fill the existing positions, let alone new ones added? Can industry and outside group support stop this action?

If you are concerned by all this the America Farm Bureau (www.FB.com) and the American Beekeeping Federation (www.AFB.org) are leading the resistance. Contact them to see how you can help.

No matter the outcome, next month we'll take an in-depth look at Weslaco the place USDA feels all bee research should be. **BC**

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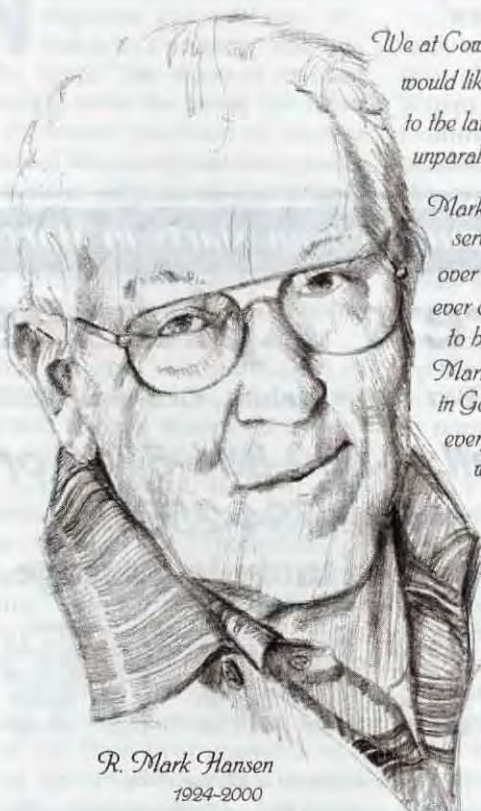
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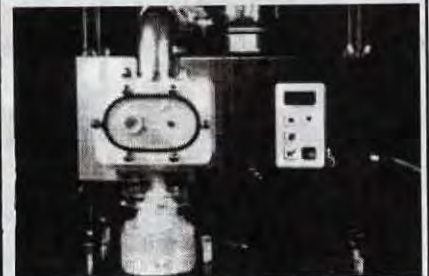
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Mark Winston

Winnie-The-Pooh



“Our Canadian provincial governments frown upon people shooting bears without a license.”

Not surprisingly, the Canadian newspapers headlined this feel-good story with the expected puns: “Honey, It’s Great To Be Home,” and “It’s All The Buzz.” For those of you not up-to-date with the latest hot news from the frozen heartland of Canada, the city of Winnipeg just bought the only known original oil painting of Winnie the Pooh, painted in the 1930s by the book’s original illustrator Ernest Howard Shepard for a Bristol, England, tea shop called Pooh Corner.

The painting was purchased at a Sotheby’s auction in England for \$190,000, mostly donated by civic-minded Winnipeg residents. It soon will hang in City Hall or the Manitoba Legislature pending the construction of the “Poohseum,” a museum memorial planned for everything Pooh. For now, though, beekeepers visiting government offices to pay their taxes or complain to their legislators can look forward to walking in and encountering a picture of the Pooh-bear standing in a field of flowers devouring a bucket of honey, surrounded by a few buzzing but helpless bees.

While your typical beekeeper may have convulsions or slip into an apoplectic fit upon viewing a painting that glorifies a bear eating honey, the non-beekeeping civilian population has a different point of view. Winnie the Pooh has delighted children for generations, and most urbanites still think of bears as cute,

fuzzy and cuddly creatures instead of the unpredictable wild animals they are.

Winnie the Pooh was not originally a painting, but a real black bear brought to London, England, by Winnipeg veterinarian Harry Colbourne. The bear was an orphaned cub that he encountered at the train station in White River, Ontario, on his way to serve in the First World War. Apparently he already felt homesick only a few hours into his trip to serve queen and country, because he not only picked up the bear and brought it with him to London, but he named it “Winnie” to remind him of his hometown.

The Canadian Armed Forces didn’t have much sympathy for homesick soldiers, and Colbourne had to drop Winnie at the London Zoo when ordered to proceed on to France. Winnie entertained and amused many thousands of children visiting the zoo, including a small boy named Christopher Robin Milne, who went home and christened his teddy bear Winnie the Pooh.

Christopher’s father, A.A. Milne, was inspired by his son’s stuffed teddy and wrote a book published in 1924 called *When We Were Very Young* that highlighted the antics of an overweight and undersmart bear, followed two years later by *Winnie the Pooh*. The series became hugely successful and timeless, delighting generations of children with Winnie’s antics.

The antics of black bears aren’t

quite as delightful to beekeepers, especially here in Canada, where black bears are common and beehives frequently ripped to sawdust by hungry bears. A typical conversation at a beekeeping meeting will involve bragging about how many bears were shot that year, and my own informal survey puts the average number of dead bears in and around apiaries at roughly 20-30 per commercial beekeeper per year. Even given the known tendency of beekeepers to exaggerate everything from how much honey we produced to how little money we’ve earned, that’s a lot of dead bears.

Our Canadian provincial governments frown upon people shooting bears without a license, but over the years have had a wide range of attitudes and programs involving bears and beekeeping. Some places some years have compensated beekeepers for bear damage; others haven’t bothered. Some provinces allow you to shoot bears if you notify the wildlife officer ahead of time, while others encourage conservation officers to bring in bear traps to apiaries to catch and remove nuisance bears.

Few jurisdictions are aggressive about prosecuting beekeepers who happen upon a black bear and remove it from its earthly existence. Governments recognize that in the battle between bears seeking food and beekeepers seeking income, perhaps it’s best to overlook the inevitable outcome. After all, beekeepers vote and bears don’t.

Continued on Next Page
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“While your typical beekeeper may have convulsions or slip into an apoplectic fit upon viewing a painting that glorifies a bear eating honey, the non-beekeeping civilian population has a different point of view.”

The problem from a bear's point of view is food, of which they need quite a bit to survive and breed. A bear emerging from her den in the Spring continues to lose weight until July, even with a diverse diet of green leaves, clover and dandelion flowers, fish, moose calves and fresh aspen leaves. During July and August, a female bear needs to double her body weight to have any hope of bearing cubs the following Spring, and during those few months bears become frantic about finding food.

Berries are the most important Summer food for bears, especially blueberries that occur naturally in forest gaps left by fallen trees. Bears may not be blessed with high IQs, but they are smart about the things that are important to them. A bear will remember the locations of seasonally available berry patches from year to year, and will migrate up to 50 or 60 miles to revisit a productive site they recall from the past.

An apiary of 20 or 30 beehives is food nirvana for a bear, packed full of juicy brood that is an excellent source of protein. Bears don't mind the honey, which is a considerably more concentrated source of sugar than a blueberry patch, but it's more the brood the bears crave than the honey. Of course, a painting of a bear eating larvae wouldn't have quite the appeal of a bear dipping into a honey bucket, hence the common misconception that honey is the sole hive elixir for bears.

Any beekeeper who has found an apiary that has been visited by a bear can testify to the power of these large and hungry creatures. Post-visit, entire apiaries litter the landscape, with boxes ripped to shreds, comb strewn everywhere, frames snapped and frame wires chewed through. The economic damage can be considerable; the average loss from a bear visit has been pegged at about \$16,000.

The persistence of bears also is

remarkable. Once they learn how tasty and nutritious a beehive is, they will return to the same apiary year after year. Sometimes a previously successful bear will push its way through even the strongest electric fence, ignoring the pain to get at the tasty morsels it has learned are behind the electrified barrier.

Most bears on their first visit can be deterred from an apiary by an electric fence, at least if they haven't fed previously on those or other beehives. Fences don't always work, however, since batteries run down, growing grass can short out a fence and beekeepers can't always return fast enough to an apiary to conduct regular maintenance.

The creativity of beekeepers in devising other defense systems against bears is remarkable, but bears may be more stubborn than even we beekeepers because they seem to overcome anything besides fences that we have devised. I've seen bees kept inside stout buildings, put up on poles, wrapped in heavy chain-link fencing, surrounded by loud sirens and protected by guard dogs.

Usually I've seen these sites post-bear, with the buildings or poles knocked down, the chain-link fence ripped to little pieces of metal and the guard dog looking forlorn contemplating its failure to protect its owner's bees. Besides a good fence or a vigilant, gun-toting beekeeper, bears seem to have the upper hand.

While we may bemoan the damage and be economically justified in sending a hive-crazy, hungry bear to its just rewards, part of me is saddened by our antagonistic relationship with these magnificent creatures. There is something totemic about a bear, ambling slowly through the forest, traveling in its own time and to its own drummer. Bears care little for our human needs and interests, and listen only to their own ancient and internal drives to find

food in the Summers and shelter for the cold Winters.

Then again, all nature is like that, moving in its own universe parallel to ours, modified by our heavy human footprint on the earth but patiently out-waiting and outlasting our species' presence.

We are a thinking species, conscious of our acts and impact, and perhaps we are doomed by our own nature to marvel at creatures such as bears while simultaneously feeling forced to protect our livelihood from their damage.

Winnie the Pooh may be the star of a wonderful children's book series, but this teddy-ish bear has done a disservice to its feral cousins by presenting these truly wild creatures as tamed for our amusement.

I guess I don't mind that the children of Winnipeg came forward with their piggy-bank quarters, and the leading citizens jumped in with larger checks. Yet, if I had my choice, I'd hang another painting next to Winnie, one showing a bear in the deep woods, wreathed in fog, standing proudly on its hind legs and looking outward with a deep gaze coming from the imponderable essence of being a real bear. **EC**

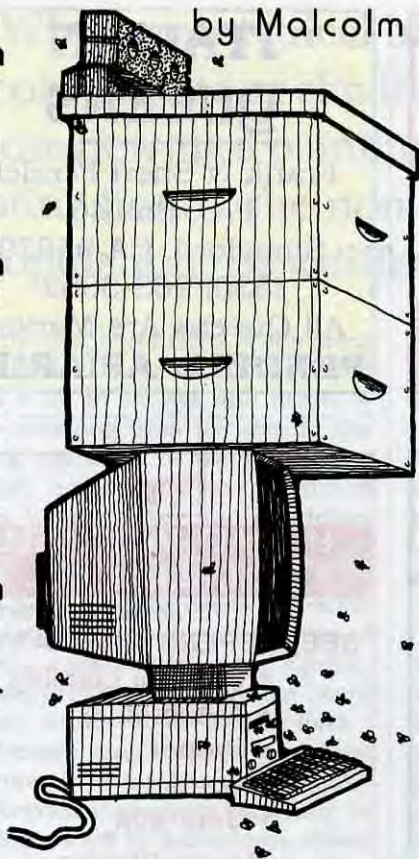
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by Malcolm T. Sanford



Last month I discussed the availability of information outside one's field and provided the example of Genetically Modified Organisms or GMOs and their relation to honey bees as an issue worth examining. That was based on doing one's own World Wide Web search. However, it is also possible to look at web sites where someone else has done the research and analysis. One example is what I call a **topical index** on my Apis web site. I have tried to organize articles written over the last two decades into certain categories for easier access. In addition, those reading this column will also remember certain points of view being **published** on World Wide Web sites that I have addressed.

Press releases about current events with regard to the pesticide imidacloprid have received attention on the beekeeping **discussion lists** and else where. This material has especially been implicated in bee kills in France. And in line with the furor of **mad cow disease** as a "hot button" issue with the press, the effects that this pesticide are thought to cause have been dubbed "mad bee disease" Allen Dick has developed a website dedicated to this issue entitled: "**Imidacloprid and Honey Bees: Can they co-exist?**" In his introduction, Mr. Dick says: "As other insecticides are phased out – due mainly to concerns about their safety – increasingly products containing Imidacloprid are approved in their place. Many, if not most agricultural consultants regard imidacloprid as promising and quite safe for the user, for the consumer, and for the environment. However, recently, partly as a result of beekeeper experience in France in particular, and Europe generally, partly because of new techniques to measure residues and detect effects, and partly due to questions about the quality of the research proving imidacloprid safe, con-

Issue Oriented Web Sites: The Imidacloprid Example

cerns have been surfacing about the potential dangers to the environment and to both natural and managed pollinators.

"Increasingly alarms are being raised that this chemical is systemic, persistent and damaging in subtle ways to bees at lower exposure levels than previously imagined. As a result, public protests in Europe have made the news and increased scrutiny is being directed towards the research that has been used to support the claims of safety. Demands are being made for proof that the science behind the new approvals is both independent and good science. The purpose of this site is to examine the issues fearlessly from all sides. Let the chips fall where they may."

An interesting wrinkle on this site is a sidebar, which enables translation of the page into a number of languages with just the click of a mouse. This is a service of **Systran Internet Translation Technologies**. Possible languages include Spanish, French, Italian, German as well as English.

According to the **Extension Toxicology Network** (Exttoxnet) at Oregon State University, "is a systemic, chloro-nicotinyl insecticide with soil, seed and foliar uses for the control of sucking insects including rice hoppers, aphids, thrips, whiteflies, termites, turf insects, soil insects and some beetles. It is most commonly used on rice, cereal, maize, potatoes, vegetables, sugar beets, fruit, cotton, hops and turf, and is especially systemic when used as a seed or soil treatment. The chemical works by interfering with the transmission of stimuli in the insect nervous system. Specifically, it causes a blockage in a type of neuronal pathway (nicotinergeric) that is more abundant in insects than in warm-blooded animals (making the chemical selectively more toxic to insects than warm-blooded animals). This blockage leads to the accumulation of acetylcholine, an important neurotransmitter, resulting in the insect's paralysis, and eventually death. It is effective on contact and via stomach action."

In the United States and elsewhere a major use of imidacloprid is in flea control on domestic animals. I can speak with experience that using imidacloprid in Florida has reduced flea populations on many furry pets to extremely low levels.

