Bee Culture

MAY 1995

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COLUMNS

DEPARTMENTS

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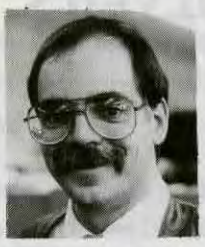
Publisher



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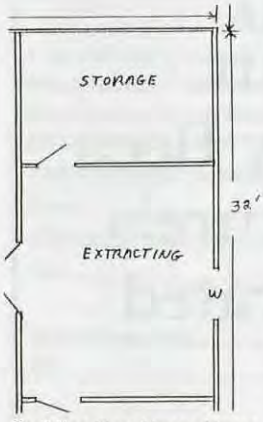
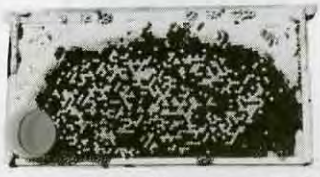
Mite Resistance, Pg. 268



Building Your Honey House, Pg. 277

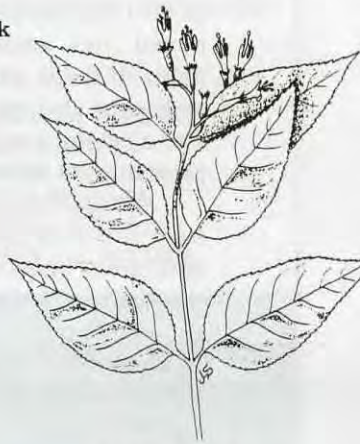


Spring Management, Pg. 282

FEATURES

Cover
Real Geraniums, not those hot house things you buy at the nursery each spring (Pelagoniums, actually, *not* geraniums), bloom this month in the north, and are very, very attractive – both to bees, and to the people who raise them. The delicate purple blossoms last only a few days, but the plant blooms for several weeks if the spring weather doesn't get too warm. Though not a major nectar or pollen source, they do attract bees to your perennial garden.

photo by Kim Flottum



Abelias, Pg. 297

INNER COVER

African Honey Bees & Nature's Integrated Pest Management Program

I had a long talk with Paul Jackson recently. Paul is the State Apiary Inspector for Texas, and is in the forefront of what's happening in his state relative to the African Honey Bee (AHB). Lots is happening now. It's swarm season. By mid-April Paul had added six new names to his growing list of quarantined counties, and he suspected there would be more as the season progressed.

"They're all headed west, though", he said, "not north, and not east"

This move-west-only phenomena has puzzled scientists for quite awhile. After all, the predictions, based on pretty good science, said that once the bees entered Texas, they would move east, along the coast, faster than west, into New Mexico and points further.

After several years of observations some reasons for this have surfaced. Without hard data, though, many are hesitant to say "for sure" but I think Paul's ideas are pretty sound.

First off, some of the AHB swarms captured have been found with *Varroa*, especially in those bees heading east. This makes sense if you think about it. The eastern part of Texas has by far the highest number of beekeepers. More beekeepers means more bees means more *Varroa*. The probability of these feral AHBs contacting *Varroa* increases dramatically as the number of European bees they contact increases.

Right along with *Varroa* is American foulbrood. It's the same as with *Varroa* - more contact means more disease means slower movement.

As these bees try to move east they encounter several other obstacles besides the dilution effect of thousands of beekeepers' bees, and their *Varroa* and AFB contamination.

The eastern part of Texas also has a significant agricultural industry. Certainly more than the desolate and desert-like western portion of the state. With agriculture comes pesticides. Chemicals distributed without thought to where wild colonies may be (even managed colonies have their problems), will take their toll.

Then, to this add a tiny, but merciless little beast called the fire ant. African honey bees tend to nest in less-than-perfect (by European bee standards) locations - inside abandoned tires, small ground cavities, barrels and the like. Many of these are close to the ground, and fire ants have access to any and everything close to the ground. They find a colony and go for the brood - like bears, they like the protein. And African bees produce lots and lots of brood.

Add all of these together- *Varroa*, AFB, European dilution, fire ants and pesticides, and it's no wonder those bees aren't moving east. If fact, given the odds, I'd move west as fast as possible.

But then, California has lots of bees, beekeepers, pesticides, AFB, *Varroa* and tracheal mites, too. And if all that doesn't stop them, there's that new Governor...

When added together, this sounds sort of like the IPM (Integrated Pest Management) programs some beekeepers are using to combat some of their other problems. They use chemicals for treatment, some management tricks to avoid and reduce infestations and the like.

I guess all these road blocks in the AHBs way is *Nature*'s IPM program. Keep up the good work!

Kim Flottum

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Definitions Of Honey

The National Honey Board reminds the industry that the document "Definitions of Honey and Honey Product" is open for comment, review and improvement. A copy of the document is available from the National Honey Board (303-776-2337). All comments received to date have been recorded and will be considered for action. Additional comments can be sent to Dr. Jill Snowdon, NHB, 390 Lashley Street, Longmont, CO 80501. Please submit comments by July 1, 1995.

Dr. Jill Snowdon
Longmont, CO

Footnote to Langstroth

To neglect footnotes is a chancy business. A historic example is the postscript I.F. Shmalhausen added to his 1874 thesis after he had handed the manuscript to the printer, and later discovered Gregor Mendel's article on genetics. When the thesis was translated from Russian by a German publisher, the footnote was omitted. This first, and apparently only evidence, that anyone else understood Mendel's work before 1900 was lost until some nit picker insisted on a routine comparison of the reprint with the original.

I recently requested the Patent Office to provide the second sheet of drawings they omitted from Langstroth's Patent No. 9,300. Instead what I received in January was a *second* Langstroth patent No. 1,484 for an "Improvement in Beehives." Both patents have the same statement: "Specification forming part of Letters Patent No. 9,300, dated October 5, 1852; Reissued May 26, 1863, No. 1,484." The earlier patent was not printed until 1912, and I assumed "reissued" meant the "extension" of the patent mentioned in Langstroth letters. Wrong! The only reference I found to it is the footnote (p.99) in F. Naile's *The Life of Langstroth* (1942), explaining it was requested "to enable the patentee to amplify and clarify his original application so that in the event of litigation, which was then impending, all the pertinent information would be on record."

The text of the reissue is half the length of the original, and the claim for double glass walls is omitted. The conspicuous additions are references to earlier hives; four to F. Huber (1792) (dates not in patent), seven to M. Debeauvoy (1847), and five to Wm. A. Munn (1851). Langstroth judged his hive superior to these earlier ones: "What I regard as a very serious defect in all hives constructed on the Huber, Munn, and Debeauvoy principles is, that they make no provision for the removal of the spare honey, except by opening the main hive and taking out the frames on which the bees have stored it, thus giving no facilities for timid or inexperienced persons to secure the surplus honey, or to any persons to secure it in convenient and attractive receptacles in which it can be safely carried to market in the comb."

The patent also referred to pages 86, 87 and 94 in Beven (1838) that included an illustration of R. Golding's hive having a center-board with openings "to admit of being supered with three small glasses or one large," and a straw-hive with bars on which glasses were placed. Although prior to his, Langstroth contended it was the shallow air-chamber or air-space above frames or bars that was the unique feature in his hive essential for successful use of honey-receptacles.

In later years Langstroth regretted the "bitter epithets and invectives he used in the acrimonious controversy" in the bee journals. He advised against patenting devices easy to make, as there is no protection except legal proceedings and few have the means to do so. The analysis that Langstroth did for A.I. Root of a patented sectional honey-frame could be applied to his own patent: "The application of an *old* thing to a *new* use, without any other invention, is not a patentable contrivance" (*GBC* 1883 pp 614-615). The bee space he added between the frame, hive wall, and lid was, after all, the old principle used in ancient Greek hives between bars. In Patent No. 1,484 Langstroth acknowledged the prior use of movable frames. In an April 23, 1860 letter to George Neighbor, the English appliance dealer, Langstroth offered to include "improvements" for an English patent of his hive for a "very moderate compensation."

Toge S.K. Johansson
East Berne, NY

Simple Skunk Solution

I found your March 1995 article, "Skunks" amusing. Many things the authors wrote are correct. However, the author's solution was costly and complicated.

I'm a hobbyist beekeeper. I once had a problem almost exactly like the one described in the article. One of the old-timers in my club had a cheap, low-tech solution to the problem. "Raise the hives."

He showed me how to make a hive stand. The stand is a small table without a top. Its legs raise the hive about 18" off the ground. The hive's bottom board sits on a rectangular frame nailed flush with the top of the stand's legs. I imagine any sturdy platform would work just as well. The parts list and instructions are:

4 2"x4"18" (legs)
2 1"x4"x24" (long frame sides)
2 1"x4"x16" (short frame sides)
2 1"x4"x16" (front & back leg braces)

Nail together frame sides into a box, with the legs on the inside corners. Tops of the legs are flush with top of frame. Nail the braces to the legs about 6" from the top of

Continued on Next Page

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the legs. Price of materials (new): $7

Once I put my hives on the stands, the skunk problem went away. The old-timer believed the stand works for two reasons: 1) only the biggest skunk can stand up 18" to reach the hive entrance, 2) a standing skunk exposes its tender underbelly to bee attack.

The point is, a few scraps of lumber and a little common sense can do the same job as an expensive, solar-powered, electric fence. I think feeding a dog meaty, canned food and letting him do his business around the outside of the beeyard might be easier and still less expensive.

By the way, the hive stand also saves on having to bend far over while tending your hives.

J.P. Schroeder
Merrimack, NH

Extended Flow Solution

In Steve Taber's article on managing an Extended Honey Flow in the March issue of *Bee Culture*, it seems to me that the procedures he described were extremely labor intensive.

I've had to deal with honey flows that start in early May and last through much of August and I've got a suggestion for Steve that worked for me and is a great deal easier.

In mid-May, after my swarm control procedures are complete, I stack five empty medium supers on the hive above an excluder. (Shallows or deeps would work equally well, but the number of each would differ). In late June the top two chambers, (sometimes the top three) are usually full and mostly sealed. These chambers come off, go to the extractor, and are replaced with empties which are placed directly above the excluder and below the partially filled supers. Two or three weeks later, depending on the honey flow, more supers come off and are replaced. When the honey flow appears to be ending, I take off full supers but do not replace them with empties. This usually leaves three supers on the hive which stay there until September.

Sydney B. Self, Jr.
Bedford, VA

AHB & The Law

Your March 1995 issue was excellent. I believe the best yet for which I would pay more for.

I think Dr. Mike Allsapp's letter was more realistic than Prof. Winston's article, but I find both of them, "not living in the real world." I think our biggest problem with the AHB will be what the news media is doing with the information and what will occur when the law suits start. I am hopeful that AHB does not reach New York state in any quantity as long as we are over-loaded with attorneys trying to get rich on working persons inability to control everything in the world. If I lived in Texas I would stop beekeeping and cancel my subscription, rather than to contribute to the corruption in our legal profession.

I would like to hear some of your writers views on this in the Mailbox. Are the law suits in Brazil and Central America as prevalent and costly as the U.S.?

Gerald Austin

Advice?

I don't read some of your articles because I have been acquainted with bees for 48 years and I am labeled as "the Maverick Beekeeper."

But over the years *Bee Culture* has been a very good supplement to my beekeeping course at the University of NE, College of Agr. It kept me up with the things that are new.

When I get a new issue I want to sit down and read it all but not for long because my wife reminds me I've got work to do and can read it at night.

At 72 I am wanting to cut down to a 100 hives or fewer and get a pontoon boat and do some fishing.

My biggest problems come from the fact that my bees are illiterate because if they weren't they would do what they are supposed to do from what I read. The other problem comes from the fact that they are female and have a mind of their own and they don't have to follow the rules. My wife doesn't appreciate or agree with last comment.

James Hagemeyer
Madisonville, TN 37354

Looking For A Program

Although it is just a bit early yet, signs indicate that 1994 has been a worthwhile effort and success for my beekeeping. The colonies have so far this year shown to be healthy. I left on very hefty honey stores and medicated properly. I also plan to expand this year.

I now plan to invest in a computer and have questions regarding which software to purchase. There are so many programs to chose from. I wish to have a program for use in managing my business, i.e.: keeping track of management practices, inventory, cost analysis and so forth. Is there such a program developed for beekeeping or are we talking about using a common type program and programming it to meet specific needs. Any advice or recommendation you could make would be appreciated.

Tom Bertrand
New York

Editor's Note: There are no programs available specifically for a beekeeping business that I know of. Although there have been several attempts in recent years. The cost of development relative to the very few who could use one make this prohibitive. You will probably need to develop your own, using a simple data base management program that includes spreadsheet capability.

Honey Bee As National Insect

I would like to take this opportunity to update you on my efforts to win designation of the honey bee as our National Insect. You may have heard that there was some concern that commemorative legislation would be banned in the 104th Congress. And this in fact happened on Opening Day, when the new House Rules were adopted, stating: "No bill, resolution or amendment could be introduced or considered in the House that establishes or expresses any commemoration (defined as any

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remembrance, celebration or recognition for any purpose) for a specified time."

This new rule will save taxpayers roughly $300,000 per year. But I also see good news in this development for us. Under the new House rules, the Committee on Government Reform and Oversight will set up alternative means of establishing commemorations – probably by establishing a special independent commission, which will make recommendations to the House of Representatives. Under these new rules, we may finally be able to get consideration of our legislation onto the floor of the House.

I have written to Congressman Bill Clinger, 2160 Rayburn Office Bldg., Washington, DC, 20515, the Chairman of the House Committee on Government Reform and Oversight, to ask for his support for making the honey bee the National Insect and to see when a commission will be established to consider our request and other commemoratives. In the future, I may ask for your help in lobbying the Commission, Chairman Clinger, and others as we work towards our goal.

Thank you for asking for my assistance in making the honey bee the National Insect. I will keep you updated on developments here in Washington, and look forward to working with you in the weeks and months ahead.

Richard Burr
Member of Congress
5th District, NC

Pollen Collection – When & Why

So long as writers contend that bees adjust their pollen collection to the hive needs, I'll continue to try to rebut them. The latest example is Dr. Mark Winston in the March, 95 issue (p. 143).

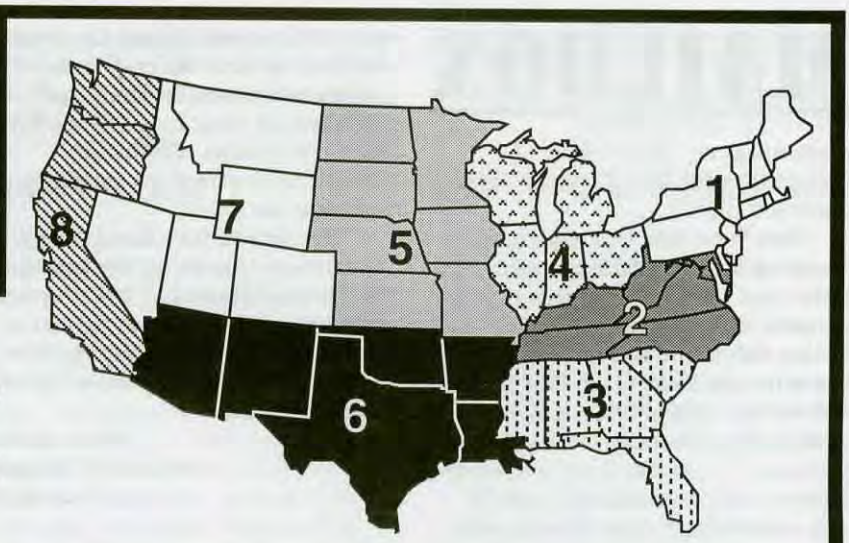
On two separate occasions I have returned to a hive in early spring to find the bees hurriedly collecting pollen in large numbers only to discover that the hive is queenless and broodless. My bees in this suburb of Seattle drive me crazy with their excessive pollen collection. Over and above the hive's pollen consumption, I wind up cutting out combs of pollen and replacing them with foundation just to get the surplus out of the hive.

I have an entirely different notion from Dr. Winston's. If bees could adjust foraging to hive needs, would they store a hundred pounds more honey than they have any need for? What about the pollen summer and late winter's brood needs, pollen available only from flowers in the spring in many places? Bees can't dope all this out by responding to the needs of the moment. I speculate that they forage "their" territory and bring in all the nectar and pollen they find, provided only that they have a taste for the particular sources.

Dan Hendricks
Mercer Island, WA

MAY Honey Report

MAY 1, 1995



REPORT FEATURES

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

	Reporting Regions								Summary		History	
	1	2	3	4	5	6	7	8			Last	Last
Extracted honey sold bulk to Packers or Processors									Range	Avg.	Month	Yr.
Wholesale Bulk												
60# Light	46.40	42.50	42.92	40.67	31.20	40.00	42.00	39.30	31.20-56.00	41.55	41.49	42.78
60# Amber	38.29	43.00	33.00	40.25	40.30	37.08	40.00	36.50	27.00-52.00	39.93	39.97	43.59
55 gal. Light	0.55	0.52	0.53	0.57	0.56	0.54	0.55	0.53	0.47-0.90	0.56	0.57	0.59
55 gal. Amber	0.51	0.53	0.58	0.55	0.54	0.48	0.50	0.49	0.43-0.78	0.53	0.53	0.58
Wholesale - Case Lots												
1/2# 24's	21.21	26.09	16.80	18.74	18.63	20.37	22.85	21.13	15.60-38.40	21.69	20.14	19.79
1# 24's	30.26	32.04	28.10	33.01	30.98	31.68	31.25	30.43	24.00-38.00	31.32	30.10	29.73
2# 12's	27.43	29.60	27.30	30.97	23.57	26.97	30.25	30.50	16.80-36.00	28.71	28.25	28.85
12 oz. Plas. 24's	25.37	28.77	25.63	26.62	17.53	25.75	27.50	25.07	25.00-37.90	26.49	26.95	28.45
5# 6's	28.30	28.50	31.80	32.62	26.59	27.63	29.20	29.53	18.00-36.00	29.77	30.16	29.97
Retail Honey Prices												
1/2#	1.39	1.97	1.30	0.98	1.15	1.30	1.18	1.21	0.89-3.50	1.38	1.33	2.71
12 oz. Plastic	1.57	1.58	2.25	1.49	1.39	1.62	1.70	1.49	0.99-2.50	1.62	1.60	1.61
1 lb. Glass	1.81	1.98	1.90	1.69	1.82	2.19	1.90	1.63	1.39-2.59	1.86	1.79	1.78
2 lb. Glass	3.08	3.29	3.13	2.96	3.19	3.09	3.15	2.39	2.39-4.00	3.19	3.08	3.21
3 lb. Glass	4.24	4.87	4.50	5.70	3.85	4.17	4.50	4.37	3.50-5.70	4.46	4.45	4.25
4 lb. Glass	5.40	5.40	5.50	6.43	6.43	4.92	5.25	5.49	4.69-8.95	5.66	5.54	5.76
5 lb. Glass	6.50	7.10	6.25	7.04	6.75	6.16	6.35	6.25	5.97-8.95	6.73	6.62	6.41
1# Cream	2.41	3.04	2.73	1.69	1.96	2.98	2.15	1.89	1.69-4.00	2.50	2.19	2.13
1# Comb	3.04	3.07	2.75	3.25	2.96	3.45	3.75	3.50	2.25-4.00	3.20	3.24	3.19
Round Plastic	2.82	2.75	3.00	2.95	3.00	3.54	3.00	2.96	2.00-4.00	3.01	3.04	2.74
Wax (Light)	1.75	1.35	1.75	1.60	2.09	1.66	1.45	1.48	1.25-4.00	1.75	1.66	1.78
Wax (Dark)	1.37	1.19	1.43	1.50	1.60	1.07	1.30	1.33	1.00-2.75	1.39	1.35	1.36
Poll. Fee/Col.	27.79	27.50	30.00	32.50	30.00	14.83	35.00	28.33	10.00-55.00	28.94	30.86	30.42

MARKET SHARE

The price of honey is going up. Not everywhere, at least not yet, but prices are climbing. And just in time. Glass, plastic, wood, paper and fuel prices are all rising faster than inflation, and will seriously change how honey is priced.