According to Mr. Dick, products containing imidacloprid employed in agriculture include Admire®, Condifor®, Premier®, Premise®, Provado®, and Marathon Impower 60 WP® and Merit 60 WP®. Although often mentioned in the same breath, he says Helix® does not contain imidacloprid. So far, most honey bee problems appear to have been associated with a product called Gaucho®. Bayer's new systemic insecticide **Gaucho 480 FL** has received regulatory approval in Canada, according to a web site that promotes the product. Used as a seed treatment on canola, rapeseed and mustard, it gives extended control of flea beetle. Gaucho® is the first of several new products expected to reach the seed-treatment market as the popular low-cost insecticide **lindane** is phased out of use over the next 18 months. Imidacloprid's active ingredient belongs

to a new class of insecticides that offer excellent systemic activity at low application rates, and with high levels of user and environmental safety. Gaucho 480 FL will be sold as part of Gustafson's "Gaucho Canola System," a seed treatment package including the fungicides carbendazim and thiram (active ingredients of lindane-containing Vitavax rs) plus metalaxyl (active ingredient of Apron FL). This combination controls seed rot, damping off, seedling blight and early-season root rots caused by pythium, alternaria and rhizoctonia species. It also controls seed-borne blackleg.

The major problems with Gaucho® have been mostly associated with French beekeeping according to Mr. Dick's site, which points to a web page constructed by Mr. Gilles Ratia of **Apiservices**. Since 1994, beekeepers have seen catastrophic decline in colony numbers and honey production correlated with the beginning of the sunflower bloom according to Mr. Ratia. Gaucho® has been used as a seed treatment for much of that crop. And because it is a systemic, it was thought and suspected by beekeepers that this was the cause of the problems because the material could be translocated from the seed into the rest of the plant. According to the Apiservices web site that describes the **evolution of the problem**, Mr. Ratia indicates that the 'Commission des Toxiques' asked its experts Mr's Belzunces and Tasei to make an appraisal using the known and available facts. Following the presentation of the report (December 11, 1997), an extensive program of studies costing 6,000 French Francs was conducted in 1998. The resulting report concluded there was "an apparent contradiction": the laboratory trials after analytical results on residues indicated a danger for bees from Imidacloprid at concentrations levels of a few parts per billion (ppb)." With this evidence, the Minister of Agriculture, Mr. Glavany, on January 22, 1999 stated that the use of Gaucho® on sunflowers was to be suspended in France until studies could be carried out in the years 1999 and 2000. This was the first time that the "Principal of Precaution" had been applied to an environmental problem in France according to Mr. Ratia. However, the manufacturer (**Bayer**) was able to have the order stopped, leading to protests in Paris, the latest on **December 18, 2000**. Mr. Dick also provides a link to breaking news, which contains a statement by beekeepers at the demonstration that concludes that during flowering, Gaucho®-treated sunflower and corn effectively expose adult honey bees to levels of pesticide, which laboratories show have produced negative effects.

The Gaucho® problem continues in France and begs an obvious question, when will it show up in Canada or the U.S.? Mr. Dick doesn't address that question directly, but provides a link to his thoughts on the issue in France, last updated December 21, 2000: "As I build this site, I am trying to reconcile some mutually incompatible ideas. This site is a reflection of my attempts to get a grip on this slippery subject. What is causing me grief is this: Scientists, whom I normally respect, have apparently investigated imidacloprid to some extent and concluded that it does not have damaging effects on honey bees - if applied according to recommendations. Beekeepers in Europe, whom I respect, are convinced imidacloprid is the cause of their recent catastrophic losses.

"There are several possible explanations. An obvious one is that some are lying, misrepresenting the facts or kidding themselves, but I find this hard to believe - and this way of thinking is not too useful for conflict resolution. Another, more reasonable explanation is that the two groups are not experiencing the same phenomenon, placing the same importance on the observations, or have different philosophies about the various points of disagreement.

"Perhaps agreement on basic observations and facts can bring the two sides closer to agreement, however, can they agree on risk assessment, risk allocation, and philosophy? Perhaps more research can decide some of the issues, but will beekeepers, naturalists and the public ever accept the use of a systemic chemical in food crops - a chemical which routinely occurs in concentrations very close to harmful doses for domestic bees and which may thus have unknowable environmental impacts on natural pollinators and wildlife?

"The beekeepers say that they have seen big losses and that these losses seem to be closely related to locations where imidacloprid has been used. Moreover, they believe that a chemical should not be used unless it is well proven that it does not have adverse effects on their livestock. They also maintain that the margin of safety between the levels where effects on bees are observable and the concentrations observed in plants after normal application is by far too small.

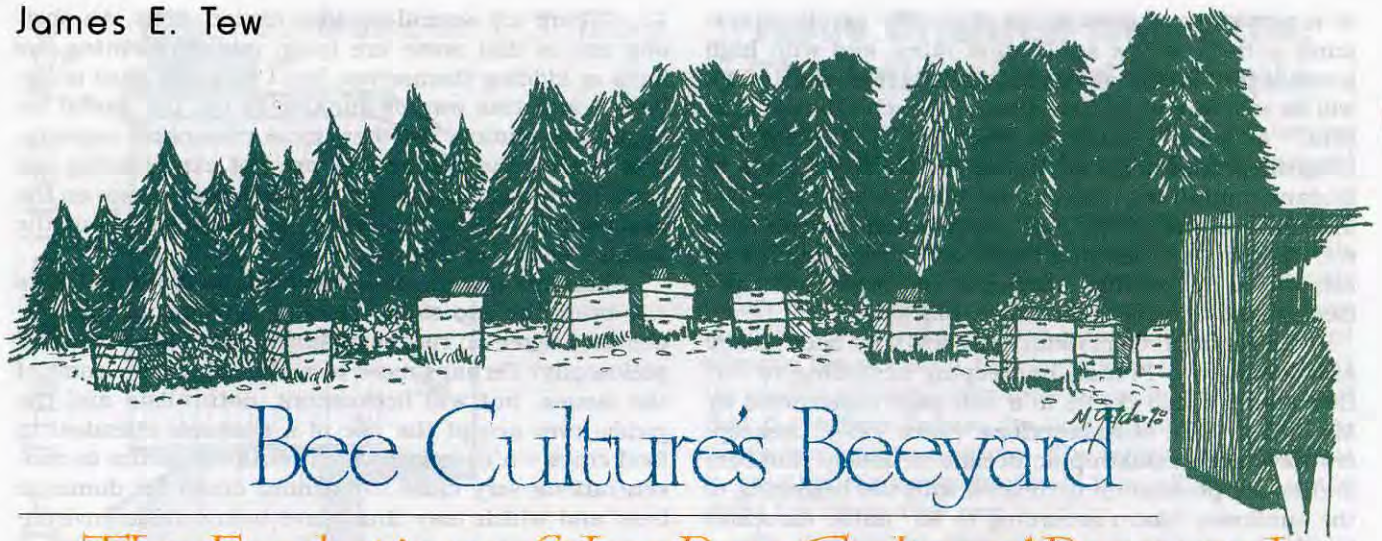
"The chemical companies and many farmers think that if no significant ill effects can be proven, they should be permitted to go ahead and spread the chemical throughout the environment, and that the benefits of using of this chemical far outweigh whatever adverse effects might occur.

"Scientists would normally be the natural arbiters of such a conflict since they are expected to be detached and fact-oriented. However, scientists working on such projects are usually nowadays - correct me if I am wrong - financed by the very companies wishing to get or maintain approval. The researchers face no personal risk from the application of pesticides, but face being passed over for funding if they do not provide the kind of results their employers wish. Public funding and beekeeper funding is available at only very low levels these days.

"It is possible, even likely, that most scientists' integrity will prevent dishonest science from occurring, however, recently, in Canada, one very nasty case became public when a university researcher released results unfavorable to her employer and was subjected to considerable torment - including dismissal. I'm sure that lesson has not been lost on many career researchers - or the public.

"Beekeepers are the ones facing the obvious risks - with no benefit. The chemical companies and sunflower farmers receive only benefits and see no risk to themselves. How can this difference of philosophy and self-interest be reconciled?" This leads to the *raison d'être* of this column; the World Wide Web provides the best technology where both parties can inform themselves of the position of the other and take action based on as full a knowledge of the issue as possible. **EC**

Dr. Sanford is Extension Specialist in Apiculture, Univ. of FL. He publishes the APIS Newsletter: www.ifas.ufl.edu/~mts/apishtm/apis.htm



Bee Culture's Beeyard

The Evolution of the *Bee Culture's* Beeyard

The Peaks and Valleys of Bee Life

The *Bee Culture Yard* is approaching three years old. Is that possible? The older I grow, the more compressed time becomes. Weeks seem to equal days, months seem to be about a week long and it feels that I have Christmas several times a year. Time flies. I don't even bother to put up storm windows any more. It's only going to be winter for a few months. Why bother?

In the early stages of starting the yard, there was equipment to be built, hive stands needed building, yard layout designed...all the tasks that I dutifully discussed in this magazine. Now those jobs are finished and another stage has begun – the maintenance stage. Doing things over and over again. Reversing inner covers, scraping bottom boards, mowing ever-growing grass, putting Apistan™ strips in, taking Apistan™ out, ad infinitum. Bluntly, I miss the early excitement of this project's genesis. How do I deal with the peaks and valleys of enthusi-

asm? Other than to just deal with it, I don't have the answer. Am I bored with the project? No, but I do miss the intensity of the early stages.

Keeping the Fires of Enthusiasm Hot

I have said repeatedly, that one of the great things about beekeeping is its seasonal nature. Just as I begin to whine about monotony of various seasonal tasks, it's time to begin another set of them for a different season. Though the weather

is still cold outside now (late January, 2001), I sense that spring is not far away. Good! I'm tired of winter and just keeping myself busy, but there's still so much to be done to prepare for the spring season.

The peaks and valleys of enthusiasm will come and go. Both your and my bee interest will evolve and change over the years. Bee things will change. Through the years, I have wired several thousand frames and embedded wires in wax foundation for countless hours. Now, more and more (much more), I am using plastic frames. I never want to wire another frame. Things change.

Winter Feeding Options

1. Feed honey in frames
2. Use a top feeder and feed honey¹ or sugar syrup or corn syrup
3. Feed dry sugar on the inner cover
4. Use a commercial frame filler and fill frames with syrup
5. Feed candy boards
6. Other more desperate procedures.

In the Yard

For the past four or five winters, most of us have had it easy – mild winters. Though the winter of 2000/2001 has not been any kind of a record breaker, it has been much more traditional. It has been cold. Reports of colony die-offs are already coming in and it will only get worse.

Here in Ohio, a local grocery chain donated a ton of sugar to a local beekeeper to help with the survival of his colonies. It made the state news and flashed around the media system. "Is this a bad Winter for bees?" was the common question. In fact, in many parts of the United States, it is shaping up to be a bad winter for bees.



A good colony in need of Winter food stores.

¹ Be aware of American foulbrood spread when feeding raw honey back to colonies.

Winter Feeding

For the first time in several years, my colonies are not doing very well. In fact, I already have had a casualty, but it was a small swarm for which I didn't have much hope anyway. I am surprised at how high up in the second deep most colonies are already – and there is still eight more weeks of winter to go.

One particular colony is in a crisis. It will clearly not make it. If it has a chance for survival at all, it will need to be fed. I hate winter-feeding. In most cases, it doesn't work for those of us in cold climates. What are my winter feeding options?

I don't have any more honey filled frames to give the bees. I used all of that making splits last season. Bees don't always use a top feeder very well during cold weather. Even though the food is hardly a few inches away, that can be a long cold trip for a starving bee. Dry sugar on the inner cover is fairly simple, but this is not the end-all answer. Some bees waste the sugar and a water source is required. Commercial comb fillers are expensive and the sugar syrup granulates quickly, but it does seem to work. I decided to tinker with a combination of #5 and #6.

An Untested Technique for Feeding Granulated Corn Syrup to a Wintering Bee Colony

I don't consider myself to be lazy nor do I try to take the easy path every time, but if I am to build gadgets or come up with ideas for emergency feeding, it must be quick and easy. In reality, we have other colonies that will need feeding, too, so the chosen procedure will be used several times. I'm tinkering with the following problem-filled experimental technique.

I already have corn syrup which has granulated. Several seasons ago, I explored the possibility of having the corn syrup granulate into blocks. I called them "feed bricks." It didn't work well. The syrup didn't granulate hard enough and these bricks could not be used in warm/hot weather. The advantages were that no mechanical feeder was required and it was fast and simple. Now that I have a feeding emergency at hand, I am again looking at some easy way

A commercial comb filter².



to feed slimy, sticky, partially granulated corn syrup.

Dave and I filled a feeder rim with granulated corn syrup. The rim is about 2 1/2" deep having all other measurements the same as a standard hive body. It was covered with a 1/4" plywood board. After filling it with granulated corn syrup, I used a queen excluder to form the other side.

At the hive needing winter feed, I flipped the feeder rim over so the excluder side was facing down; plopped it on the colony and closed it up.

When we put the feeder rim on, it was in the mid 30's so the bees could fly and were annoying.

Expected Problems

I knew the liquid component of the syrup would dribble onto the cluster. So why did I do it this way? The colony was already dry and hungry. I wanted the feed to be immediately available to the colony. If it drips too badly, it will have to come off. If it stops and the bees are able to clean up the liquid component, it can stay on for several more weeks.

I don't know how quickly it will soften once the weather begins to warm.

I returned the next day to see what was happening. Yes, the syrup was dripping onto the bees, but they were readily taking the syrup. I didn't open the hive enough to see if they were storing any, but I will keep watching it for the next few days to determine if it becomes too messy for the colony to handle.

This Discussion is NOT a Recommendation (at this time)

Until I know more, I am clearly saying that feeding granulated corn syrup in this manner is NOT a recommendation. I will have to get back to you on this one. If you have ideas on how to make this experimental procedure work better, please contact me. All the parts of a good idea are here, but it's not ready for general use.

Feeding Sugar Candy the Traditional Way

It's frequently too much work, but I like feeding sugar candy in candy boards to wintering colonies

A feeder rim filled with granulated corn syrup about to be placed onto a Wintering colony.



² Manufactured by the W.T. Kelley Company, Clarkson, KY 42726-0240



Feeder rim and excluder in place.

when they need additional food. Actually, candy boards can be used at any time during the year.

Construct a rim as I described earlier and make up the candy. A common recipe is: 15 pounds of granulated sugar, 3 pounds of glucose or white syrup, 4 cups of water, and ½ teaspoon of cream of tartar. Dissolve the sugar in the water by stirring and boiling the mixture until the temperature of the syrup rises to 242°F. Let the syrup cool to 180°F, and then beat until thick. Pour the candy into molds lined with wax paper. Then place on top of the frames near the cluster. Remove the residual cake as the weather warms.³

Plastic Equipment Update

A couple of comments on the plastic equipment saga in the BC yard. Some of you may remember from previous BC articles the skunk

problem I continue to have. One plastic hive is having particular problems with the animal chewing the hive equipment. I suppose I will just raise the colony off the ground rather than trying to eliminate the skunk. No doubt more would just show up. The damage is not yet terrible, but I cannot imagine that it is going to get any better.


Some comments on the other style of plastic equipment I have in the yard are in order. As I was checking the wintering progress of the colonies in the yard, I briefly opened all hives. All clusters in standard hives were tightly clustered and other than not enough food stores in some hives, all seemed normal. However, the plastic colony, made of expanded polystyrene had a loose cluster and individual bees were scattered all about the top of the colony. It was clearly warmer within



Bees feeding on granulated corn syrup.

the plastic hive than in the others. Is this good or bad? Will they use more or less winter stores? I don't know and an observation of one is clearly not enough to make any meaningful observations. However, since the walls are nearly 2" thick, it would stand to reason that it would be warmer in this unit. Again, no recommendation here, but just a general observation.

Some of you have asked how the 4-frame nucleus colonies are wintering. Honestly, I have not checked them but you and I both have a good guess what this cold winter has done to a lot of them. I will give a report on these small colonies in upcoming articles. (But I'm not optimistic.)

I suppose I should go check my "sugar-slime" hive. Just another Winter manipulation of bee hives from *Bee Culture's* Yard. 

Dr. James E. Tew, State Specialist, Beekeeping, The OH State Univ., Wooster, OH 44691, 330.263.3684, Tew.1@osu.edu

Skunk damage to a plastic hive.



A loose cluster in a polystyrene hive.



³ From: *The Hive and the Honey Bee*, Dadant & Sons, Inc. 1992. Pg. 637

BEE SPACE & BEE EQUIPMENT

What Is Bee Space? What Fits With What? Why?

Dave Heilman & Jim Thompson

In 1851, probably the biggest event in beekeeping occurred when L.L. Langstroth patented his beehive, which promoted the use of what he called *bee space*. He was not the first however to see that there was something to how honey bees use space. In his diaries he gives some credit to Bevan, Munn and a few others for their observations about how bees use space. When looking at beehives made before 1851 it's obvious that some beekeepers had already figured out the bee space concept. The problem was that either they didn't have the whole picture, or didn't realize what they had before them. So their discoveries went unnoticed by most of the beekeeping world. These were the beekeepers that helped Langstroth see the whole picture of what bee space was.

Langstroth came to the revelation that the concept of bee space needed to be used around the whole frame and not just for the top and bottom bars. His biggest contribution, in our opinion, was not in the actual discovery itself, but his promotion of it. This concept started a whole revolution of new ideas in beekeeping because now a hive could be opened, the frames manipulated, and observations made of the mysteries inside without damaging the colony. Today, bee space is taken for granted because most of us really have never known what it is like to keep bees in only gums and skeps.

Bee space has been accepted throughout the years to be an open area measuring no less than a quarter-inch and no larger than three-eighths of an inch. In human terms think of bee space like human space, for example the size of a hallway, or

doorway in a house. If an open space between hive parts is less than 1/4" bees will usually fill it with propolis. However, if the space is larger than 3/8" bees will usually fill the area with beeswax comb. There are some exceptions to this rule, such as the size of the hive population, a lack of, or abundance of a nectar flow, and the hive's *individual* character. Most of these exceptions are only temporary however, because these factors change. Beekeepers normally notice these violations when trying to separate the hive bodies and pull frames from them.

All hives are not made the same and over the years beekeeping has

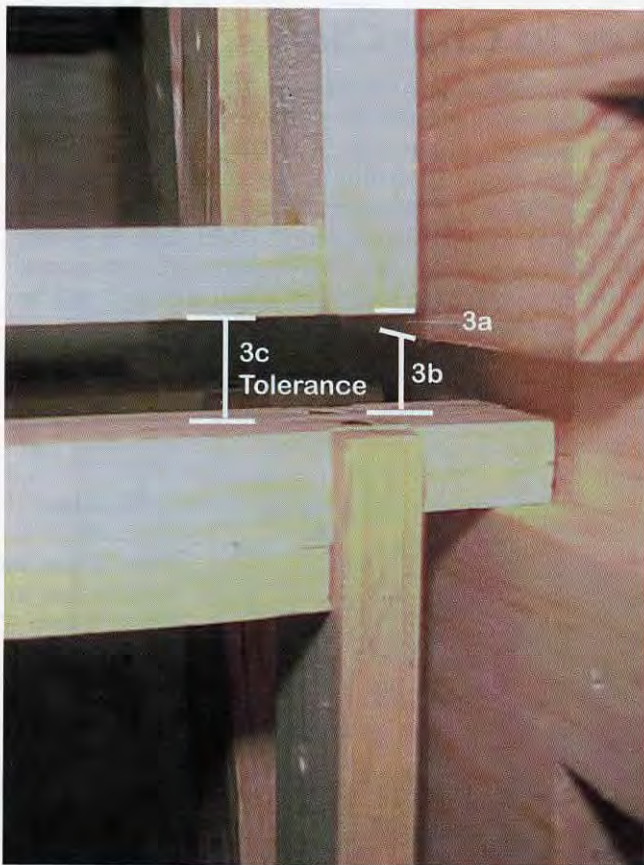
seen literally hundreds if not thousands of different designs. Just a few decades ago the eight frame hive was very popular. There were also hives that held more than 10 frames and others that varied in depth. In Canada Langstroth hives are made a little wider than they are here in the U.S.

Manufacturers of bee equipment have taken it upon themselves to use the concept of bee space in their own way. Langstroth mentioned that in his hive he leaves 1/8" space between the top of the frames and the top edge of the super or hive body they sit in. Also, he left a quarter-inch space between the bottom of the

Chart 1.

SUPERS				
Manufacturer	Height	Length	Width	Depth of Rabbit
Deep				
Brushy Mtn	9.438	19.875	16.187	0.671
Dadant	9.5	19.843	16.25	0.638
Kelley	9.5	19.812	16.25	0.672
Mann Lake	9.625	19.906	16.218	0.702
Rossmann	9.468	19.937	16.25	0.621
Medium				
Brushy Mtn	6.437	19.875	16.187	0.663
Dadant	6.515	19.843	16.25	0.628
Kelley	6.562	19.812	16.25	0.622
Mann Lake	6.562	19.906	16.218	0.712
Rossmann	6.625	19.937	16.25	0.607
Shallow				
Brushy Mtn	5.562	19.875	16.875	0.64
Dadant	5.5	19.843	16.25	0.648
Kelley	5.687	19.781	16.25	0.625
Rossmann	5.687	19.937	16.187	0.612

All measurements in inches.



The photo illustrates the charts 3a, 3b and 3c. 3a is the space below frames; 3b, the space above frames; and 3c reflects the bee space tolerance of the combined spaces 3a and 3b.

hives bodies were assembled with glue and screws. The fourth side was fastened with just screws so that it could be removed for measuring and photographic reasons. The exterior dimensions (length, width, height) of each hive body were taken, along with the depth of each rabbet (see chart 1). The frames were assembled tightly with glue and nails. The lengths of the frame top bars and end bars were measured (see chart 2). The assembled frames were then hung in the hive bodies with their top bar ears centered between the rabbets. The ears were then marked at the point they intersected and rested on the rabbet. At this mark, the thickness of the ear was measured (see chart 2). The frames were then set in the various hive bodies and measurements were taken to see how much space there was between the top edge of the top bar and the top edge of the box. Because beekeepers mix the equipment (ie. frames and hive bodies) of different manufacturers this space was also calculated for each possible combination (see chart 3c).

Also, look closely at chart 3a and 3b. Chart 3a shows the space remaining below the bottom of any particular frame and the bottom edge of any particular box it is

Chart 2.

FRAME MEASUREMENTS

Manufacturer	Style	Length of Top Bar	Length of End Bar	Ear Thickness
Deep				
Brushy Mountain	Wood	18.937	9.094	0.402
Dadant	Wood	18.968	9.125	0.435
Kelley	Wood	18.937	9.125	0.367
Mann Lake	Wood	18.937	9.125	0.419
Rossman	Wood	18.937	9.125	0.415
Apiary Plastic	Plastic	19	9.063	0.463
Dabur	Plastic	18.968	9.125	0.444
Econ Station	Plastic	18.968	9.125	0.441
Pierco	Plastic	18.937	9.125	0.442
SnapLoc (Dadant)	W & P	18.968	9.25	0.409
Standard (BetterB)	W & P	18.968	9.188	0.412
Medium				
Brushy Mountain	Wood	18.937	6.25	0.402
Dadant	Wood	18.968	6.25	0.435
Kelley	Wood	18.937	6.25	0.367
Mann Lake	Wood	18.937	6.25	0.419
Rossman	Wood	18.937	6.25	0.415
Perma comb	Plastic	19	6.062	0.392
Pierco	Plastic	18.937	6.25	0.45
Simon	Plastic	18.937	6.187	0.433
Shallow				
Brushy Mountain	Wood	18.937	5.375	0.402
Dadant	Wood	18.968	5.375	0.435
Kelley	Wood	18.937	5.375	0.367
Rossman	Wood	19	5.375	0.415

All measurements in inches.

frame and the bottom edge of the same box. In theory, this would leave a 3/8" space between the top bars of a lower frame and the bottom bars of the frame above. Some manufacturers now have a large space above the frames and almost none at the bottom, while other manufacturers leave almost no space at the top of the frames, leaving a large space below the frames. Still others split the bee space between the top and bottom. Most of these differences are due to the depth of the rabbet (the recessed cut area that forms the frame rest) and not the size of the frame. However, some will cut a deeper rabbet and then install a metal frame rest that raises the frame back up to (then) correct bee space. Installing these "L" shaped frame rests, or frame spacers, could negatively alter the bee space.

This article is being written to see what equipment combinations are compatible and still adhere to this sacred bee space *concept*. For this comparison, equipment was purchased from different manufacturers and in the case of equipment no longer manufactured but still available, unused samples were acquired from the Beekeeping Museum at The Ohio State University in Wooster, OH. This article does not cover equipment from every manufacturer there ever was, nor does it consider homemade equipment. Our goal is to try to help people figure out why some equipment always seems to be propped together, or has a lot of burr comb (comb built in an unwanted location), and why some does not.

The equipment was ordered from different manufacturers in December of 2000. It was ordered anonymously, to insure that the equipment was selected randomly. When the equipment came in, three sides of the

EXCLUDERS

Manufacturer	Style	Length	Width	Above Wires	Below Wires	Thickness Of Material
Brushy Mtn	Wood Bound	20.063	16.5	0.01	0.344	0.474
Dadant	Plastic	19.687	16.125	0	0	0.057
Kelley	Wood Bound	19.812	16.25	0.22	0.253	0.554
Kelley	Zinc	19.812	16.031	0	0	0.014
Mann Lake	All Wire	19.75	16.281	0.017	0.086	0.182
Root (Original)	6 Slats	19.875	16.125	0	0.177	0.69
Root (Original)	10 Slats	19.812	16.094	0	0.21	0.678

All measurements in inches.

INNER COVERS

Manufacturer	Style	Length	Width	Thickness of Rim on	Thickness of Rim on	Thickness of Center
				Top	Bottom	Board
Brushy Mtn	plywood	19.891	16.25	0.405	0.018	0.758
Dadant	masonite	19.812	16.25	0.425	0.211	0.761
Kelley	plastic	19.937	16.25	0.332	0	0.6
Kelley	wood	19.75	16.25	0.365	0.049	0.741
Mann Lake	plywood	19.937	16.25	0.272	0.272	0.752
New Age	foam	19.937	16.219	0.375	0	1.018
Rossman	wood	19.875	16.25	0.393	0	0.758

Plastic nubs = .236 (only on Kelley plastic)

All measurements in inches.

placed in. Basically, it is the empty space below the frames. Chart 3b shows the space above the top of the top bar and below the edge of the box it is hanging in.

When any box, containing any frame is placed on any box, containing any frame, the resulting bee space tolerance, that is the space below the frames on the top box combined with the space above the frames on the bottom box that remains empty is shown in chart 3c. The diagram 3d defines the *tolerances* each color represents in the chart 3c.

Using Langstroth's bee space of $\frac{1}{4}$ " to $\frac{3}{8}$ " as the Golden Rule of how all bees use space, Chart 3c shows what combinations adhere to or violate this concept. Keep in mind that many things could have effected our measurements. Factors to consider are the moisture of the wood at time of manufacture, calibration of cutting equipment, and yes-even error in using and reading our tools.

This article does not recommend one manufacturer's equipment over another because of these factors. One has to decide what tolerances are humanly and realistically obtainable. In theory a manufacturer could make a box today that was perfect in regards to bee space, but next month be off due to temperature and moisture. We are, however, trying to make beekeepers aware that there is a difference in how manufacturers make their equipment. Because of this, some equipment will work better with others. In an ideal beekeeping world all of the manufacturers would make their equipment to exactly the same specifications. This would reduce the room for error when looking at it from the point of bee space being the Golden Rule. A primary question to ask is - Is bee space really what we think it is? Is it smaller or bigger? Langstroth came up with his hive 150 years ago, are our bees today the same as they were then? Evaluate your equipment to see if there is enough of a problem to warrant modification.

Key to Chart 3c.

We have measured the bee space that exists when any frame is hung in any super, and placed on any box with any super. Colors indicate **NOT** the measurement, but rather the relationship of that space compared to bee space. Thus, combinations that are **green** are within the range of space considered ideal. Combinations shown **gold** are within range but almost too small, while combinations in **brown** are too small and generally will be filled with propolis.

Combinations in **yellow** are heading toward too large but are still within range, while combinations showing **red** are considered too large and will likely be filled with burr comb.