If you're selling out the back door or at work, don't overlook these price increases to you, and, hence, to your customers. Remember your labor costs, too. You do consider your labor, right?

And certainly don't forget to keep making contacts for summer and fall farm markets. And don't *underprice* the competition – overprice it, and make it worth the market's cost, and shelf space.

Region 1

Prices generally up since last month, although some commodities still lagging. Colony conditions average to a bit better this spring, but *Varroa* still taking its toll. However, colonies properly treated seem fine, and going strong. Chinese honey tarriff already having an effect, and prices expected to get better as domestic supplies dwindle.

Region 2

Some prices way up this month, primarily retail and small bulk containers. Barrel prices steady to down a bit, but this reported in early April. They will be going up. Mite problems reduced this year, but untreated colonies still dying.

Region 3

Prices not rising very fast, if at all here. Speciality crops (citrus did moderately well and should command higher prices) will do better, later. Early build-up due to strong colonies and mild winter, but mites *still* causing problems. Lots of non-regional honey showing at retail at low prices.

Region 4

Prices steady to gradually increasing across all products, but still slow. Much stored honey moving at moderately higher prices, with promises for even higher prices later. Colonies generally in good shape, strong, and, if treated low to no mite problems. Slow spring.

Region 5

Bulk prices up dramatically since tarriff on (but they were pretty low to start with), but retail steady. Colonies still under strong *Varroa* pressure. Treated, (but late) colonies gone, and losses reaching 100%. Tracheal pressure lower, especially if menthol and grease treated.

Region 6

Prices not increasing dramatically, as of early April anyway, but producers see increases, dramatic increases soon. Retail still weak. *Varroa* and tracheal seem to have already taught producers it's treat or die, and most are now treating successfully.

Region 7

Prices virtually unchanged, but that's only short term. Some futures contacts show hefty increases, so hope is on the way. Retail sales, and demand still strong though, which is good. Mites spotty, but still around. Treat or die.

Region 8

Prices inching upward, and with good crop, should do well by harvest. Demand spotty though, but should straighten out by mid-summer. Lots and lots and lots of mite problems. PMS, *Varroa,* tracheal . . treat, treat, or die.

1994 Honey Price Summary

Honey Exports 1993 - 1994
1994 Exports Flat in Lbs., Price Down 6.6%

Country	Amt. - '93	Amt. - '94
Martinque	17,140.2	16,427.2
Brazil	19,492.0	0
Argentina	15,881.8	0
Sweden	630,599.2	10,587.4
UK	66,541.2	91,949.0
Netherlands	390,508.8	16,060.0
France	143,050.6	66,270.6
Germany	692,388.4	1,000,006.8
Lebanon	12,298.0	75,220.2
Kuwait	465,682.8	27,0102.9
Saudi Arab	1,242,399.4	329,624.6
Qatar	37,721.2	45,705.0
Arab Emirates	358,650.6	387,642.2
S. Yemen	1,15,292.2	775,913.6
Oman	82,244.8	0
Singapore	85,056.4	99,904.2
Indonesia	91,715.8	40,112.6
Brunei	5,134.8	0
Philipines	59,734.4	0
Hong Kong	387,316.6	338,867.2
China	87,777.8	253,723.8
Japan	501,963.0	855,817.6
Canada	864,776.0	904,739.0
Mexico	292,208.4	253,253.0
Guatemala	30,467.8	0
Costa Rica	36,042.6	0
Panama	8,511.8	16,728.8
Barbados	19,322.6	16,676.0
Northern Antilles	4,400.0	3,300.0
Guadalupe	39,384.4	45,056.0
Poland	5,500.0	0
Israel	26,628.8	0
Jordan	11,985.6	0
Thailand	2,395.8	3,592.6
Malaysia	13,413.4	7,196.2
China Main	104,222.8	306,114.6
Korean Republic	6,545.0	121,200.2
Belgium	0	35,090.0
Aruba	0	7,724.2
Columbia	0	2,723.6
Russia	0	6,776.0
Bahrain	0	33,110.0
Pakistan	0	29,937.6
New Caledonia	0	1,271.6
New Guinea	0	7,365.6
Ecuador	0	5,869.6
Peru	0	8,804.4
Chile	0	5,869.6
Sweden	0	1,272,994.8
Switzerland	0	98,025.4
Greece	0	5,869.6
Bahamas	0	2,789.6
Barbados	0	3,806.0
Total Exports, Lbs.	8,522,888.0	8,551,714.6
Export Value	$6,118,841.0	$5,729,298.00
Avg. Price/lb.	$.718	$.670
Difference		
Imports vs. Exports	122,720,052.4 lbs. / $43,110,295.00	129,493,181.4 lbs. / $31,481,492.00

Source: USDA, Dept. of Commerce

USDA Price/lb., All Honeys 1989-1994

1989	1990	1991	1992	1993	1994
48.8¢	53.7¢	55.9¢	55.0¢	53.9¢	51.2¢

Source: USDA, NASS

Retail price 1 lb. Jar Honey 1989-1994

1989	1990	1991	1992	1993	1994
$1.55	$1.55	$1.65	$1.73	$1.79	$1.80

Source: *Bee Culture* Monthly Honey Report

U.S. Honey Imports Down 7.8% in Lbs.; 4.7% in Price

Country	1993 Imports, lbs.	1994 Imports, lbs.
Canada	11,233,080.9	9,325,067.4
Argentina	35,875,903.7	40,186,986.4
China, M.	76,105,314.8	64,286,699.4
Australia	2,440,638.2	1,247,096.4
Mexico	4,547,103.0	5,175,849.8
Dom. Republic	362,034.4	212,372.6
Hong Kong	218,195.9	143,550.0
All Others	460,669.5	363,844.8
Totals	131,242,940.4	120,941,466.8
Value	$49,229,163.00	43,210,790.00
Avg. Price	$.3751/lb.	$.3573/lb.

Source: USDA, NASS, U.S. Dept. Commerce

REGIONAL SUMMARY 1989-1993

	Production (x 1000)						Colonies (x 1000)						Avg. Yield/Colony, lbs.						Avg. Price/lb.					
Reg.	1989	1990	1991	1992	1993	1994	'89	'90	'91	'92	'93	'94	'89	'90	'91	'92	'93	'94	'89	'90	'91	'92	'93	'94
1	8832	7091	7911	6734	6734	7192	195	182	147	129	123	122	45	39	54	52	45	53	.62	.71	.67	.69	.91	.71
2	3945	3567	3078	2993	2987	3057	127	101	88	68	66	62	31	35	35	44	46	49	.74	.87	.76	.79	.95	.95
3	20029	29532	25190	30964	29962	27267	446	396	389	366	327	357	45	75	65	85	73	70	.50	.51	.56	.56	.59	.57
4	18274	20496	20105	16122	18952	16535	320	299	305	274	252	218	57	69	66	59	68	71	.59	.60	.59	.61	.67	.72
5	59846	64335	76256	74119	70143	82268	641	879	919	946	835	836	64	73	83	78	75	80	.46	.51	.54	.54	.50	.55
6	18134	22015	23353	23837	22091	18881	319	325	331	312	281	259	57	68	71	76	75	71	.51	.55	.55	.53	.60	.55
7	21965	22063	22774	26780	26662	29875	393	397	319	315	363	394	56	56	71	85	67	70	.49	.55	.58	.58	.63	.60
8	24717	27122	38906	37558	51251	30970	693	621	661	602	613	510	36	44	59	62	67	62	.49	.53	.54	.55	.56	.52
Tot	175742	196221	217573	219107	228782	216045	3434	3200	3159	3012	2860	2758	48.9	57.4	63.0	67.6	64.5	65.8	.55	.60	.60	.61	.68	.65
Increase/ Decrease		+12%	+11%	+1%	+4%	-6%		-7%	-1%	-5%	-5%	-4%		+15%	+9%	+7%	-5%	+2%		+9%	0%	+2%	+10%	-4%

Source: USDA, ITC

NEW BOOKS

Animal Close-Ups. THE BEE - by Paul Starosta. Charlesbridge Publishing, 85 Main St., Watertown, MA, 02172. $8.95 postpaid. 28 pgs. 43 photos. Soft cover.

This is perhaps the most beautifully photographed and well written book on bees and beekeeping for children I have ever seen. The photography is absolutely stunning, showing every aspect of bee biology in color, up close, and well documented.

The story that goes will all these pictures explains foraging, the dance, honey, wax, the queen, swarming, wintering, beekeeping, pollination and even stings. And, it has a bit about other kinds of bees. It is written in an easy to understand, and easy to read format, enjoyable for youngsters, certainly, but even adults.

I would use this book with kids, neighbors who don't quite understand bees, a gift to a special young relative or even for yard rental.

It is, without question, an A+ publication.

• Animal Close-Ups •
THE BEE

Soap Recipes. By Elaine C. White. Valley Hills Press, 1864 Ridgeland Rd., Starkville, MS 39749. 224 pgs. Soft Cover. $23.95

This wonderfully written book is an easy to use guide to make all kinds of soap, especially hand and bath soaps. Similar to her other book, *Super Formulas*, this is a must buy for people interested in creating unique and personal soaps on a small scale.

Ms. White explains carefully the materials and equipment you need to start, from essential ingredients, (fat, lye, water) to stainless steel mixing bowls and glass heat-proof containers. One short-coming I found was in explaining how to weigh the oils used in some of the formulas. All oils were in ounces (not fluid ounces) but she didn't explain how to tare the weights. It would be helpful to have dixie cups or other light weight container for weighing the oils. There is, however, some excellent additions at the end, including a troubleshooting section, starting a business, a Q&A section, a dozen or so appendices including an extensive supplies list, a great bibliography and a long, long glossary.

The book is easy and fast to read with helpful hints and tips. Since there is no other book of its type (that I could easily find in the local library), it is worth the money if you want to use honey and beeswax when making soap for personal use, or to sell. Although I didn't make any of the recipies from this book, (I have, on other occasions, tried Elaine's suggestions), there is no doubt even I could make soap using this book. You can too.

If your water supply is hard, use rain water or distilled water to make and use soap.

NEW VIDEO

Beginning Beekeeping Video. 2 Hr. Produced by Dr. Richard Iacobucci, Pembroke, MA 02359. $35.00

Yet another beginner's video has been released, this one by Dr. Richard Iacobucci, from Pembroke, MA.

A beginner's video doesn't need to be Public TV quality to do the job of showing somebody how to put together equipment, install a package or check a colony during the season.

What it does need, though, is to be correct in what it teaches, even if the camera work is a bit shaky.

This video has several problems, and I would be reluctant to recommend it to someone who does not yet keep bees. And that's too bad, because it has some good people helping out, and tackles most of the problems a beginner will encounter.

One can quibble about the equipment section, but Rick Bennett does a good job explaining what and why he does for the frames, tops and supers. He doesn't use glue, however, for any of the pieces.

The package installation was unrehearsed, which was unfortunate, because that's a critical element for beginners. Although the installation did progress, much opportunity was lost to explain the events and other techniques.

The small-scale extraction technique demonstrated was unique, (heating comb and honey in a double boiler and pouring off the honey), but works. You don't reuse the pans, though, which wasn't mentioned.

The remainder, biology and diseases, was covered using photos only, and some were upside down!

As a first try, this video isn't bad, and a novice will get some information. Unfortunately, some of it is either incorrect, or inconvenient.

Compared to other videos on the market (Ed Weiss, Keith Deleplane) this one doesn't measure up.

MITE RESISTANCE

More Views On A Tricky Issue

On Tracheal Mites

diana sammataro & glen needham

Mite-resistant honey bees. Do they really exist? And, what is resistance? By definition, resistance exists, "if the host's physiological status prevents the establishment and survival of the parasite." This process is not a simple one because it involves developing several mechanisms for resistance and having them succeed over time.

Resistance mechanisms involved for any host-parasite interaction are divided into three types. Classic examples are best illustrated using plants and insects. One resistant mechanism is called non-preference, or *anitxenosis* - literally, against the stranger - which means that the pest 'prefers' not to feed or lay eggs on a particular host when it has a choice between different plants of the same kind. One of the plants may not taste good because of certain chemicals it produces, or it could posses a physical barrier (e.g. hairy stems or leaves) to discourage feeding or egg laying behavior. The insect will choose the other one.

Antibiosis (against life, e.g. antibiotic) means the host has a physical or chemical attribute that kills the parasite. An example of this is nicotine (from tobacco plants) and pyrethrum (from the daisy family); they are naturally-produced chemicals that kill some potential parasites.

Tolerance of a parasite allows the host plant to accommodate the pest, yet continue to live and to produce a crop of seeds or fruits (to reproduce). This latter form of resistance places no selection pressure on the host (all the plants survive vs. only the strongest survive). Therefore it is unlikely that resistance to tolerance will occur.

So when you read claims about mite-resistant bees, the first question you should ask is: "What types of resistance do your bees have"? Some forms of resistance are genetically recessive traits, which means that they cannot be sustained except by careful manipulation and, for bees, this usually means instrumental insemination. The tolerant form does not need such careful attention.

Another question is the level of resistance. Resistance should be quantified and compared to a control. If a particular strain of bees is 30% mite-infested compared to 80% in the control, is that strain resistant? What about 20% compared to 40%, or 10% and 12%? Without such comparisons, the term resistance is meaningless. A tolerant bee strain with 80% infestation may still give you a good crop of honey and be able to live year after year whereas a bee strain exhibiting the antixenosis mechanism may need to be pampered every generation.

Viewed from an acarological perspective the first obvious question is: Against which mites are these bees resistant? The tracheal mite and the *Varroa* mite are both problems. The former is an endoparasite (one that lives inside its host) and evolved in European honey bees. The other is an ectoparasite (lives outside its host) that evolved on tropical Asian honey bees. It is unlikely that any one strain of bees is resistant to both mites. Should we select for resistance to one parasite, it could be at the expense of resistance to the other – or other traits might be lost - gentleness, honey production, winter survival to name a few.

Let's look at just one, the tracheal mite, to illustrate the complexity of bee resistance to mites. Few researchers or bee breeders are investigating the origin and distribution of tracheal mites. These facts may not seem important, but understanding the origin of the tracheal mite's introduction and their genetic variability to inflict damage would help us make better management decisions. Tracheal mites and bees share a long evolutionary history. Endoparasites are very rare in insects and are highly host-specific. That they infect only *Apis mellifera* and *Apis cerana* bees, points to this. Furthermore, tracheal mites live almost their entire lives inside the trachea of honey bees and are highly inbred - brothers and sisters often mate. It is evolutionary suicide for the tracheal mites to kill their host colony, as many are doing now. For the honey bee-tracheal mite relationship to continue, one or both must change.

What resistant mechanisms might exist for bees? Do some strains of bees have physical characteristics that discourage tracheal mites (antixenosis), or is there a chemical difference that is lethal to the mites (antibiosis)? Past research in our lab has shown that tracheal mites prefer younger bees to older bees, and that strains of bees thought to be "resistant" actually had chemicals on their bodies that made them taste like older bees.

Parasites and their hosts are in a continual arms race, a Brinkmanship type relationship and tracheal mites will always win because they reproduce faster than bees. And because tracheal mites have only two chromosomes (and

bees have 16), these mites can adapt more quickly when there is some selection pressure to become less lethal or damaging over time. Remember, if a strain of "virulent" tracheal mites takes over a particular colony, it can kill all the bees and all the mites. It would "pay" the mites to become less virulent.

However, bees may still develop resistance to mites. But even if such a bee is successfully bred, resistance may not last unless it is the tolerance type. Remember, there is no selection pressure against the parasite in tolerant bees.

Beekeepers are understandably concerned about the fate of their industry, already threatened by pesticides, habitat loss, encroachment of Africanized bees, reduced markets and mites. There are no simple solutions. Both mites will be with us from now on. Don't be deluded into thinking a resistant bee is the only answer. An integrated pest management strategy that uses multiple approaches for mite control to solve the problem is what beekeepers should be practicing. These include resistance, tolerance, treatments and management practices. There is no silver bullet. BC

Diana Sammataro is a graduate student, and Glen Needham a professor in Acarology at The Ohio State University, Columbus.

On *Varroa* Mites

roger morse

Resistance By *Varroa's* Natural Host

Among our diseases of honey bees today, that caused by the Asian mite, *Varroa jacobsoni*, is the greatest threat to American beekeeping. The native host of this mite is *Apis cerana*, the small Indian honey bee that is less than half the size of our bee, but that has a biology and life history that are similar. One of the more important questions, one which was answered by Christine Peng of California, is: How does the native host manage to survive attacks of *Varroa*? The answer, at least in part, is that the *Varroa* are groomed off of the bees, chewed, sometimes have their legs bitten off and are carried outside of the hive and dropped onto the ground where they are consumed by ants and other insects.

Reports On Resistant Bees

In searching the world's literature on honey bees, published over the past five to seven years, I find that there are at least 37 papers** that discuss resistance to *Varroa* mites. Seven of these deal with the Asian *Apis cerana* only, but the rest are concerned with the European and African bees we know so well. Most of these papers come from German researchers, which is logical since *Varroa* mites were first accidentally imported into that country probably in 1966 or perhaps, in 1968, long before they were found in the rest of Europe or the United States. The Germans have had more experience with *Varroa* mites than have beekeepers in any other country in Europe or the Americas. Many of their papers deal with the development time of worker honey bees. The thinking in this regard is that bees that develop more rapidly, especially in the pupal stage, do not allow enough time for the young *Varroa* to develop. Other mechanisms of resistance are considered more important today. In addition to the research papers on *Varroa* resistance in Germany reports come from Austria, Brazil, Israel, Sweden, Tunisia, the United States and Yugoslavia. The report from Sweden concerns bees from Tanzania. I am aware that one more report from another South American country is in the works. Most of these reports state that grooming off, biting and carrying mites outdoors, is the most important component in resistance in both European and African honey bees. However, unpublished data that I have been shown involves other considerations too.

Of all of these reports, I think two are especially important. The first comes from Austria (Ruttner and Hanel 1992), where a commercial beekeeper examined his 700 colonies and found 12 in which *Varroa* populations grew less rapidly. These were Carniolan bees but I do not think that that fact is too important. Thirty to 50 percent of the dead mites had damaged legs as well as cuts on other parts of their bodies. It is reported that worker bees cut the mites' legs with their mandibles. What is important here is the fact that honey bee colonies are not all the same and there is variability among them. The fact is that we can select among colonies for those that are more resistant and use those chosen colonies to start a breeding program.

A second report that I consider significant comes from Brazil (DeJong, unpublished), where no beekeeper treats bees for *Varroa* despite the fact that they are in every colony where one searches for them. The precise data will be published shortly, but when I was in Brazil in 1978, and *Varroa* was first found, the mites were present at the rate of over 50 per 100 bees in some colonies. Today, ten percent or less than that number are found in any colony but still the *Varroa* mites are everywhere. I am told by colleagues in Brazil that the principal form of resistance appears to be grooming and removal of the mites from the hive. More heavily infested colonies produce fewer drones, and the fact that drones from these colonies are not available for mating appears to have strengthened the resistance during the past 20 years or so.