① Detail of Chart - Equipment Placed on Bottom

Manufacturer of Super →	Dadant	D-Brushy	← Size of Frame and Manufacturer in Super (D-deep; M=medium; S=shallow)
		D-Dadant	
		D-Kelley	
		D-Mann	
		D-Rossman	

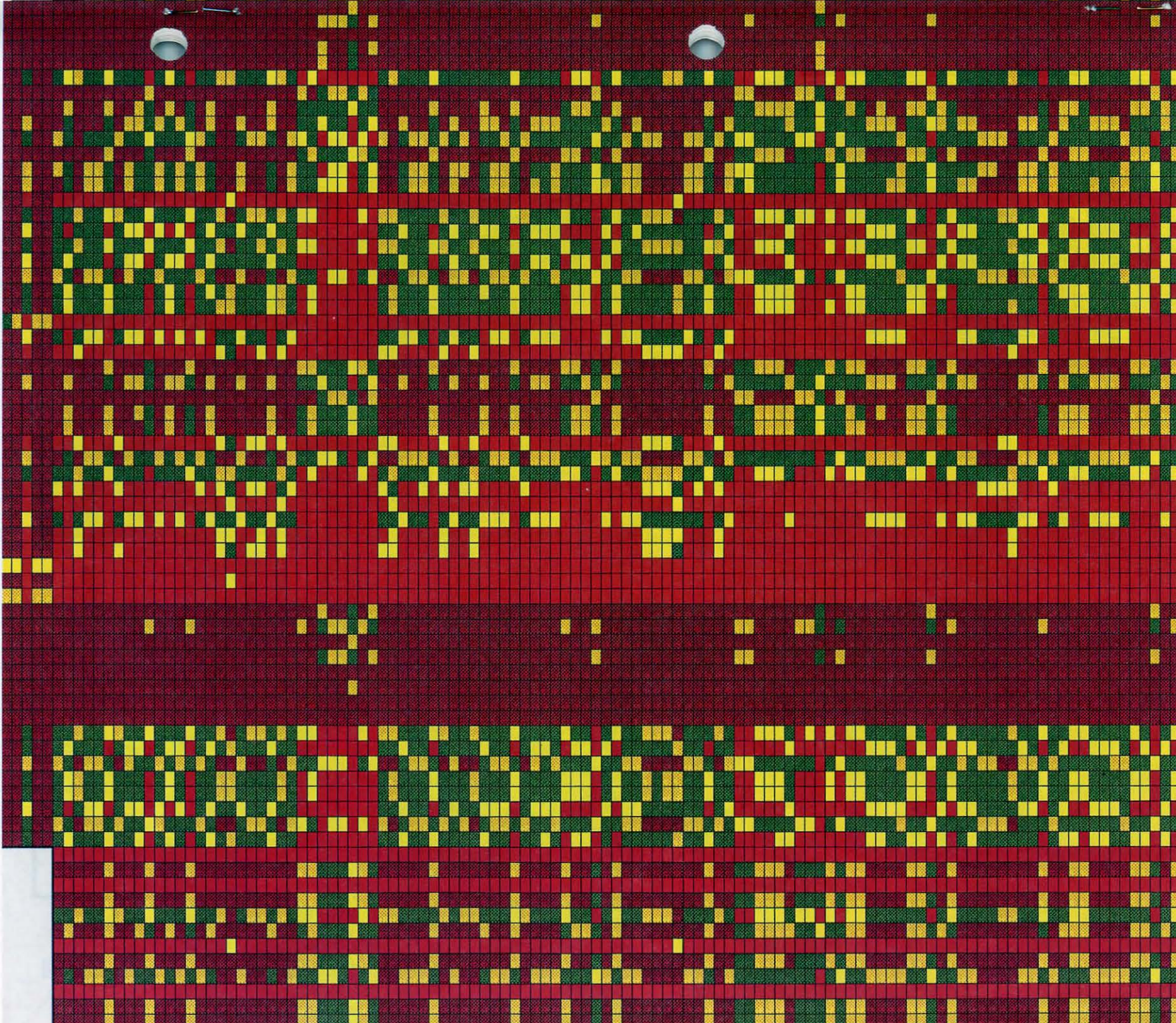
② Detail of Chart - Equipment Placed on Top

Manufacturer of Frames in Super ↓	D-Brushy	D-Dadant	D-Kelley	D-Mann	D-Rossman	← Size of Frame and Manufacturer in Super
	Kelley					
Manufacturer of Super →						

③ Excluder section on bottom left side of chart 3c indicates space above excluder and below frames in top box.

④ Excluder section on top, far right side of chart 3c indicates space between bottom of excluder and top of frame in super below.

⑤ Inner Cover. The only bee space measurements taken for inner cover space tolerances were between the bottom of the center boards of the inner cover and the top of the frames below.



U-Standard
Brushy
M-Brushy
M-Dadant
M-Rossman
M-Pierco
M-Perma C
M-Simon
Dadant
M-Brushy
M-Dadant
M-Kelley
M-Mann
M-Rossman
M-Pierco
M-Perma C
M-Simon
Kelley
M-Brushy
M-Dadant
M-Kelley
M-Mann
M-Rossman
M-Pierco
M-Perma C
M-Simon
Mann
M-Brushy
M-Dadant
M-Kelley
M-Mann
M-Rossman
M-Pierco
M-Perma C
M-Simon
Rossman
M-Brushy
M-Dadant
M-Kelley
M-Mann
M-Rossman
M-Pierco
M-Perma C
M-Simon
Brushy
S-Brushy
S-Dadant
S-Kelley
S-Rossman
Dadant
S-Brushy
S-Dadant
S-Kelley
S-Rossman
Kelley
S-Brushy
S-Dadant
S-Kelley
S-Rossman
Rossman
S-Brushy
S-Dadant
S-Kelley
S-Rossman
Excluder
Brushy
Dadant - Pla
Kelley Wood
Kelley Zinc
Mann
Inner Covers
Brushy
Dadant-
Kelley (P)
Kelley (W)
Mann
New Age
Rossman

EQUIPMENT TO BE PLACED ON TOP

4

5

Chart 3a.

BOTTOM SPACE

Deep Supers

	Brushy Mtn	Dadant	Kelley	Mann Lake	Rossman
Brushy Mountain	0.075	0.17	0.136	0.231	0.155
Dadant	0.077	0.172	0.138	0.233	0.157
Kelley	0.009	0.104	0.07	0.165	0.089
Mann Lake	0.061	0.156	0.122	0.217	0.141
Rossman	0.057	0.152	0.118	0.213	0.137
Apiary Plastic	0.167	0.262	0.228	0.323	0.247
Dabur	0.086	0.181	0.147	0.242	0.166
Econ Station	0.083	0.178	0.144	0.239	0.163
Pierco	0.084	0.179	0.145	0.24	0.164
SnapLoc (Dadant)	-0.074	0.021	-0.013	0.082	0.006
Standard (BetterB)	-0.009	0.086	0.052	0.147	0.071

Medium Supers

	Brushy Mtn	Dadant	Kelley	Mann Lake	Rossman
Brushy Mountain	-0.074	0.039	0.092	0.002	0.17
Dadant	-0.041	0.072	0.125	0.035	0.203
Kelley	-0.109	0.004	0.057	-0.033	0.135
Mann Lake	-0.057	0.056	0.109	0.019	0.187
Rossman	-0.061	0.052	0.105	0.015	0.183
Perma comb	0.104	0.217	0.27	0.18	0.348
Pierco	-0.026	0.087	0.14	0.05	0.218
Simon	0.02	0.133	0.186	0.096	0.264

Shallow Supers

	Brushy Mtn	Dadant	Kelley	Rossman
Brushy Mountain	-0.051	-0.121	0.089	0.102
Dadant	-0.018	-0.088	0.122	0.135
Kelley	-0.086	-0.156	0.054	0.067
Rossman	-0.038	-0.108	0.102	0.115

All measurements in inches.

Chart 3a.

Numbers on this chart reflect the space between the bottom of a frame (manufacturers on left side of chart) that hangs in a super (manufacturers along the top of the chart), and the bottom of the super itself, for deep, medium and shallow supers.

Key To Manufacturers Listed On Chart 3c Previous Page

- Brushy – Brushy Mountain Bee Farm, Inc.
- Dadant – Dadant & Sons
- Kelley – Walter T. Kelley Company
- Mann – Mann Lake Ltd.
- Rossman – Rossman Apiaries
- Apiary Plastics – Out of Business
- Dabur – Sold By Various Distributors (made in Asia)
- Econ Station – Economy Station (out of business)
- Pierco – Pierco Inc. (division of Cal-Mold)
- Snap Loc – Wood & Plastic Frame sold by Dadant
- Standard – Made in Greece (sold by various distributors)
- Perma-Comb – Made by Universal Plastics
- Simon – Plastic Frame sold by Betterbee

Chart 3b.

Numbers on this chart reflect the space above the top bars of any particular frame (manufacturers on left) and the top of the box they are hanging in (manufacturers across top).

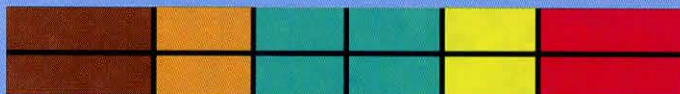
Chart 3b.

Bee Space Tolerance Color Key

The chart 3c depicts the tolerance of any combination of frames and supers to the Golden Rule bee space of 5/16".

Cells on the chart that are green are within the perfect space. Gold cells are heading toward spaces that are too small, and brown cells are spaces that are too small.

Combinations that are still O.K., but heading toward too big are yellow, and combinations that have too much room are marked red. Acceptable bee space **tolerance** is the combined space of gold, green and yellow on chart 3c (previous page).



1/4" 9/32" 5/16" 11/32" 3/8")
 or or or or or
 .250" .281" .320" .344" .375"

DECIMAL EQUIVALENTS

- 1/32 = .031
- 1/16 = .063
- 1/8 = .125
- 9/32 = .281
- 5/16 = .320
- 3/8 = .375

TOP SPACE

Deep Supers

	Brushy Mtn	Dadant	Kelley	Mann Lake	Rossman
Brushy Mountain	0.269	0.236	0.27	0.3	0.219
Dadant	0.236	0.203	0.237	0.267	0.186
Kelley	0.304	0.271	0.305	0.335	0.254
Mann Lake	0.252	0.219	0.253	0.283	0.202
Rossman	0.256	0.223	0.257	0.287	0.206
Apiary Plastic	0.208	0.175	0.209	0.239	0.158
Dabur	0.227	0.194	0.228	0.258	0.177
Econ Station	0.23	0.197	0.231	0.261	0.18
Pierco	0.229	0.196	0.23	0.26	0.179
SnapLoc (Dadant)	0.262	0.229	0.263	0.293	0.212
Standard (BetterB)	0.259	0.226	0.26	0.29	0.209

Medium Supers

	Brushy Mtn	Dadant	Kelley	Mann Lake	Rossman
Brushy Mountain	0.261	0.226	0.22	0.31	0.205
Dadant	0.228	0.193	0.187	0.277	0.172
Kelley	0.296	0.261	0.255	0.345	0.24
Mann Lake	0.244	0.209	0.203	0.293	0.188
Rossman	0.248	0.213	0.207	0.297	0.192
Perma comb	0.271	0.236	0.23	0.32	0.215
Pierco	0.213	0.178	0.172	0.262	0.157
Simon	0.23	0.195	0.189	0.279	0.174

Shallow Supers

	Brushy Mtn	Dadant	Kelley	Rossman
Brushy Mountain	0.238	0.246	0.223	0.21
Dadant	0.205	0.213	0.19	0.177
Kelley	0.273	0.281	0.258	0.245
Rossman	0.225	0.233	0.21	0.197

All measurements in inches.

Finding

HYGIENIC BEHAVIOR

Why is it important for you to have hygienic queens in all your hives?

Steve Taber

This article is concerned with the commercial aspects of bees who exhibit "hygienic behavior" (HYG), known in the past as "disease-resistant bees." As has already been mentioned, Dr. O.W. Park and some associates began breeding bees for resistance to American foulbrood way back in 1935. Sometime during the 40s after they had demonstrated beyond a doubt that they did have disease-resistant stock, they put them up for sale. They were advertised in the *American Bee Journal* by the Iowa Beekeepers Association.

Their first release was to bee extension agents, who were to limit receipt of these queens, one queen to one person. The object was that each person would raise daughter queens to requeen his apiary and sell to other beekeepers. I got one of these queens in my early years of keeping bees, and I will tell you their worker bees were fierce. I read and heard from various sources that the bees were too hot for any but weird beekeepers to have any use for.

Coincidentally, Professor L. Haseaman and his associates at a Missouri university discovered that a sulfa drug fed to infected bees would enable the bees to clean up the disease. A great debate arose among beekeeper organizations around the country centered on the use of this drug versus the burn-and-destroy method used by state bee inspectors for many years. I remember I was at the Baton Rouge bee laboratory at the time, and it split the beekeepers in the state just about in half. It was so bad that the Louisiana State Beekeepers were now divided into two groups, the second

group calling themselves the "Progressive Beekeepers Association." All that occurred about 1965.

The debate came to a conclusion about the time the federal government announced the withdrawal of the sulfa drug being used because residues of the drug were showing up in honey. Terramycin was then introduced and was used by beekeepers for many years. Most state governments abandoned the inspection and burn laws, opting instead for instruction to beekeepers on how they could treat their hives to prevent the occurrence of AFB.

Meanwhile, back at the ranch, about the mid-50s, Dr. Walter Rothenbuhler started working on his long career to determine the genetics of bees resistant to AFB. He discovered there were two genes or genetic factors that were responsible for bees being resistant to the disease, these factors being the uncapping of a diseased cell and the removal of the dead larvae. Further, he discovered that to test for disease resistance you did not have to test the units with samples of disease, but that you only had to test with brood which had been killed.

Looking back (hindsight, as you know, provides perfect vision), I think Walter made a mistake by not telling beekeepers how and where they could find disease-resistant stock in their own bees. However, I know Walter had more than enough to do at this time, and besides, he wanted to leave something for other people to work on. Walter wrote about his work in the scientific journals and bee magazines and spoke of it in many of his lectures. Unfor-

tunately it seems nobody paid much attention, and his work was almost forgotten.

The second time disease-resistant bees were offered in the commercial market was the result of my work. When I left the federal government bee research unit at Tucson, I realized that I would have to have a "gimmick" or something different about my bees if I was going to raise queen bees for a living. I had already found out how easy it was to acquire the HYG stock, so as soon as I could, I got my own bees in 1979 and began testing and selecting stock that had the characteristics of HYG or disease resistance. In the beginning, I thought that I would hold this information as a trade secret about how I got the stock and maintained it and so on. After due contemplation, I decided this was a mistake and published it in the *American Bee Journal* in June 1982. At that time I did not use the term "hygienic behavior" as I thought beekeepers would not associate HYG with bees being resistant to AFB.