Selecting For *Varroa* Resistance

Our knowledge of honey bee genetics and behavior indicates that one may select for *Varroa* resistance in the same manner that one may select better stock for honey production. In fact, large scale producers with a number of colonies may very well be able to do both at the same time.

If you are treating colonies with Apistan strips, it is still possible to select among colonies for *Varroa* resistance. Most beekeepers treat with Apistan only once a year, though we

Continued on Next Page

MITE RESISTANCE ... Cont. From Pg. 269

are told that in Florida, two treatments a year are routine. The time to search for the more *Varroa* resistant colonies is just before it is time for another Apistan treatment. You must use a standard technique for separating the *Varroa* from the worker bees to measure their numbers, or to measure the degree of brood infestation. A selection program will be most successful if the best honey-producing colonies are selected at the same time. An obvious time to do this is at the end of the major honey flow of the year. This process will not result in selecting colonies that are perfectly resistant to *Varroa*, but it is a step in that direction.

Our knowledge of *Varroa* mite biology indicates that it will take several generations of selecting better bees before strongly *Varroa* resistant bees will be produced. It is also important to emphasize that you do not need to discontinue using Apistan strips to make these selections. Carefully made selections will allow you to take longer periods of time between treatments with strips.

Summary

We have the knowledge to select and grow queens that will head colonies that will be better honey producers and more resistant to disease. You must make accurate weight measurements and *Varroa* mite counts to be successful. However, with care and good judgments we can work our way out of our current disease dilemma.

References:

Calderone, N.W. and M.K. Fondrk, *Selection for high and low colony weight gain in the honey bee using selected queens and random males.* Apidologie 22: 49-60. 1991.

Ruttner, F. and H. Handel, *Active defense against* Varroa *mites in a Carniolan strain of honey bee.* Apidologie 23: 173-187. 1992.

*Taken from a lecture by Roger A. Morse at the first ever New York state beekeeper's meeting held at the Archbold Biological Station, Venus, Florida on Saturday, February 11, 1995.

**This figure was obtained by reviewing Apicultural Abstracts from 1989 to date. This journal is published by the International Bee Research Association, 18 North Road, Cardiff, Wales, CF1 3DY UK.

? DO YOU KNOW ?

Mites, and Mite Control

clarence collison

Even though the honey bee tracheal mite (*Acarapis woodi*) and the varroa mite (*Varroa jacobsoni*) have been serious problems for beekeepers since their discovery in the United States in 1984 and 1987 respectively, we continue to learn of beekeepers who are not familiar with the mites and the devastating impacts they have had on the beekeeping industry.

How familiar are you with the parasitic mites and the approved methods of control? Please take a few minutes and answer the following questions to determine how well you understand these important topics. The first 15 questions are true and false. Place a T in front of the statement if entirely true and F if any part of the statement is incorrect. (Each question is worth 1 point).

1. ___ The Asian honey bee, *Apis cerana*, was the original host of the *Varroa* mite, *Varroa jacobsoni*.
2. ___ Male and female adult varroa mites feed on the hemolymph (blood) of adult, pupal and larval honey bees.
3. ___ Tracheal mites complete their life cycle within sealed cells of worker and drone brood.
4. ___ Both *Varroa* and tracheal mites have a five-stage life cycle.
5. ___ Buckfast honey bees were selected and developed by Brother Adam and are reported to be resistant to *Varroa* mites.
6. ___ *Varroa* mites prefer drone brood over worker brood.
7. ___ Female tracheal mites enter the adult honey bee's respiratory system through the first pair of thoracic spiracles.
8. ___ Apistan Strips are approved by EPA for the control of *Varroa* and tracheal mites.
9. ___ Tracheal and *Varroa* mites reproduce throughout the year in temperate climates.
10. ___ When a colony dies from varroa mites, female mites can survive in the combs and within the hive for up to three months without bees or brood.
11. ___ Both male tracheal and *Varroa* mites have a shorter development period than the female mites.
12. ___ The ether-roll technique is commonly used to check colonies for tracheal mites.
13. ___ The susceptibility of adult worker bees to tracheal mites diminishes rapidly as they age.
14. ___ World-wide the honey bee tracheal mite is considered to be a more serious pest than *Varroa* mites.
15. ___ *Varroa* mites have been found to be vectors of the virus that causes acute bee paralysis.

Multiple Choice Questions (1 point each).

16. ___ Both tracheal and *Varroa* mites have been found on every continent except:
    A. Africa
    B. South America
    C. Australia
    D. Europe
    E. Asia
17. ___ The ARS-Y-C-1 strain of bees (Yugo Bees) that are reported to be resistant to *Varroa*/tracheal mites are of _____ origin.
    A. Carniolan
    B. African
    C. Italian
    D. Caucasian
    E. German
18. ___ The active ingredient found in Apistan strips is:
    A. Formic Acid
    B. Folbex
    C. Fumigillin
    D. Flucythrinate
    E. Fluvalinate
19. ___ Apistan strips should be left on the colony from ___ to ___ days.
    A. 21 to 35
    B. 42 to 56
    C. 28 to 42
    D. 49 to 63
    E. 56 to 70
20. Where are the eggs laid by female tracheal and *Varroa* mites? (2 points)
21. What are two characteristics you would use to distinguish between female and male varroa mites? (2 points)
22. When a mated female varroa mite enters a cell containing a honey bee larva, what are the two sources of food that the mite requires? (2 points)

ANSWERS ON PAGE 301

NO MATTER HOW LONG I LIVE

Things I'll Never See

mark winston

If an award were to be given out for the "Person of the Century," it would have to go to a generic scientist. This has been the century of science and technology, with simply unbelievable progress in the human condition due to advances made by scientific research and the application of technology derived from that research. Just think for a minute about the profound differences in our lives from the lives of people living just a century ago. We routinely drive cars, fly in the air and can travel to the moon, although at some expense. I am a middle-aged person, and yet I have been to very few funerals because modern medicine saves most of my cohorts from dying before their 70s and 80s. This article will be sent to *Bee Culture* magazine via the electronic highway in seconds, where it would have taken days or weeks to get there by mail only 10 years ago. Many of the most time-consuming tasks faced by our ancestors can be disposed of today with only the effort it takes to push a button: the heat comes on without chopping wood, the dishes get washed by a machine while we watch television, even our waste gets whisked away by gently pushing a handle.

I was thinking about this last summer while driving out to one of our apiaries with some of my students. Our conversation was rambling in all sorts of directions, as it tends to do when you spend too much time in the cab of a pickup truck, and eventually we hit on the subject of science and bees. I began to wonder whether there were any limits to what science could do for beekeeping. After all, with all of the astounding inventions of the 20th century, it is hard to imagine an area where science has any limits when given enough time for our human ingenuity to solve any remaining problems with a technological fix. Luckily, I have this little inner voice that distrusts anyone, including myself, who claims he can totally solve a problem by the application of science. That voice went public that day, and out of the blue, I said to my students, "There are three things I'll never see; a queen finder, a better queen than we have today and any major improvements in beekeeping equipment."

The first of these, a way of finding the queen in a hive, would elevate its inventor to the status of a Langstroth in the beekeeping world. Unfortunately, I don't believe there is a way to find, attract or trap the queen except for the old-fashioned, non-technological way: open the hive up, look through it, frame by frame, until you find her, then pick her up with your fingers. Yes, you can make your job easier by restricting the queen to one hive body using queen excluders, and yes, you do develop an intuition about which frames to look on for the queen, but basically no one has invented or ever will invent, a practical, high-tech way to locate the queen.

It certainly won't be for lack of interest or trying. I have seen or heard proposed all sorts of wild devices, some of which show considerable inventiveness and ingenuity. One idea that I invariably get asked about when I speak at beekeeper meetings is the use of synthetic pheromones to attract and trap the resident queen in a colony. This idea sounds intriguing, particularly since worker bees can easily be manipulated with pheromones to go almost anywhere you want. However, the concept of attracting a queen to a within-colony trap has one major flaw in it: queens are not naturally or predictably attracted to pheromones within a colony. The most we can say about queen attraction to pheromones is that a resident queen may recognize the presence of a foreign queen by her odor. Yet, how many times have you seen two queens walk right past each other in a hive and each totally ignore the other's presence? Queens may orient outside the nest to the worker pheromones given off as a swarm cluster forms, but they are not responsive to these odors within the context of a hive. Even should some highly attractive odor be found, it would have to be queen-specific to prevent workers from rapidly filling up any type of trap designed to capture an attracted queen.

Other, more mechanical solutions to queen finding have been proposed or even constructed, but they all suffer from over-design by being too expensive and/or cumbersome to use on any routine basis. For example, one beekeeper once showed me a wheelbarrow modified into a shaker box, so that an entire colony could be shaken through queen excluder material, leaving the queen behind. Of course, it only worked some of the time, took about 10 times as long as going through the hive by hand and disrupted the colony for the rest of the day, but otherwise, it was a great device. Beekeepers also dream

Continued on Next Page

"There are three things I'll never see: A queen finder, a better queen than we have today and any major improvements in beekeeping equipment."

THINGS ... Cont. From Pg. 273

about some magic glue-on label for the queen that could be recognized by a scanner, with her location then pinpointed on a hive matrix projected onto a computer screen. Sure, it probably could be done, but think of the expense involved and the high probability that such high-technology equipment would break down under real-world beekeeping conditions. No, I don't think I'll ever see a queen finder that works better than the human eye coupled with a hunch as to where she might be found.

I also don't think we'll ever see a better queen than those used commercially throughout the world today. This statement is not meant to diminish the importance of good queen selection, breeding and rearing by commercial queen rearers; it will always be important to maintain the quality of queen stock used for beekeeping. However, media reporting about science has left the impression that modern ways in a test tube and produce new super-organisms, mix them up in different ways in a test tube and produce new super-organisms that will solve all of the world's medical, environmental and agricultural problems. We tend to forget that there has been a method of mixing genes that has been happening naturally for a few billion years; it's called sex. Queen breeders and scientists already have influenced our queen stock through controlled open mating or instrumental insemination, and we have made great strides in queen quality over the years by controlling what drone inseminates which queen. However, I question whether we can make much more progress in producing queens that are superior to those we have today.

The limitation here is that a colony is a very complex system, and selecting for one or a few beneficial characteristics may be detrimental to the overall level of colony functioning. Disease resistance is a good example. Have you ever wondered why the hygienic behavior found in bees resistant to American Foulbrood has not become a standard component of commercial queen rearing. Part of the answer is that these hygienic colonies have other characteristics that make them undesirable for beekeeping, such as being overly aggressive and producing relatively little honey. Today's search for tracheal mite and *Varroa*-resistant bees may lead to somewhat resistant colonies, which would be useful, but in the end, will those colonies be any better than the best in contemporary beekeeping? I doubt it. Continued queen selection can produce colonies with shifts in characteristics that might be desirable fro future beekeeping situations, but I would be very surprised if they produce more honey at less cost than queens heading today's colonies. Different? Maybe. Better? I don't think so.

Finally, I don't think we'll ever see another major advance in beekeeping equipment with the significance and impact of the Langstroth hive or radial extracting equipment. Beekeepers certainly will make minor modifications in these and other pieces of equipment that will make them easier to use, but can you imagine some piece of equipment or new hive design that would improve on the basic concepts used in modern beekeeping equipment? The Langstroth hive is so soundly based in duplicating natural colony design that I can't come up with even a highly speculative alternative to that structure. For extracting, can any of you envision a better way of getting honey out of the comb than uncapping it and spinning the frame in one direction or another?

Nevertheless, the best part of this pickup truck conversation with my students was that they disagreed with me. Although they couldn't come up with any specific ideas that would find queens, produce better queens or result in a new equipment design, they argued vociferously that major advances in these areas were still possible. After all, they said, someone with my attitudes a century ago would have denied the possibility of computers, pickup trucks, antibiotics and migratory beekeeping, yet all of these things are found in today's beekeeping world. I wish I could be around at the end of the next century as some beekeeping historian is writing one of those "Beekeeping a hundred years ago" columns. I hope this historian finds these predictions of mine about things I'll never see and writes a humorous column in *Bee Culture* about just how wrong I was. It would greatly please whatever is left of my bones if these things I said I'll never see become routine management tools for future generations of beekeepers. BC

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

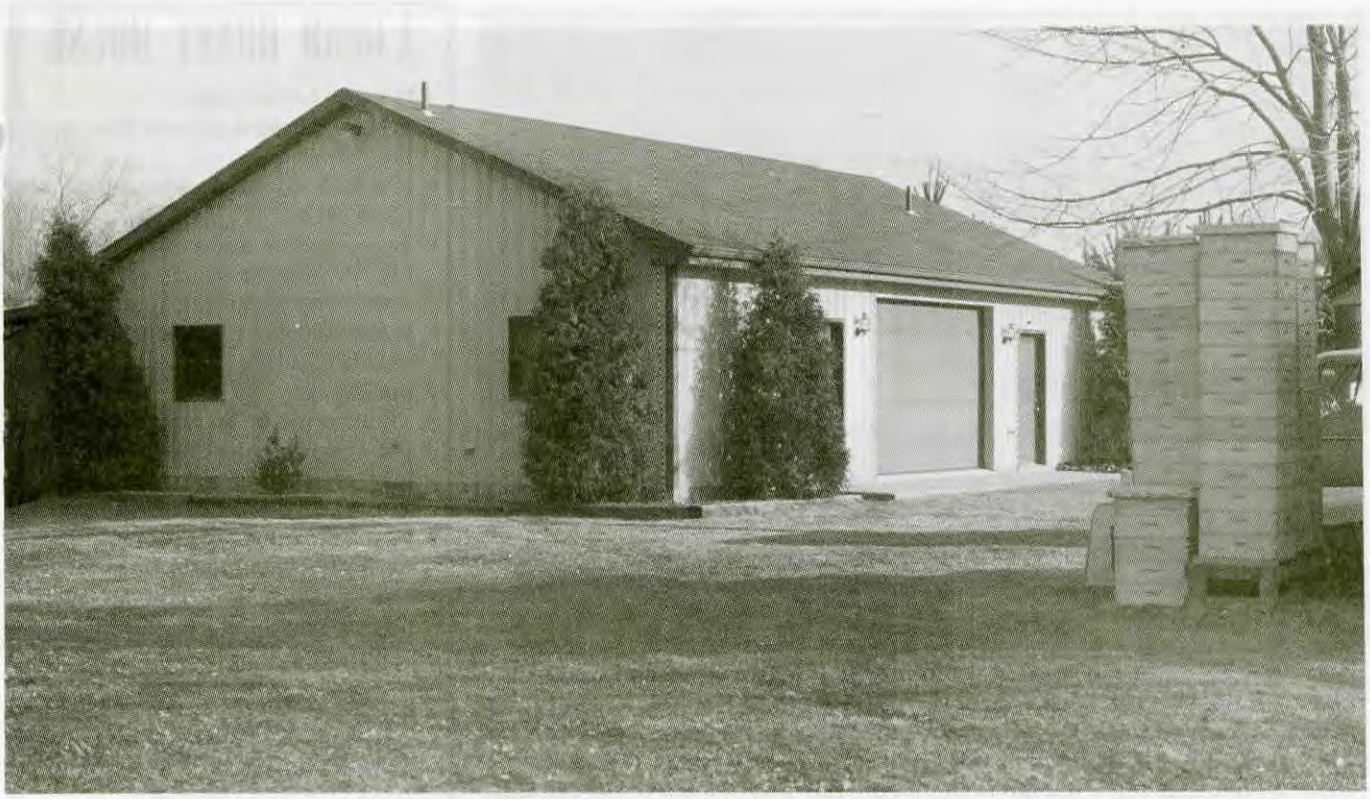
SWARM

marshall dunham

One of the nice things about catching a swarm of bees is that it really doesn't take much special equipment – usually not even a bee suit.

This swarm landed on a discarded box on Dave Kerr's burn pile in Oregon's Willamette Valley. Clinging together in the swarm state, the bees could be picked up by the handful, as Bee Culture's *Bee Plants columnist and co-author of* Nectar and Pollen Plants of Oregon and the Pacific Northwest, *B.A. Stringer, is seen doing here.*

Most of the bees that landed on the old equipment were transferred to a new hive by being gently shaken off the frames. Rose Kerr pulls a frame while Dave jiggles the bees off another frame just over the new box and B.A. Stringer lends a hand.



Building Your Honey House

mark headings

A honey house conjures up images of honey and beeswax aromas, wholesomeness, natural products, serenity, harmony with nature, simplicity, pleasure, sweetness, stickiness, pastoral settings and harvest/reward time. For my family, it has also been a time to work together. One of the joys of beekeeping is that it can be a family activity. Years ago, my youngest son, at the age of two, was already pounding eyelets in frame end bars while other members of my family worked on assembling and wiring frames and nailing hive bodies and supers. A.I. and E.R. Root wrote the following in the 1929 edition of *ABC and XYZ of Bee Culture*: "Or one man can do all the work, take out the combs, load, drive to the central plant, extract and return the combs to the hives. It is right here that the wife, mother or sister can be of great help."

In addition to honey extracting, the honey house is also a place to work on honey packaging and candle making. Likewise, planning for the next honey-producing season and working on hive construction and repair are other excellent activities to be done in the honey house.

A properly designed honey house and timely extracting can restore the joy of honey and beeswax processing. Once you have decided you need, or at least want, a honey house, the next step is to envision what it should look like, its size, what design features to include and where to locate it. You need to decide whether to build it yourself or hire a builder. It is then time to estimate the cost and decide what you can afford. I would recommend adding an additional 25 percent to the original estimate. You will then be less surprised when there is a cost overrun. If your plans are over-ambitious for the size of your operation, consider that the cost can be justified by all the additional potential uses of the building.

In 1987 I drew up plans for a new honey house. After I had selected a contractor, the building project moved forward. By that time, I was managing approximately 65 colonies and, therefore, needed a facility that would accommodate that size of operation, plus allow room for expansion. The size of the building I selected was 32' by 44' which, I estimated, could accommodate up to a 500-colony operation. The floor plan is shown in this article. A cement footer was poured, followed by a cement block foundation on top of the footer. Plumbing for electricity, water, and sewer lines was put in place, and then, a cement floor was poured with floor drains placed in the extracting room, the hot/storage room and the vehicle unloading room. A one-story wood frame structure was then erected, insulated and covered with metal siding. The roof was constructed of asphalt shingles.

When facing the front of the building, you see a door on the right and one on the left with a one-vehicle width overhead garage door in the center. The door on the right opens into the storage and sales room, which has heavy-duty shelving to accommodate four to five-gallon pails of honey. The room connects to the honey-extracting and wax-processing room, which is equipped with a Maxant 20-frame radial extractor, sinks with hot and cold running water, a hot and cold water faucet for attaching a

Continued on Next Page

HONEY HOUSE ... Cont. From Pg. 277

hose to wash down the floor in the room, an electric stove and a hot water heater. A door on the back side of the room leads to the hot/storage room, which has no windows. There is a wall fan which opens to the outside. A low-wattage light bulb is located in front of the fan. When the door is closed, the room is dark; but when the fan is turned on, the bulb in front of the fan lights up. Stray bees brought in with the honey supers are attracted to the light and consequently, as they enter the fan, are expelled. This room also has shelving for storing empty honey containers, and other equipment. All three of these rooms on the right side of the building are equipped with thermostatically controlled electric baseboard heaters. All the walls and ceilings in the entire building are covered with dry wall, and fluorescent ceiling lights are mounted in each room.