Looking back, I am amazed at how few beekeepers were interested in disease-resistant stock. It seems that all beekeepers wanted was a pill to feed their bees to keep them disease-free. I pulled against this tide and gave many lectures to beekeeper groups and wrote numerous articles about the use of disease-resistant bees. It has always been my belief that we should avoid placing chemicals in our hives, a practice with the potential of contaminating the honey and wax.

The third person who has tested

The PACKAGE CHRONICLES

Part 3

Richard Dalby

By now my package colonies are rearing their second brood cycle. The original bees that came in the packages are now being replaced by new bees.

May 21 (Sunday) – Life as a beekeeper has its own surprises. This morning, a man I know found a swarm clustered on a tree limb in his backyard. Failing to find me, he hunted up my brother and told him of the surprise visitors. My brother, an old hand where bees are concerned, got an empty hive, went with the man and hived the swarm, much to the delight of the man and his family, who watched the whole procedure from the safety of their house. The swarm was clustered perhaps seven feet from the ground, so my brother simply shook them off the limb into the waiting hive, which he had put in a wheelbarrow. My brother told the man that the hive would have to remain there until after dark to avoid leaving stragglers behind. Later in the day, when my brother and I went to check on the swarm, they were flying busily into and out of the hive entrance like any normal colony. As swarms go, it wasn't a big one, but a swarm is a swarm, and much to be desired. As the old beekeeping rhyme has it, "A swarm in May is worth a load of hay." I don't know just how much a load of hay goes for these days, but it's a fair amount, for certain. This swarm will make up for the package colony that has developed laying workers. I'm back to having 12 new colonies of bees.

After dark, way after dark, Bill

and I, the stealth swarm removal team, go to pick up the newly hived swarm and move it to my apiary, which is just a few blocks away. Bill has been telling me tales of lost gold mines and such, and that is why it is rather late. But no problem. There are no lights on at the man's house, so we wend our way with the aid of a flashlight around the carport into the backyard, where the hive sits waiting. Carrying the hive carefully, Bill at the back end, me at the front, we make our way back to the truck and lift the hive onto the truck bed. We had brought a smoker along, but decided not to light it unless the bees proved to be a bit touchy. But nary a bee has ventured out the hive entrance. We return to the backyard to retrieve my brother's wheelbarrow, then drive to the apiary and unload the swarm. I have a hunch I am going to like these new bees a lot. Not only were they free, except for the hiving and moving, but they seem to be very gentle, too.

May 22 (Monday) – In the afternoon I go to the apiary, transfer the swarm into a better hive, and give them some better worker comb. Bill shows up to do some sheep wrangling. He is in the process of shearing his flock of Navajo sheep, a breed derived from the sheep that came to the New World with Cortés. The black locust trees around town are still in blossom, and I am amazed

how much nectar the swarm has gathered in just one day. The package colonies are doing great, too. Their population is increasing rapidly now as the first brood cycle hatches.

There was a plane out spraying alfalfa again early this morning, but my bees appear untouched this time around. Long-term, I'm betting on the aphids unless farmers adopt a better method of controlling them. As I work, I muse on the fact that the interests of farmers and the interests of beekeepers are not always the same, though it would seem that farmers and beekeepers should be natural allies, and sometimes are. But modern farming practices (cutting alfalfa before it blossoms, monoculture with its attendant use of insecticides, the elimination of "weeds" which supply pollen and nectar) are generally inimical to beekeeping. Yet sometimes there is a bright spot. Last year a local farmer planted a field of safflower within the flight range of my bees. This provided a good deal of the honey crop I extracted.

May 24 (Wednesday) – A warm Spring day, up to 84 in the early afternoon. Perfect weather for bees to work black locust blossoms. Yesterday I added two frames of worker comb to each package colony. Now they all contain eight or nine frames. They are all coming along nicely.

At about 6 o'clock in the evening a storm rolls in from the southwest. The clouds look huge and ominous, even from a distance. As they move closer, the air becomes very still for a time. Here comes the wind with a fury. And then it begins to hail, the marble-sized hailstones slashing down, bounding on the sidewalk, stripping leaves from the apricot tree, from all the trees. The hail lasts for perhaps two minutes. It seems much longer. Then the hail turns to rain, the storm rolls on up the valley, and the sun comes out again. But the damage has been done. The locust trees have been stripped of most of their blossoms. The ground beneath them is white with blossoms, as though it had snowed. The black locust nectar flow is obviously over. Well, at least my bees had a few good days to put in some nectar. Perhaps next year, this year's package bees will gather in a crop of that wonderful black locust honey.

By now my package colonies are rearing their second brood cycle. The original bees that came in the packages are now being replaced by new bees. And some of the package colonies are already emerging as superior to the others, though they all have been treated alike to this point. But this is typical, due mostly to genetics, although other factors play into it. Rearing queens is both a science and an art, and small details can have a large effect on the resulting queens.

May 28 (Sunday) - The weather has turned very warm, setting records around the state of Utah. It was 92 degrees here in the afternoon. My bees are working on the few remaining black locust blossoms and on scattered roadside patches of yellow sweet clover.

June 1 (Thursday) - Last night the temperature fell to 40 degrees, rather chilly for this time of year. A spray plane was at work east of town early this morning. Apparently the alfalfa aphids have not yet been vanquished. I talked to a farmer friend of mine today at the local store. He told me the hailstorm did a lot of damage to the alfalfa, so he will probably cut his first crop early to minimize his loss. There seems to be little for the bees to work on right now, though there are patches of alfalfa and yellow sweet clover here and there.

Most of the package colonies are about ready for their second box. All things considered, they have come along quite well, and I am pleased with their progress.

A woman at the store asks about buying a case of honey to send to friends. I tell her I will have honey in August or September and to check back with me then. But I realize that perhaps my package colonies will gather no surplus honey this year. Much depends on the usual variables of weather and honey plant availability.

June 6 (Tuesday) - Some farmers have already cut their first crop alfalfa, the large rectangular ton bales in the fields ready to be hauled. The small bales of hay that weigh from 50 to 80 or so pounds are now not as common as they once were. Almost all areas of agriculture are becoming bigger and more mechanized. Whether this trend bodes well for the future is certainly open to

my door to ask if I have any honeycomb. She has read that honey in the comb is good for allergies. I tell her I have no honeycomb at the moment but sell her a small jar of unheated honey from last year with the hope that it will help her.

June 27 (Tuesday) - The package colonies are doing well, although they are not as strong as I had hoped they would be by now. I wish now that I had fed them when they were hived, as all the books recommend. The basswoods began to bloom about a week ago, and my bees have been busy in them every day since, but the hives when I left them from the rear still seem rather light. Rained hard yesterday afternoon with a bit of hail, but the stones were small and did little damage. The rain should help the clover and other honey plants.

July & August 2000 - By early July, eight of the package colonies are strong enough to super, and su-

A hive of bees offers you a window into the workings of the natural world. All this and a honey crop, too. So get your package bees (or your nucs) ordered. Get your equipment ready. Get to it now. Spring's coming.

debate. At any rate, a man farming one acre of land would now be hard to find. But there are still plenty of beekeepers with just one or two hives of bees. Beekeeping is one of the few remaining agricultural pursuits where a person can start small and stay small and still be richly rewarded both materially and spiritually while doing something very positive for the environment. A lot like a backyard garden.

The weather has turned out warm, with record heat across the state yesterday. I checked a nearby basswood tree today. The nascent blossoms look to be about two weeks from opening. There are seven basswood trees near my apiary, and my bees work their blossoms avidly every year. While out scouting the landscape I discover a large field of safflower right on the edge of the normal flight range of my bees.

June 7 (Wednesday) - Another day of record heat. A lady comes to

per them I do. The wet comb draws the bees into the supers right off, and I expect the supers to be pretty well filled by the end of July. But the weather turns out to be hotter than normal during July and August, not only here but all over the West. A giant high pressure system parks itself over the western states, so we receive no rain. Blame it on El Niño. Or is it La Niña? While the West burns, with the worst forest fire season on record, the East gets rain almost every day.

The bees seem to be busy whenever I check them, but no honey appears in the supers. As August fades into early September, and the days grow shorter, it becomes clear that I will have no honey crop this year. I hear through a friend that a Colorado beekeeper of his acquaintance also got no honey this season. Yet a beekeeper I know in the next county got a nice crop of clover honey. So the nectar gods did smile

Continued on Next Page

this year on some. Well, that's the nature of most agricultural pursuits, including beekeeping. The weather still plays a large part in the equation, and we have little control as yet over the weather. But that's part of the adventure of being a beekeeper. No two years with the bees are ever just the same. In fact, no two days are ever just the same with the bees, even if you have just one hive. That's part of beekeeping's enduring appeal.

August 31 (Thursday) - While installing entrance reducers on the package colonies, I discover that a late-Summer swarm has come from somewhere and taken up residence in an empty hive. They fly busily in and out, coming and going rapidly, as though they sense the lateness of the season. I am cheered to find I have another hive of bees. They cost me nothing, and they even hived themselves. With a bit of help from me, in the form of several frames of honey, they should Winter well. Next year (like any true beekeeper, I am already thinking of next year), this welcome colony might gather gallons of honey.


September 4 (Monday) - In the warm afternoon a woman comes to my door. She and her husband and two children are heading home after a Labor Day weekend outing. The woman tells me they live in a town some 100 miles from here. She is looking for an extractor, and someone at the local store told her I might

have one for sale. No, I tell her. I don't. But I tell her to check a regional paper where I remember reading an ad recently for used beekeeping equipment. We talk for a few minutes about (what else?) bees. She tells me she caught a swarm in the Spring to launch her beekeeping career. "I got eight and a half gallons of honey from them a couple weeks ago," she says with enthusiasm. I'm impressed and tell her so. "I think I could make an extractor," her husband says. "He wasn't too certain about this bee stuff," the woman jokes. "But when he saw all that honey, he became a believer." I tell them there have been articles in the bee journals detailing how to make an extractor and I suggest they write to the editors of the journals for more information. Had we had more time to talk, I would have told them how valuable a bee journal subscription can be to any beekeeper, whether novice or old hand.

After my visitors leave, I reflect on the fact that women have long been beekeepers and long been good ones. I also remember that it was a meeting with a chance swarm that launched A.I. Root on his illustrious beekeeping enterprise all those years ago. Even in this technological age, the magic of the honey bee endures.

September 10 (Sunday) - Now for the good news. Though I will have no honey crop this year, all of my package colonies are much heavier now than they were just two weeks ago. There seems to have been a

late-Summer flow from some source, probably alfalfa, and the bees packed the brood chamber with honey for Winter. Four colonies that were laggards earlier in the season have now come into their own. And the swarm that my brother hived for me back in May is now the equal of any colony in the apiary. Things are looking good for next season.

September 15 (Friday) - A warm day for this time of year, up to 90 degrees in the afternoon. The bees are still bringing in lots of pollen from the rabbitbrush. And the pungent scent of rabbitbrush nectar wafts from some of my hives. All this late-season activity is providing the package colonies with the pollen and honey reserves they need to raise next Spring's bees. And, when April rolls around again, I plan to split my 14 hives, supply each split with a fecund young queen, and have 28 hives in my apiary. And with those 28 hives, I plan to gather a honey crop of epic proportions. Such are a beekeeper's dreams. If you're already a beekeeper, you understand such dreams. If you're not, well, you should know this. Beekeeping never gets boring. It's always a bit of an adventure. A hive of bees offers you a window into the workings of the natural world. All this and a honey crop, too. So get your package bees (or your nucs) ordered. Get your equipment ready. Get to it now. Spring's coming. 

Richard Dalby is a sideline beekeeper and freelance writer living in Levan, UT.

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VARIETAL HONEY

You can produce different honeys this year.
Here's how.

Ann Harman

Now! Decision time has come. It's March and time for you to think about exactly what varieties of honey you will be producing this year. While the weather is still uncertain and bee work confined to days of better weather, mentally review your bee yards to see just where they are in relation to the nectar sources. What opportunities are there for producing and promoting several kinds of varietal honeys? Consumers are becoming much more aware of honey colors and flavors. If you have not observed this in your area, perhaps you need to start the education of those customers. What better time than this year! But you will have to make preparations ahead of time to achieve a few varieties. Even two different kinds of honey will enlarge your possibilities for increased income.

You will have to be familiar with the different nectar sources within a reasonable distance of your extracting facilities. You can think of your honey house as the center of your honey bee universe. Some hives may well be just outside your back door at the edge of a wonderful forest or fields of clover. But you can establish outyards, either temporary or permanent, at different compass points to take advantage of entirely different areas.

Along with the knowledge of where the plants are, you need to have the knowledge of when and how long the nectar flow is. It can certainly be worth taking advantage of a short nectar flow for a particular plant that produces a desirable honey. Let your customers know that a particular honey is scarce but highly prized – and charge more for it, whether wholesale or retail.

In fact, if you have a nectar

source in that "scarce but highly prized" category, don't even think of blending it with something else or even selling it for blending. Keep the emphasis on the scarcity and distinctive flavor. As consumers become more aware of honey flavors, requests for particular flavors will appear.

You can encourage your customers to buy more of their favorite flavor that is in short supply. If you inform them that the quantity is limited, that you will probably not have any to sell after say mid-August (or whatever month you estimate the supply will be exhausted), you can then suggest that they buy their year's supply when available. However, the secret is to insist that they put that supply in the freezer for long-term storage. If this prized honey does not crystallize, then it is not necessary to heat it and possibly destroy some of the flavor. This approach is no different from someone who buys cases of wine for future use and stores them in a cool, dark place such as a cellar.

But we are ahead of ourselves. So far we have established different nectar sources and their nectar-producing dates. You will have to make some decisions now. How many hives do you want to put at one location? How many will that location support? Go ahead and be a bit greedy by adding a few more hives, especially if this is your first year at a chosen outyard. Although you will want to make a sensible distribution of hives, consider this first year of varietal honey an experiment.

You probably will be running back and forth between your specialty outyards more this first year than in the future, as you learn to "read" the plants and the conditions.

But in the end you will have a better picture of those outyards and can basically ignore them once the supers are on.

While it is true we can make all sorts of plans, you can be certain that Mother Nature will decide whether cold, wind, drought or excess rain are called for. Yes, it is discouraging when a honey crop is wiped out. But having more than one apiary can rescue a bad situation. Thank goodness flowers bloom at different times. See if your yards provide you with a succession of bloom.

Before we get too far along with this project, I would like to point out that keeping this universe of beehives going depends on keeping good records. Don't fuss! If you are not a record keeper, can you really say when a good nectar plant bloomed in your area last year? As beekeepers, we should be familiar with microclimates – small areas that seem to be different from what is considered normal. Such areas can be really helpful for the overall honey crop. One outyard may be two weeks ahead of another with the same plant – two different outyards that can yield an increased honey crop.

Now for some equipment considerations. It is possible that more honey supers will be necessary. On the other hand, supers from an early crop can be extracted and used for a later one. Remember those records you are keeping? They will not only help you keep track of when plants bloom but also the succession and time between different blossoming periods. A succession of bloom enables you to save money on supers and also saves on out-of-season equipment storage. But don't scrimp on supers. Remember, empty comb

stimulates nectar collection. Give those bees space to put nectar.

It is relatively easy to assess what bees have put in supers. You are removing the filled, capped frames one at a time from a honey super. This gives you a chance to evaluate visually the color of the honey, which is a clue as to its type. However, bees are independent little critters and are perfectly satisfied with putting some light honey and some dark honey on one frame. A frame like this is not compatible with separating honey by variety. What to do with it?

Well, don't ruin your separation of varieties by just sticking it in the extractor as is. Set it aside and go on with uncapping and extracting. You may well end up with several or many frames with mixtures. Depending on the number of those frames, you have some choices. Extract them, keeping that honey separate from your selected varieties. What to call this honey? Give it some special name - "Summer Meadow Blossoms, blended to perfection by honey bees." Then sell it for more than you would ordinary wildflower.

In some cases you may need to taste the two different honeys on the frame. Suppose one tastes horrible. Well, give it back to the bees or sell it as bakery honey. At least the horrid honey has not contaminated your choice varietal. Now maybe you should take a good look at that particular outyard. So often we notice only the plants in the vicinity of the apiary site. What did the bees find that you did not? Was there some yellow rocket over that hill or perhaps a privet hedge? Even if you cannot find the source of some rather inedible honey, this outyard should be crossed off the list. At least you have other nectar sources.

In your search for outyards you may encounter a landowner who says "no" to your request to put hives on his land, near that choice nectar source. You may not be able to obtain that particular outyard this year, but you can make some plans for next year. When that particular plant comes into full bloom, invite the landowner to come with you to take a look at the blossoms. Sometimes pride of ownership of the source of a desirable honey will make the landowner change his

"Better Records, More Work, More Money!"

mind. If possible, take a gift jar of that particular honey to help emphasize how really desirable it is. And promise to maintain his supply throughout the year.


If you usually put your honey in drums or pails for someone else to put in jars for retail, you may wish to consider several alternatives with a particular variety of honey. If you have been successful in having a few drums of a choice honey, see if the packer is interested in promoting a specialty honey. That honey may require a different label and a new retail outlet, but the increase in price may well be worth it. Or you may wish to keep your drums or pails of a specialty honey, bottle it and find the gourmet and tourist shops yourself.

Let's go back to the landowner who said "no." If you are bottling your own honey, or just specialty honeys, consider using the landowner's farm name as part of the honey label. You can use such terms as "honey from the fields of ..." or "honey from the groves of ..." but use your name as producer.

Is it worth having a collection of labels that indicate your varieties of honey? Sometimes beekeepers use rubber stamps, but these take a steady hand and a good clean stamp, not one that has gone squishy with use. Small labels can be printed that have varietal names, but these little additional labels must be compatible with your basic label or they look out of place. If you decide on these, put them on straight!

We all seem to be in a "work smarter, not harder" phase. Keeping honey varieties separate, maintaining several outyards, extracting more than once a season all seem to appear "harder" instead of "smarter." Perhaps the first year of rearranging your honey collection to take advantage of varieties will be harder. However, at each step, consider whether you can find a smarter way of approaching your honey harvest.

One task in the smarter category is to think through costs, particularly of equipment. Perhaps we should enlarge the category of equipment to include trucks and ways to load hives and supers. Have you wanted some piece of equipment for years and keep putting it off? So you are working harder. Are you good at marketing on the retail level or is it smarter to have someone else do that? Can you justify increasing your number of honey supers? Sharpen your pencil, find some paper and start balancing what you are doing now and how you can take advantage of at least two varieties of honey in your area.

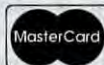
Do customers want variety? Just look at the jam in the supermarket. You will find grape, strawberry, apricot and even some unusual fruits. Those have been on the market for years. It is time honey joined the assortment offered to customers. You can make it happen. 

Ann Harman is a sideline beekeeper and international marketing consultant.

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GOLDEN HARVEST

Lloyd Spear




Last month we discussed why pollen is such a great food for your bees and how to feed it. I think that most hobbyists could greatly increase their satisfaction from keeping bees if they would feed more pollen, so I want to spend some more time on the benefits that pollen brings to bees. I also want to talk some about pollen collection equipment.

Beekeepers understand that bees hatch from eggs and exist in larvae form for the first several days. They cannot find their own food at this stage, but must be fed by nurse bees. Nurse bees prepare what has been termed "bee bread" to feed larvae. This is principally pollen plus nectar and chemicals produced by glands in the nurse bees. It appears that the principal ingredients are the chemicals produced by the hypopharyngeal gland, but pollen is a key ingredient, as is glucose, from nectar. Studies have shown that the quantity of bee bread a larvae consumes is of primary importance to the bee's development, and it is believed that when circumstances warrant, workers deliberately manipulate the glucose content to entice larvae to eat more.

However, the development of a bee does not stop at the larvae form and newly hatched bees must consume large amounts of protein during their first two weeks to complete development of body tissues, muscles and glands. They consume these large amounts of pollen while preparing and feeding bee bread to larvae and by the time they are ready for field work collecting pollen and nectar, they are ready for another diet change. After commencing fieldwork, their diet primarily consists of nectar, but still contains some pollen. Researchers estimate that bees consume much more pollen in the first two weeks after hatching than they did as larvae.


Studies have also shown that the amount of protein that a bee receives as larvae and as a young bee has a direct relationship to the number of workers she is capable of raising as a nurse bee, the eventual weight of those workers, and their life span. In other words, bees fed amounts of pollen sufficient to make them strong and healthy with a long life span are capable of producing more bees with such characteristics...if they have enough pollen.



When a beekeeper makes a split or installs a package, she is starting with 7,000-12,000 bees. (A pound will have about 3,500 bees, so a typical two-pound package will have 7,000 bees. Splits from one's own hive may have more or fewer bees than packages.) The colony will not be capable of collecting more nectar than daily needs until it reaches more than 30,000 bees, and cannot reliably collect excess to en-

able a honey harvest until the population reaches over 40,000 bees. If started on foundation, the bees must collect all pollen and nectar to construct comb and feed larvae and young bees. Moreover, they must do this during a time when the number of bees is declining every day, due to death from natural causes. Studies have shown that bees from packages installed on foundation actually show a population decline for the first 30 days, and actually lose almost 50% of their population during the first 20 days!

All publications advise feeding honey or syrup to new packages or nucs, but few advise feeding pollen. Yet, pollen, with its high protein content, is far more important to the larvae and young bees than is honey or syrup and its carbohydrates. Actually, both should be fed. Pollen by making cakes as described last month, and syrup or honey in liquid form.



To a new beekeeper, the only thing more discouraging than a hive full of bees in the fall, but no honey, is the first warm day in April or May that lets her know that her bees starved to death.

This is not usually because of insufficient bees. After all, most hives are full of bees in the fall. Instead, it is usually because there was not sufficient bees to collect nectar during the summer. And that was because the population could not build up fast enough in the spring. To get that buildup, all nucs or packages should be fed syrup (or honey) and pollen.

How long should this feeding continue? Some say, "until the bees no longer take the feed". However, I have seen bees always take the feed (and build huge populations that swarm). A better guide is 30-40 days, or until it is time to add another hive body or super, whichever is sooner. By the end of 30-40 days enough bees will be hatching to more than replace those dying natural deaths. From this point, if there is warm weather and a normal flow of pollen and nectar the hive will be capable of continuing to increase and, if it was started early enough, to collect enough stores for the winter.

Just as all nucs or packages should be fed pollen as well as honey or syrup, so should hives that are observed to be relatively weak in the spring. Now, commercial beekeepers will not bother with these weak hives, knowing that they will almost certainly not produce a surplus. They will combine weak hives with a strong hive. (Never combine two weak hives. Doing so just produces one weak hive!) However, a hobbyist knows she has the equipment investment in place, may have fully drawn combs, and doesn't care that much about surplus honey. In this instance it may be appropriate to treat the weak hive as a nuc, and feed it pollen and honey or syrup to speed development and let it survive the next winter. (It is always a good idea to replace the queen of a hive that over winters but is weak in the



Examples of external pollen traps.

spring.) Also, you need to know that a hive is not troubled by pests or disease. All the food you can provide will not make up for inadequate colony health.

Hives should also be fed to speed development when they are being used for pollination and when they are used as starters or cell building colonies for queen production.

Ok, we know that it is preferable to feed syrup or ones own honey to minimize the chance of disease. Bees will take the pollen substitutes on the market if enough sugar water or corn syrup is mixed in, but pollen is much preferred and much better for them. It is highly unlikely, at present, that a beekeeper can buy local pollen from safe sources as such pollen is almost certainly hoarded for the beekeeper's own use or sold for extravagant prices. It is time to collect ones own pollen. How to do that?

It would seem obvious to collect pollen by going to the pollen producer. That is, the flowers produced by plants or trees. The enthusiasm for doing that usually lasts for less than six flowers. It is incredibly hard to get the pollen into a bag as it usually doesn't want to shake in and, besides, each flower contains an infinitesimal amount. However, if we live in the right area loads of pollen can be collected from corn plants or pine trees. In fact, quantities of pollen from such sources can be so great that at certain times of the year fields, autos, driveways, and lawns can be turned yellow. Surely, some of that bounty can be collected? Yes it can or could, the only problem being that such wind borne pollen is nutritionally worthless! (At least one author claims evidence that large amounts of imported pollen are from such sources.) So, in order to have pollen a beekeeper must collect excess from her own bees, just as she does honey. She can best do that by purchasing a pollen collector (commonly known as a pollen "trap") of a successful design. After observing and learning, she can then make an intelligent decision whether she needs or wants additional traps or wishes to copy the design and make her own.

I have studied all or most of the pollen traps on the U.S. market today, as well as over a dozen home made designs that are not commercially made. They all share two common characteristics:

1. They collect some of the pollen that a bee attempts

to bring into a hive.

2. They do not collect so much pollen that a hive will go into decline because of a lack for their own use.

From there, they differ enormously.

During a recent discussion, John Edwards, a technician with the United States Department of Agriculture Honeybee Research Laboratory in Arizona said those considering a pollen trap should consider:

"A screen bottom in the pollen tray is a good idea. Try to avoid pollen trays that pull out from the hive front - the bees don't like that. Side trays are workable, but rear access trays will allow the hives to be closer together, and generally work out better. The disadvantage of the full-size (bottom mount) traps is that the whole hive has to be taken apart for the initial installation, but after that, there are ways to slide out or tip up the screen, and the trap body stays in place; the metal screen can also help keep mice out. Some traps have built-in drone escapes these usually work out fine, and keep dead drones from building up on the bottomboard. There are also "external" traps, which attach to the main entrance or at a gap between boxes above the entrance. They are not usually as efficient, and tend to be fragile."

To John's list of desirable conveniences I would add:

1. A method of keeping most or all dead bees, wings, varroa, twigs, chalkbrood mummies, etc. out of the collected pollen.
2. A method for the bees to leave the hive without going back through the pollen trap.

Before proceeding further, I need to remind you that my wife and I own Ross Rounds, Inc., which manufactures and sells equipment for the production of comb honey and the Sundance™ pollen trap. In preparing the following comparative information, I have tried (and perhaps bent over backwards) to avoid any prejudice toward the Sundance™ trap, but you will have to finally decide whether I have been successful.

Table 1 lists the desirable attributes and the relative selling price of some of the various commercial pollen traps offered by dealers today. The comments indicate whether the attribute is present, generally absent any evaluation.

Some words of explanation are in order:

1. Two general types of front access traps are offered. One made of wood and the other of plastic. Where there are two comments, the first is for the trap made of wood and the second is for the trap made of plastic.

Attribute	Front Access	CC Pollen	Sundance™
Screen Bottom	Yes, limited	Yes	Yes
Bottom Mount	No	Yes	Yes
Easy change to free flight	Yes	Yes	Yes
Drone escapes	No, Yes limited	Yes-limited	Yes
"External Trap"	Yes	No	No
Rear Pollen Tray	No	Yes	Yes
Debris in pollen	Yes	Yes	No
Worker bee exits without going through trap	No	No	Yes
Initial cost	Moderate	Moderate-High	High

2. For the most part the attributes are listed as simply "present" or not. For example, all three types of trap have a system for redirecting the bees so that pollen is or is not collected, without taking the trap entirely off the hive. However, these systems differ substantially as to design durability and ease of manipulation.

A short description of each attribute is as follows:

Screen Bottom – In most parts of the United States and Canada, summer humidity will result in pollen molding and breaking down unless there is a reasonable amount of air movement. For this reason, a screened bottom to the pollen tray is important.

Bottom Mount – Bottom mount traps require lifting the brood nest and supers in order to put the trap on the hive and remove it. Each is generally done once a year.

Easy Change to Free Flight – Whether the bees can be easily redirected so that pollen can and cannot be collected without removing the entire trap from the hive.

Drone Escapes – It is generally felt best if drones can easily get out of the hive.

External Trap – An External Trap is one that is somehow fastened or sits outside the hive.

Rear Pollen Tray – If a beekeeper has access to the pollen tray from the rear, she can collect pollen without a veil or other protection.