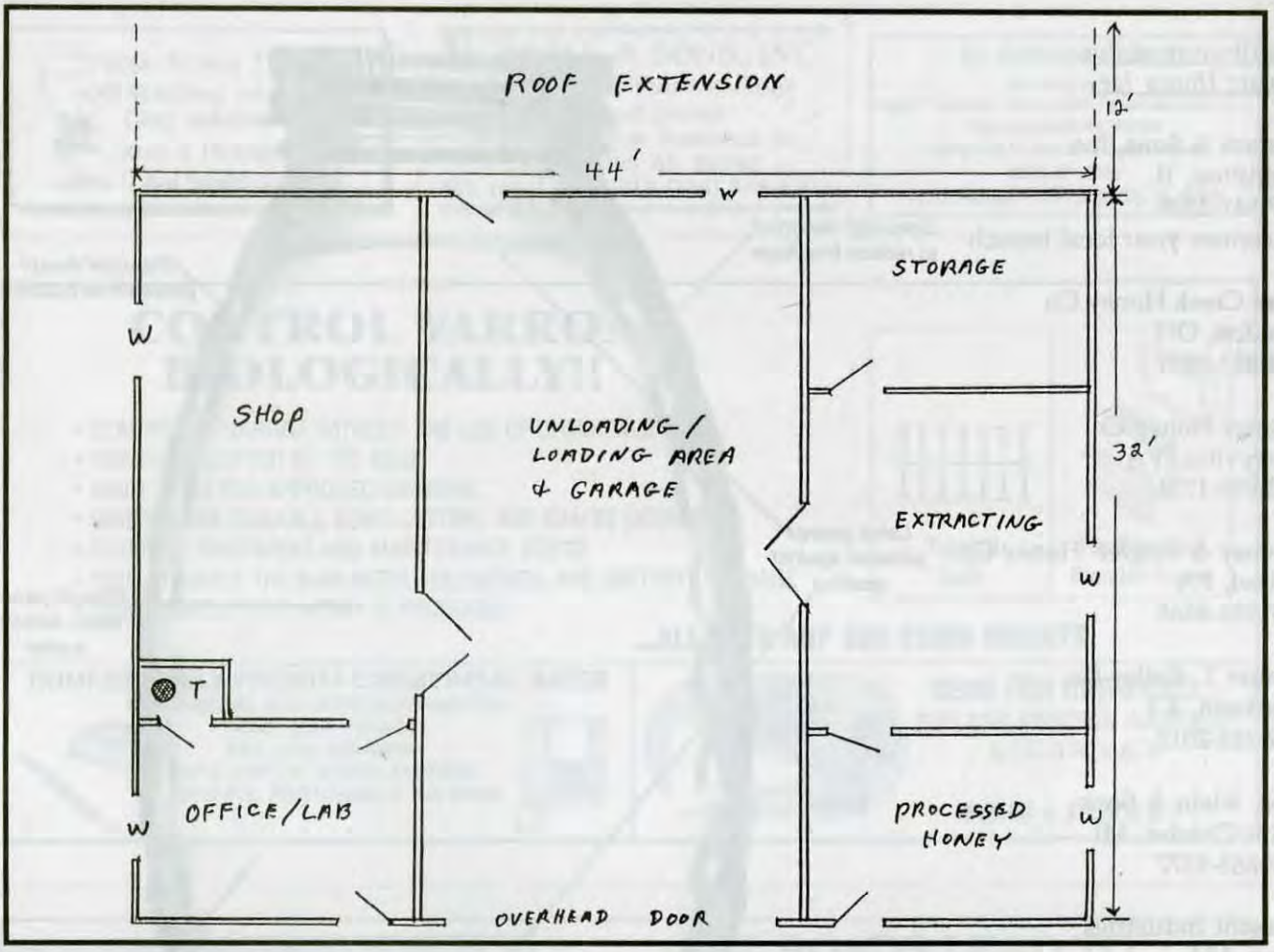
The center vehicle unloading room has the overhead garage door (with automatic opener) in front and a single door leading to the outside in the back. The room has a high cathedral ceiling which follows the slope of the roof. When entering through the garage door, there are double doors on the right side wall, which lead into the extracting room. Above those doors (near the point of the roof) is a small metal-covered door opening into attic storage space. On the left side wall, there are double doors leading into the woodworking shop. There is, likewise, a small metal-covered door above these doors opening into attic storage space. The metal sheeting on these small doors is a fire safety feature. The room was designed for backing in a vehicle to load and unload honey supers, etc. This room can also serve as a storage area for various items, including a vehicle or a boat, when honey is not being harvested.

When facing the front of the building again, the left door opens into the office/laboratory. This room is equipped with sinks with hot and cold water, a bench table and a small side room with a toilet. The room also has a thermostatically controlled electric baseboard heater. A door on the back side of this room leads to a woodworking shop (with workbench and tools) for building and maintaining equipment. A faucet with hot and cold water is also located in this room. The room can be heated with auxiliary space heaters when desired. The shop and extracting rooms are also wired with 220 electrical current.

There are outside water faucets on two sides of the building and electrical outlets on three sides. These have proven to be very useful for washing equipment, for sandblasting and for a variety of other uses. The building has exterior door lights and a large automatic yard light. More recently, a 12-foot roof extension has been added to the entire length of the back side of the building for other uses. One way to help justify the cost of such a honey house is to find other uses for the building as well – especially when honey is

A GOOD HONEY HOUSE

- It must be bee tight.
- It should have a cement floor with floor drains.
- Hot/cold running water and sinks are a must.
- Separate hot and cold water faucet for attaching a hose to wash down the extracting room.
- It should have electricity with excellent lighting and plenty of wall outlets.
- There must be an adequate number of screened windows and ventilation.
- The walls should be insulated.
- Fire safety features including fire extinguishers should be planned.
- The heating capability (electric or otherwise), must consider a storage room full of honey supplies.
- An indoor vehicle unloading area is ideal.
- A mechanism for expelling stray bees from the building is also a must.
- The extracting and wax-processing room should be roomy and expandable.
- Room for storing and selling what you produce.
- A hot room for supers and storage.
- A woodworking shop that can be used for other purposes is a good idea.
- An office/laboratory room with running water, a sink, electricity and a window.
- Indoor toilet.
- The building site should have good drainage and year-round vehicle accessibility.
- An attic storage area accessible from vehicle unloading area works well with some designs.
- Adequate electrical outlets and water faucets on outside of building.
- Heavy-duty shelving to accommodate four or five-gallon pails of extracted honey in the selling room help out a lot.
- Double doors between vehicle unloading area and extracting and woodworking shop rooms.
- Check state and local rules and regulations concerning food processing facilities. You may need to add other, more elaborate conveniences to bring the building up to code.



not being harvested and extracted. For several years, my children also used the extracting room for their small business of growing alfalfa sprouts.

It is interesting to note floor plans for honey houses described by authors years ago. Many of the features they considered important are some of the same ones that I consider important today. One such article was written by E.L. Sechrist in the March 1937 issue of the *American Bee Journal* entitled "Honey House and Workshop." A number of other sources on honey houses found in the *American Bee Journal* include the following: "The Commercial Honey House" by G.F. Townsend; "Honey House Layout for the Small to Medium-Size Commercial Beekeeper" by editors Joe M. Graham and William R. Carlile; "Richard Blake's Flow-Through Honey House" by Bill Carlile; and "Solar-Heated Honey House" by T.E. Douglass. Another interesting article, published in *Gleanings in Bee Culture* in 1953 and written by John W. Holzberlein, Jr., is entitled "One Man's Honey House." Everett F. Phillips, in 1928, wrote about some of the desirable features of a honey house in his book entitled *Beekeeping.*

If you're contemplating building a honey house, you need to determine what your needs are and what your long-range goals are. The number of colonies you have or plan to have, as well as financial resources available, significantly impact what size and type of structure to build. Even a very small, simple, but well-designed structure can be a great joy to use. Research the possibilities in the literature and visit some honey houses to gather ideas on how you would like to build yours. Plan and dream a lot! Much of the joy comes from dreaming about the possibilities and then incorporating those features that are uniquely yours. BC

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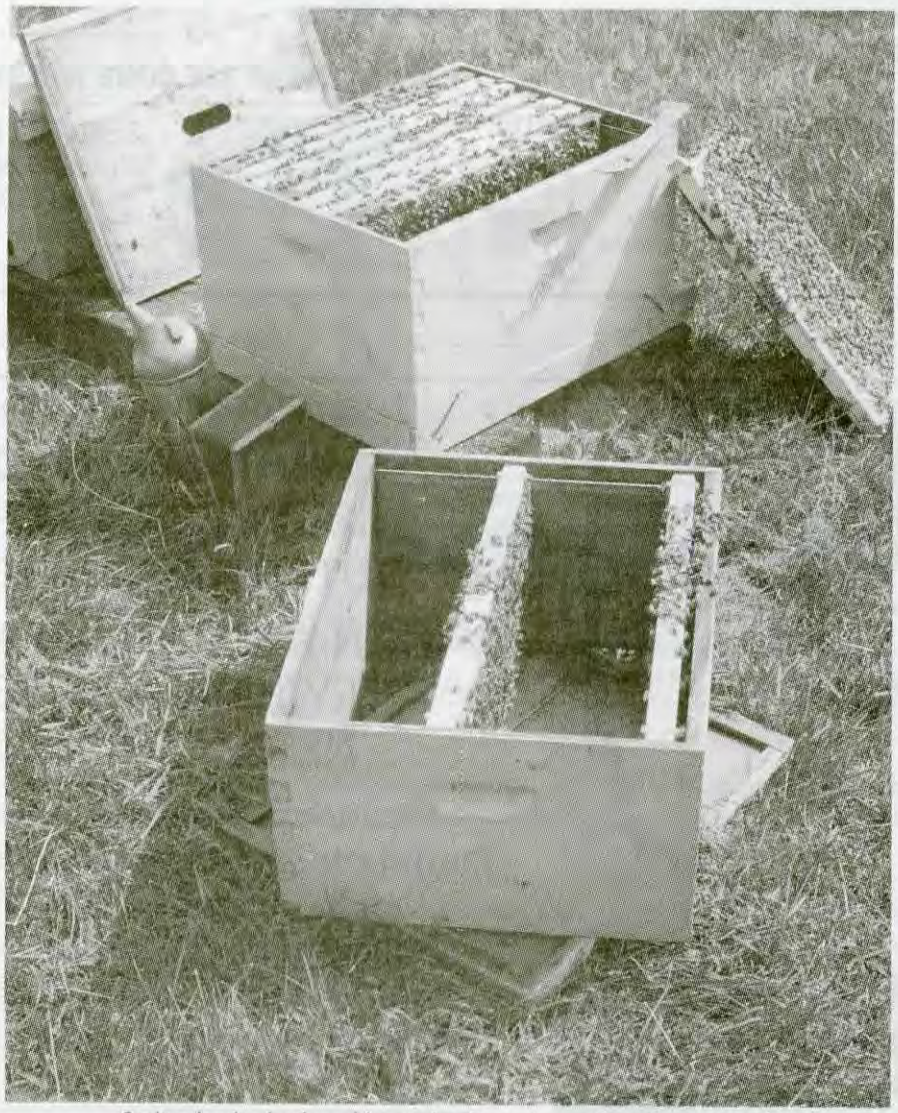
SPRING MANAGEMENT
There's More To This Than Swarm Control