Debris in Pollen – Does normal hive debris, such as dead bees and chalkbrood mummies have an opportunity to get into the collected pollen? Some or all will have to be removed before feeding, consumption, or sale.

Worker Bee Exits – Most traps require the worker or field bees to go back through the pollen stripping apparatus to get back to the field.


Initial Cost – In my opinion, today's pollen traps sell for just about their relative value. The longer-term values are not addressed in this table. However, a pollen trap is a tool for a beekeeper. Measured over time, the lowest cost tools are often those with the highest initial cost and there is no reason to think that pollen traps should be any different.



Internal, bottom mount trap.

Last fall I tried several different pollen traps in one of my own apiaries. I had different design traps on adjacent hives judged to be of equal strength. When I observed significant differences between the amount of pollen collected, I switched traps to ascertain whether the difference was due to trap design or to basic pollen collection. I observed significant differences in the amount of pollen collected in traps of different design.

The bottom mount traps collected significantly more pollen than the others. When the bottom mount traps were collecting a pound a day, the front mount traps were collecting four ounces or less. Yet when the traps were switched, the hives collecting four ounces or less a day began (within 2-3 days) collecting a pound a day and the hives collecting a pound a day immediately started collecting four or less ounces. As I tried to be certain that bees could not enter the hives without going through the traps, I concluded the reason for the lower collection rates was decreased activity. Apparently, and I am surmising this, since the front mount traps require the bees to exit through a relatively congested pollen trap, substantially fewer bees fly.

Next month we will spend a little more time considering why beekeepers might collect pollen, discuss some of the claims made for the use of pollen as a food, and consider how to clean pollen. 

Lloyd Spear collects and sells pollen in Guilderland, New York. He is the owner of Ross Rounds.

?Do You Know?

Answers

- True** The central nervous system of the honey bee consists of a brain and a ventral nerve cord. The ventral nerve trunk consists of a row of seven ventral ganglia or nerve masses joined by paired longitudinal connectives.
- True** Being able to train bees to visit specific food sources (dishes of syrup) has enabled scientists to learn about the bees communicative dances, preferences for different types of sugars commonly found in nectar and their ability to distinguish between different sugar concentrations.
- False** Drones locate the queen during her mating flight by perceiving her attractive pheromones. During flight the drones, strongly stimulated by pheromones from the virgin queen, fly upwind until arriving sufficiently close to respond to the visual stimulus of the queen.
- True** The odors associated with flowers, and their nectar and pollen sources are very important in helping bees select specific floral sources in the field. Being able to differentiate between different floral odors plus the communicative dances, allows the bees to locate the most profitable floral sources.
- False** Secondary colony reactions to smoke include a reduction in the number of guard bees at the colony entrance and a decrease in the number of foragers leaving for the field.
- True** Most of the sensory nerves of the exoskeleton end in cells at the bases of hairs. The hairs being delicately poised are easily moved by contact with objects or currents of air. These innervated hairs and associated sense cells constitute organs of touch.
- False** Even with a complete cloud cover the bees can indicate the solar angle of the food source correctly during the wag-tail dance on the vertical comb surface. The forager's internal clock enables them to know the time of day and the position of the sun. Bees are also able to perceive ultraviolet radiation from the sun through a complete cloud cover.
- True** Extensive research has shown that bee pheromones contain many chemical components that have not been totally identified or functions determined yet. At least 13 different chemical components have been identified from queen substance and 7 components to the Nassenoff pheromone.
- True** Research has shown that direct contact with the queen or with workers that have contacted the queen is necessary for inhibition of worker ovary development. When a colony is divided by a single wire mesh screen, ovary development will not occur in either part with or without the queen. When a double screen is used so that bees in the queenright and queenless parts cannot contact each other, the ovaries of workers in the queenless part will develop.
- B) Corpora allata
- B) 5.0%
- When worker honey bees become disorientated and expose their Nassenoff or scent glands. Temperature in the hive becomes too high. As the carbon dioxide level increases in the hive. Cells of unripened honey are present.
- Worker honey bees quickly respond to the loss of their queen by becoming nervous, aggressive, with increased walking throughout the colony. A "roaring" sound can be heard upon opening queenless colonies due to increased scenting behavior. They begin the construction of queen cups in the colony followed by emergency queen rearing, generally beginning queen cell construction over cells containing larvae or eggs.
- The quality of the food resource is communicated to potential foragers by dancing honey bees by the liveliness and vigor of the dance as well as duration. The more attractive food sources

elicit more vigorous and long-lasting dances.

- Touch, Taste, Smell
- Drone
- "Queen substance" is really a complex of more than a dozen chemicals that are produced by the mandibular glands of the queen. The queen's pheromones are dispersed over her body surface when she grooms herself. The retinue of workers that encircle the queen obtain the chemicals by licking her body or touching it with their antennae. The chemicals are then shared with other members of the colony in regurgitated food.
- In order to defend their colony, guard bees must be able to distinguish workers from their own and other colonies. Odor is the primary stimulus used by guard bees to recognize intruders. All adult bees in a colony share the same odor which is different from that of any other colony. In addition, the behavior of the bee they are examining is also used by guard bees to determine if they are friend or foe. Some intruders fight back or attempt to escape while others exhibit a submissive behavior during examination.

Check the table below to determine how 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

Clarence Collison is a Professor of Entomology & Head of the Department of Entomology and Pathology at Mississippi State University, Mississippi State, MS.

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ties, as that organization struggles with the changes in U.S. agriculture, funding support and the public's perception of food production in this country.

No matter the outcome, my professional life has been enriched by people like Chuck Koval, Eric Erickson and now John Root. Their influence on this magazine stands tall, and we are all indebted to their dedication to public service.

•
Awhile back we reported on the problems some wholesalers were having with some retailers in the area of slotting fees. In case you are not familiar with slotting fees, they are, generally, a fee a store will charge you when you want them to sell one of your products. For instance, if you want to get your honey in a particular store (generally one of the large chains), they will charge you something like \$2000.00 (or more) to make it happen. And that may be for only one row of one product, say, one row of one pound jars of clover honey. If you want two rows of one pound clover honey, and one row of two pound clover honey, it will probably cost you a lot more. This fee, it is said, covers the store's expenses in getting your product(s) into the computer system, warehouse paperwork, inventory costs and the like.

After some time period, the store will evaluate the sales of your product(s) and if not enough has sold, they remove it to make room for a more profitable item. You don't get your money back and you no longer have a spot on the shelf. It can be an expensive experiment for you. Not the store.

The newest wrinkle to come to light is that some stores, or some managers in some stores, were actually charging some wholesalers extra for the privilege of selling their product. And putting that extra in their pocket. Cash that is. Some have been accused of being a bit more subtle and requesting extra free cases to sell, extreme discounts on the first few sales...all of which fall under the general heading of extortion. Enough wholesalers were being taken advantage of that they actually got congress interested and there was a hearing held to investi-

gate the problem.

Surprise. Not one retailer showed up. Not one wanted anybody to investigate these accusations. Worse, when under that intense spotlight, most of the wholesalers were less than damning about the situations they were facing. It seems that if you point a finger at someone, who just happens to hold the key to your ability to stay in business, you better have a plan B in place because you can bet you won't be selling in THAT store much longer - proof of injustice or not.

One of several arguments large honey packers have against selling varietal honeys is that they have to have several 'fronts' on a shelf, which, in large stores, have a slotting fee attached to each. And they have to experiment with each variety to see what sells where...does California Starthistle sell as well in Salt Lake as it does in Seattle? It will cost you a couple thousand bucks to find out. What about tupo in Tempe? Or sage in Saint Paul? It's an argument that has some merit. Moreover, some, in fact most varieties are somewhat seasonal, so they aren't even around all the time. Thus, for some stores, when one variety goes out and another comes in another fee must be paid. Now not all stores are this tough, but some are, and some are worse. When it comes to seasonal product and getting dumped on, you should listen to the people who sell produce. They really have this problem.

Meanwhile, the slotting irregularities go on, and with the consolidation binge that grocery chains are on it will no doubt get worse before it gets better, if ever. If you have concerns about this, or your products are in the line of fire you may want to touch base with Sen. Christopher Bond (R-MO), 202.224.5721 who is leading the Senate investigation on this.

•
Here's some data on crop production in the U.S. last year. All these need (and should be using honey bee) pollination at about one colony per acre. Of course there are far more crops...these are just the veggies and field crops.

In 2000, there were 1,570,000 acres of canola, up 46%, with a 134 lb./ac yield. There were 215,000

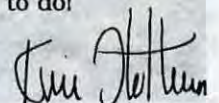
acres of safflower, 1,434 lb./ac, down 22%. Sunflowers grew on 2,790,000 acres, down 21% but producing 1363 lbs./ac. Peppermint produced 77 lbs. of oil/ac, on 89,500 acres, while spearmint produced 101 lbs. of oil/ac on 21,700 acres, down 11% from last year.

Fresh veggies need honey bee pollination to produce, and you could be part of this action. There were 109,130 acres of cantaloupes planted last year, yielding 20,282,000 lbs., worth \$359,417,000. Fresh cukes grew on 60,480 acres, producing 20,800,000 lbs. worth \$234,464,000. Honeydews generated \$106,579,000 from 19,600 lbs. produced on 28,600 acres. Bell peppers grew on 71,900 acres (producing 276 lbs./ac) for a total of 19,525,000 lbs., worth \$614,375,000. My favorite, watermelon, was grown on 189,360 acres, producing 37,152,000 lbs. (one watermelon is considered 25 lbs.), worth \$236,382,000. Chile peppers, new to the government stats this year, were grown on 33,200 acres, producing 2,994,000 lbs. worth \$118,828,000. That's a lot of salsa. Pumpkins are newly reported this year also, grown on 38,700 acres, producing 8,949,000 lbs., worth \$101,597,000 - jack-o-lanterns everyone.

Processing crops, that is those that are canned or frozen or something to make them last are valuable, but the biggest crop by far is cukes for pickles. All the rest are pretty small. These cukes were grown on 108,210 acres, producing 613,160 tons of pickles, worth \$164,956,000.

If you add all these up, and figure an average of one colony used on three acres (one/acre, three times), there should be roughly 800,000 colonies used for vegetable crop pollination this summer. This doesn't count tree fruit, small fruit and the like. Just vegetables. That comes to, by the way, 86% of all of the colonies in the U.S., used on these crops . . . if growers actually used them. Just for vegetables.

So. Get your pickup or flatbed in shape, your contracts signed and get ready to make some money. Summer is just around the corner and we have a job to do!



WINTER-KILLED COLONIES

Cleaning & Recouping

James E. Tew

The Phoenix Beehive

Winterkilled colonies are a beekeeping fact. It seems that no matter how dedicated an effort you make, there's always a colony that is insistent on dying. I've made previous references to one such colony of mine. The particular colony seemed to have everything needed for successfully wintering.

In general, the colony in question had no business dying, but it did. During late winter and spring, it's a common beekeeper question at meetings. "What did I do wrong?" Most of the time, it was something routine, like starvation or a queen dying, but sometimes good colonies just die and we will never know why. Poor wintering genetics can play a major role. A particular colony looks good in the fall, but turns up dead in the winter. Sometimes you lose.

The Dead Colony's Autopsy Wax Moths, American Foulbrood and Nosema

Depending on your location, various procedures are required to recoup winter losses. In warm climates, the wax moth is a relentless

Some Hive Requirements for Successful Wintering.

1. **A young, productive queen.**
2. **Honey stores that are correctly positioned. (Amount varies with location but generally 40-65 pounds of honey.)**
3. **Four - five frames of pollen near the brood nest.**
4. **Strong population of healthy bees (50,000+).**
5. **Basic hive manipulations performed (e.g. entrance reducer installed, inner cover reversed, and upper ventilation and upper entrance provided.)**
6. **Protected Location.**

taskmaster. The combs are often destroyed before the colony is completely dead. Warm climate beekeepers must be doubly alert or their problem is compounded - they have lost bees and comb. In cooler climates, the situation is still bad, but not so urgent. The first thing you should do with winterkilled equipment is to determine what caused the colony to die. The obvious concern is that spore-forming American Foulbrood (AFB) may have been the problem. If foulbrood has been a problem in the past, contact the state apiary inspector and have a competent assessment made. At times, Nosema is a problem. Unfortunately, Nosema is difficult to diagnosis and the remedy is some-

what expensive. Excessive defecation spotting is an indication of dysentery.

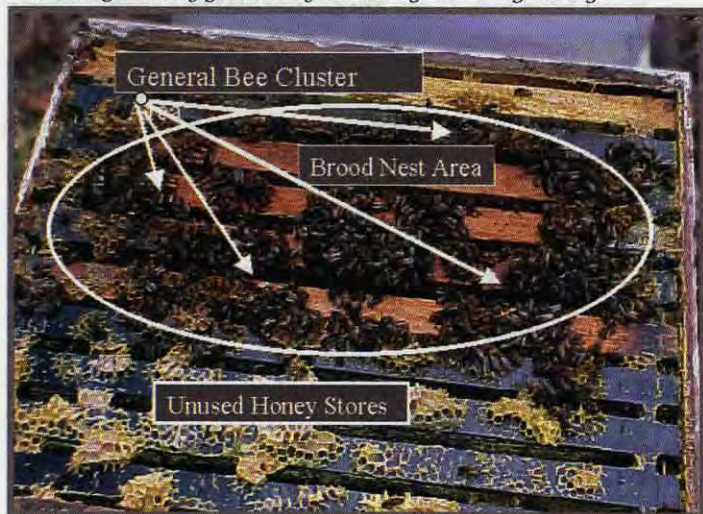
Mites

And there are always mites. Varroa is the greater problem but the debilitating effects of either mite can cause a colony to have low populations of weakened bees. Such a hive is a good candidate for becoming a winterkill. A hive killed by mites during winter months, or any month for that matter, can be safely reused.

Starvation

Starvation has distinct characteristics. The cluster will be in a tight (and dead) group, probably near the center of the colony with single dead bees scattered about. They may be right at the top of the colony, though. Upon removing frames from the colony, many bees will be seen

The biological configuration of a healthy wintering colony.



This colony died from starvation.



in cells with their heads toward the center of the comb. Meager amount, of any honey will be in the colony. Occasionally, patches of honey will be found scattered throughout the colony, but bees were unable to get to it before chilling.

Once the reason for the winterkill has been determined, you need to decide what to do with the equipment. Diseased equipment should be destroyed or sterilized depending on the disease pathogen. Colonies that starved should have dead bees shaken from the equipment and comb as much as possible. True, new bees will remove all the dead bees from the equipment, but critical time can be saved by assisting the bees with the task.

Re-Establishing Hives Spring Colony Splits

You'll probably want to restock your winterkilled equipment. Several techniques are possible. Unless you've had extremely bad luck, some hives probably survived the winter. Depending on the strength of the surviving colonies, bees and brood can be taken from surviving colonies, along with a new queen, and put in refurbished winterkill equipment. The strength of the split is an arbitrary decision you'll have to make. The stronger the split, the more likely the colony will survive the winter. However, the stronger the split, the more likely you'll not get a honey crop from the original colony.

Provide Mated Queens

I always suggest placing a mated queen in the re-established colony as opposed to letting the bees produce their own. If winterkills have been a problem, you should do everything possible to improve your techniques for the next winter. Too much time is lost during the nectar flow if bees are required to produce their queens. Brood and bees from several colonies can be mixed to form a new colony. Smoke or some other disruptive agent (air freshener or newspaper barriers) should be used to mix the bees from different colonies to minimize fighting.

Buying Package Bees

Another common technique for restocking hives is to purchase package bees. This is a simple and proven procedure for getting colonies back into operation. Package producers, listed in the bee journals, should be contacted as early as possible in order to book the arrival date most convenient for your location (figure dandelions and apple bloom time). If bees are all that's needed, queenless packages can be purchased. Colonies that survived the winter in a weakened condition, but alive, can be boosted with the addition of a few pounds of healthy adult bees. Contact individual package producers for the details on queenright or queenless package purchases.

Buying Colony Splits

Colony splits have the advantage of not having the "Post Package Population Slump." After a package of bees is installed, the adult population declines until new bees are produced by the colony. Since brood is included in a colony split, adult population decline is not as great and the colony builds up faster and is better prepared to withstand the upcoming winter.

To the best of my knowledge, there is not a "standard" split. Contact other beekeepers that are selling splits to determine how many frames, how many

adult bees, and how many developing bees are commonly used. Determine if frame replacements are required. It would probably be a good idea to check with the state inspector to be sure the individual has a good record of disease control. Occasionally special deals may be worked out with another beekeeper for you to provide the manual labor required to make the splits. I've heard of prices ranging from \$25 to \$50/split depending on the size of the split and the amount of labor required. It makes sense that on-site pickup of the splits is the norm as they don't travel in the mail well, if at all.

Swarms

I seriously doubt that there's a beekeeper anywhere in the world that doesn't have a slight rise in blood pressure at the mention of a six-pound swarm. In fact, swarms are an excellent way to restock winter killed hives. The only problem is that they are so unpredictable and, due to mite predation, they have become somewhat uncommon. They are also inaccessible at times - requiring great feats of strength, bravery, and agility (maybe other descriptive terms would have been more appropriate here). I must confess that they are sometimes simply not worth the risk. Another confession? Sometimes I hold some winterkill equipment for the swarms that come my way. Of course, they're never from my hives.

The "Dead-Outs"

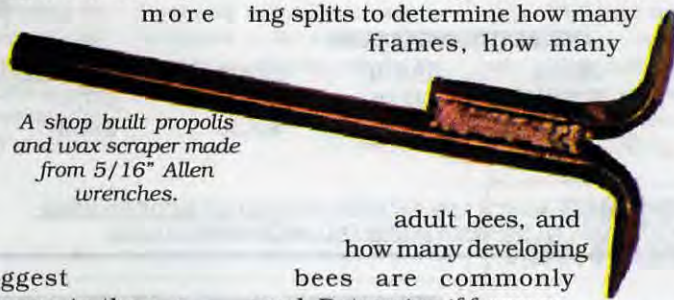
"Dead-Outs" are simply colonies that died during the winter - whatever reason. There are few reasons to wish for colony winterkills, but if it happens, you have a window to perform routine hive maintenance and late winter busy work.

Fix and Repair Old or Busted Frames

Increasingly, I am agreeing with those people, who years ago, were recommending the disposal of old, dark combs. Use common sense here. If the frame is still perfectly useable, then use it, but if it needs extensive repair, is distorted, or has a lot of drone brood, toss it. (Actually, they make great kindling for a fire to keep you warm while working.) The reason for my change-of-heart is the possibility that pesticides are accumulating in old wax and the increased concerns about old combs harboring viral and bacterial pathogens. My general recommendation...use old comb, but don't become attached to it.

Scrape Propolis and Burr Comb

Bees busily apply propolis in the spring; you busily remove it during the winter. While the frames are out, scrape propolis and burr comb so the frame fits more cleanly in the hive body. I'm not sure why, but I always save the propolis scrapings. I've never sold any, but I confess that I do like the smell of fresh propolis.



A shop built propolis and wax scraper made from 5/16" Allen wrenches.

WINTER-KILL ... Cont. From Pg. 41

The propolis and wax scraper shown is built from two 5/16" Allen wrenches welded together. One wrench is cut off to allow a wooden handle to be fitted if desired. The outer ends of the wrenches are ground to a knife edge and ground on the sides to fit the rabbet in supers and hive bodies. The tool makes quick work of scraping out propolis and wax from rabbets and corners of hive equipment.

Repair and Paint

There will never be a better time to scrap, repair, and paint the hive equipment. It's cathartic. From a dead hive, you remodel, restore, and reinstall a new colony. I feel frugal, but a radio and a warm fire help with potential boredom during this winter task. If you mark or brand your equipment, do it now, just before repainting.

The Phoenix Beehive

From the bleak disappointing death of a colony arises the birth of a new, refurbished colony in a clean hive. But not too many deaths. High winter colony losses are indicative of management procedures that need to be improved. But you should be prepared for some colony deaths each year. In fact, all beekeepers can expect some winterkills during some years. Take it in stride and prepare the equipment for the re-establishment of a new colony the next

spring. Thoughts of spring can make the coldest winter day more tolerable. **EC**

Dr. James E. Tew, State Specialist, Beekeeping, The Ohio State University, Wooster, OH 44691, 330.263.3684, Tew.1@osu.edu



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	1-9 ... \$10.50	1-9	\$34.00	\$39.00	\$46.00	\$54.00	
	10-24 ... \$9.00	10-up	\$33.50	\$38.50	\$45.50	\$53.50	

25-up ... \$8.75
MARK. \$1.00 CLIP .. \$1.00

<u>QUEENS</u>	<u>PKGS</u>	<u>2#w/q</u>	<u>3#w/q</u>	<u>4#w/q</u>	<u>NUCS 4-FRAME</u>
1-9 \$13.00	1-9	\$37.00	\$42.00	\$49.00	\$57.00
10-24 .. \$11.25	10-up	\$36.50	\$41.50	\$48.50	\$56.50
25-up \$11.00					
MARK. \$1.00	CLIP .. \$1.00				

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GLEANNINGS

MARCH, 2001 • ALL THE NEWS THAT FITS

USDA ANNOUNCES GOVERNMENT PURCHASES

The U.S. Department of Agriculture announced to the agricultural industry the target list of fruits and vegetables it will purchase in the coming months to bring relief to farmers burdened with critical surpluses and depressed market prices.

Using newly appropriated funds totaling \$200 million in the coming fiscal year, USDA's Agricultural Marketing Service will purchase large quantities of apples, black-eyed peas, cherries, citrus, cranberries, onions, melons, peaches, and potatoes, as specified in The Agricultural Risk protection Act of 2000 (Public Law 106-224).

AMS has also identified figs, plums, dried plums, apricots, pears, beans, corn, tomatoes, sweet potatoes, certain mixed vegetables, and certain tree nuts as also meeting the criteria specified in the act.

President Clinton signed the legislation on June 20, earmarking the funds for USDA to purchase commodities that experienced severely low prices during the 1998 or 1999 crop years (USDA based its selection on a comparison of prices over

the previous five years). The purchases are in addition to USDA's normal annual purchases of fruit and vegetable products.

"Many of our nation's farmers have faced severe economic burdens as a result of superior weather and advances in agricultural efficiency that have combined to produce record yields and low prices," said Michael Dunn, under secretary for marketing and regulatory programs. "USDA can relieve much of the strain by buying commodities and redistributing them through our federal feeding programs, including the National School Lunch Program."

AMS will make the purchases that are authorized in the act over two periods. The first half of fiscal year 2001, October 2000-March 2001, reflects those products that will soon be harvested or already exist in abundant inventories. The remaining commodities will be purchased in the second half of the year to coincide with the harvest period.

from The Vegetable Growers News

PRODUCERS KILL PORK CHECKOFF

U.S. pork producers voted to end the mandatory promotion and research assessment by a 1,500-vote margin.

U.S. Secretary of Agriculture Dan Glickman announced the checkoff referendum results in January. The final tally showed 15,951 votes against continuing the checkoff; 14,396 votes in support of the checkoff. The voting was held August 18-September 21.

"A program that imposes mandatory assessments on pork producers and importers must have the demonstrable support of its participants," Glickman said. "The pork checkoff program does not have that support."

The referendum process has been a bumpy one and the National Pork Producers Council claims USDA did not have authority to hold the vote because it did not validate sufficient signatures on referendum petitions. The council filed an injunction to overturn the decision, calling the USDA's

decision "politically motivated."

"Instead of a sincere attempt to capture the will of the majority of legitimate pork producers about their checkoff, USDA let political motivation decide the fate of one of the most successful commodity programs in American agriculture," said Craig Jarolimek, NPPC president.

Approximately \$54 million was collected through the pork checkoff in 2000, based on the assessment of .45 of 1 percent, or 45 cents for every \$100, of a pig's value when it is sold.

The advertising campaign that developed "The Other White Meat" identification was funded through checkoff money.

Twenty percent is returned to state pork association for state-directed promotion, education and research programs. Last year, for example, the Ohio Pork Producers Council received approximately \$300,000 for state programs.

from Farm and Dairy

SHEEP INDUSTRY AWAITS FURTHER WORD ON CHECKOFF

The American sheep industry is still waiting for USDA to publish a formal proposed order in the *Federal Register*.

The effort for a national marketing assessment program, or checkoff, moved forward in May 1999 when the USDA conducted an industry-wide meeting to determine interest in such a program.

At that meeting, the USDA created the industry-wide USDA Sheep Industry Checkoff Exploration Team, which met throughout the Summer to discuss a

lamb-only proposal.

The team finished its work with distribution of a draft "Lamb Promotion, Research and Information Order" proposal in September 1999.

The USDA issued a request for lamb checkoff proposals November 22, 1999. The deadline to respond was February 1, 2000.

The U.S. sheep industry has been waiting for a formal order to be published for public comment since that time.

from Farm and Dairy



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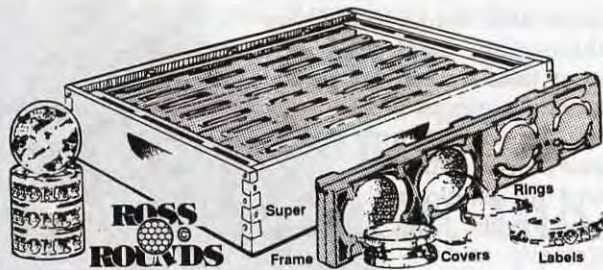
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When not in traditional boxes and being tended by white-clad beekeepers, honey bees tend to get an unusual amount of attention. By nature, honey bees lean toward the exotic for most people. Fear, curiosity and respect are common reactions whether seen live or on television, in the movies, in observation hives at fairs, or in photos in the press. But throughout history those with perhaps a bit more insight than most have adopted the image and reputation of the industrious honey bee to reflect their own desires and goals and the image they want to promote to others.

Napoleon was one who borrowed the honey bee image to adorn many of his official and personal artifacts – drapes, upholstery, clothes, wall hangings – and to impress others with his industriousness and royal image.

Napoleon died in exile on St. Helena Island, and during the autopsy some small part of the Little Corporal was removed and saved. It is thought that this act may have been inspired by the acts of ancient Christians who saved bits of bones and flesh of saints and kept them in sometimes plain, sometimes festive, but always holy containers. These reliquaries were (and still are) symbols of the power of the donor. The reason for keeping part of Napoleon may have been the same, or not, but it still remains, so to speak, in this box.

Napoleon's reliquary is a 4" x 5" leather coffer, with the Emperor's Emblem (small symbolic bees adorn the crown) on top, wherein resides a part of Bonaparte.

Enter *Nest* magazine, an upscale New York interior and interior-design magazine, focusing on the home and where (New York) people spend their time. It is a quarterly, oversized, glossy, very well done but somewhat expensive addition to the field of

design magazines. James Spagnoletti, assistant editor, put together a story on the Napoleon reliquary after he learned of the item, the many people who had owned it over its 180-year history, and the fact that nobody is quite sure how or why it came to be. A photo of Napoleon's "Final Nest," protected by bees, would fit the editorial mission, he thought, so he contacted photographer James Wojcik to make it happen.

They built a Plexiglas box to hold the shoot in, and found Ellen Zambino, a beekeeper and occasional bee wrangler from Greenwich, Connecticut, to help set it up. She brought a package with caged queen to the New York offices, and the fun began.

Getting bees out of the cage and away from the queen proved to be a challenge, but making some lighting changes and offering daubs of honey around the reliquary made it work. The Plexiglas box was leaky, however, and the crew was subjected to some stings, but other escaping bees were quickly let outside.

The shoot (published in *Nest's* Winter issue) took about four and a half hours to complete. The camera used was an ACRA Swiss, 8" x 10" format. Photographer Wojcik has worked for IBM, Diet Coke and *Vogue* shoots, and does still life and other commercial and editorial work.

You can find out more about *Nest* at www.nestmagazine.com, and Ellen, a sideline beekeeper with a couple dozen hives works for a Web-based bee supply company, www.beecommerce.com.

We appreciate the contributions of Mr. Wojcik, *Nest* magazine and Ellen Zambino in helping us produce this article. All photos are copyright *Nest*. Any speculations about the contents of the box are strictly your own.



A Small Part Of Bonaparte

Photographer
Wojcik

Editor
Spagnoletti

Wrangler
Zambino