richard bonney

Spring management – what is it? We throw the term around freely and usually have some sense of what it means, but how often do we think it through in some coherent manner? Thinking of it casually, without forethought, we would probably define it as the activities centered around spring cleaning and initial supering. It's so much more, though. Spring management actually starts, or should start, with the onset of spring, in late March. That's when we concern ourselves with feeding, with early thoughts of swarm control and with making plans for the season. But now, those preliminaries are past. It is time to get into our hives in a serious way and do those chores that most of us have in mind when we think of spring management. It is also time to find out if some of those earlier plans can come to fruition this year.



Spring cleaning is when a hive receives its maximum disruption as everything is pulled apart for inspection.

We need an immediate plan, though. There's nothing involved other than some forethought as to why you are going to the hives and exactly what you will be looking for. For instance, perhaps you would like to make increase this year, or produce comb honey, or maybe you have been wanting to try a two-queen colony. For each of these your hives need some specific attributes – a prolific queen, good population and good health, for starters. Now is the time to find out if you have these qualities and to chose the hive or hives you will use.

Start with a checklist, mental perhaps, but something, and don't delay. Spring is a rushed season for most of us, and it is easy to put off these chores until later. However, putting off beekeeping chores seldom works to the advantage of the bees *or* the beekeeper. The bees are working to their own schedule and are totally independent of us. It is up to us to keep up with them. Spring chores are straightforward, though, and actually don't take long if we're prepared. But first, when specifically, should we be doing all this?

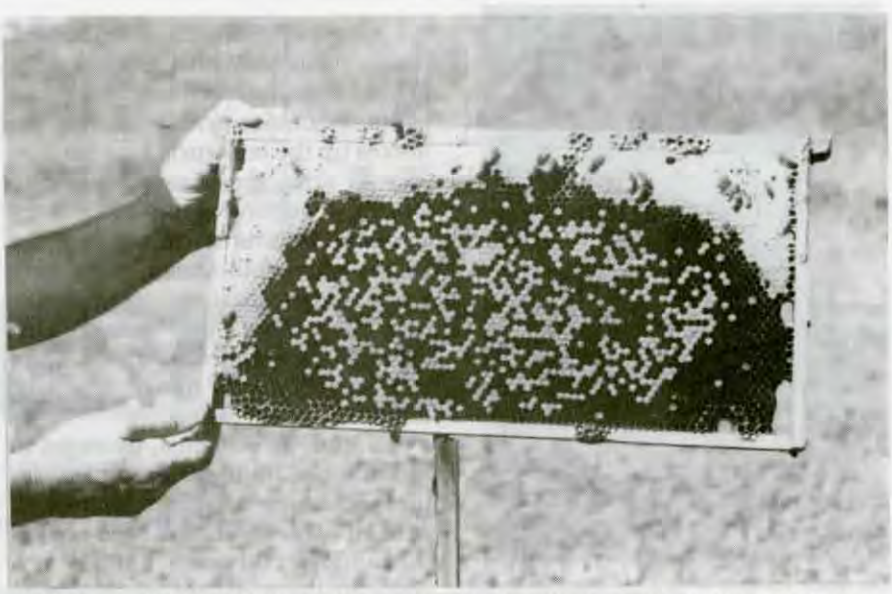
Although spring officially begins in March, for most of us, March is no time to be messing around inside the hives. Even April can be questionable. It is best to ignore the calendar and wait for warm weather. I usually take off the winter

insulation board and the mouse guard in April, but that is mostly a sop to my urge to be doing something. It doesn't hurt the bees to leave the hive buttoned up a little longer. For our purposes, spring can be defined as starting when the first sustained nectar flows begin. We have intermittent nectar in the early weeks, willows and maples, for instance, but here in the Northeast, that first sustained flow is from dandelions, in late April and early May. For me, it is usually around May 1 when I swing into action, and the first chore is the obvious – spring cleaning – but several other chores get mixed in as well.

Spring cleaning needs a nice day, warmish and preferably with a nectar flow to preoccupy the bees. This is probably the most disturbance these bees will have all season unless the hive is used later to make a split or a nuc, and even that may be minimally disruptive since we are doing some of the preliminary work now. For the cleaning to be done properly, each component of the hive should be removed, scraped, inspected, perhaps even replaced with another, before the hive is reassembled. A spare bottom board is very handy during this operation. Removing a bottom board for cleaning means complete disruption of the hive, as all the parts are set off to the side, at least briefly. When you pick up the bottom, you will immediately see bees hovering around the location where the entrance was located only moments before. The faster that board can be replaced and at least one hive body set back on it, the happier the bees will be. A spare board means that you can remove the old, replace it with the spare at once and then clean and scrape the old one at your leisure once the hive has been reassembled. This newly cleaned board can then be used for the next hive, assuming you have more than one.

This is also the time to replace hive bodies or covers that need to be repaired or repainted. Keep extras of each on hand, and after a while, you will wonder how you ever got along without them. Make any necessary exchanges as you work through the hive.

In this mid-spring period, the bees are usually occupying only one hive body, the top one, having worked their way up there over the winter.



This is a great time to evaluate the queen. A spotty brood pattern suggests requeening is in order.

This is the ideal time to cull frames from the other hive body, the empty or near-empty one. Get rid of any that are broken or deformed, especially those with old, black comb. If nothing else, it is a sanitation measure. Such combs are a repository for disease organisms that accumulate over time, inactive at the moment perhaps, but always a latent threat. I try to replace 20 percent of my comb each year so that no brood comb is ever more than five years old. If there is any question of condition, hold the empty frame up to the sun. If you cannot see light coming through the comb it is a candidate for replacement. During the summer season to follow, keep frame recycling in mind. As you come across candidates for replacement, shift them to the lower hive body as possible. This may take more than one move if they start out in the center of the brood nest, but there is no hurry. Mark them with a crayon or grease pencil so you can identify them easily next spring.

Now, while you are digging around in there, is the time to make a judgment of the queen. We are approaching the peak of the brood-rearing season, and the queen should be laying her requisite 1,500 and more eggs per day. If you don't see evidence of this laying rate, along with a good, tight brood pattern, perhaps she should be replaced later this season. Make a note.

As you are making this evaluation of the queen and inspecting the brood, you have an opportunity to determine if the colony is a candidate for being split, or for yielding up a nuc, or for being used in any other way you may have in mind. This is where your record-keeping system becomes important. You do have one, don't you? Be sure to make notes. Assuming you have more than one hive, it is easy to lose track. Don't force yourself to go back through the hives later to discover which one needed the new queen, or which one you planned to split, or which one looks like a good candidate to make comb honey. Instead, write it down somewhere. A notebook serves well, but I have been satisfied with simply writing notes on the outer cover with a grease pencil. These notes persist for at least several weeks, and usually for the full season, and the cover does not get lost or left behind as so often happens to a notebook or card. Of course, if you keep a notebook, you can review it at home later, so perhaps you need both.

All through this procedure, keep the possibility of swarming at the front of your mind. Presumably, you have been thinking about it for a month or more as you observed the progress of the season. At some earlier time, you made a preliminary check to determine if feeding was necessary and to evaluate the swarm potential of the colony. Now is the time to reevaluate. Again, as you work, in addition to the other things we have thought about here, note the absence or presence of large amounts of drone brood, the number of queen cups and the possibility that the bees are feeling crowded or congested. If

Continued on Next Page

The hive is about to be stripped down for spring cleaning anyhow, so take the opportunity to replace and recondition some of those shabby hive parts.

MANAGEMENT ... Cont. From Pg. 283

swarming seems a possibility, review your control and prevention techniques and decide on the appropriate moves for each specific hive.

Then, with all your cleaning, replacing, shuffling of parts and specific observations complete, reassemble the hive. As you reassemble, reverse the hive bodies, placing the full one on the bottom and the empty or near-empty one on top, assuming of course, that the original bottom box is empty or nearly, and that you are not splitting the brood nest.

After reversing the hive bodies, expect the best. With the dandelions in full bloom, followed quickly by tree fruits, brambles and whatever else makes up the late-spring nectar flow in your area, the bees will begin to fill that second hive body very quickly. This is a time when the colony often gets ahead of the beekeeper. Put at least one super on the hive right away – and watch it. Incoming nectar takes up space, more space than stored honey, and this can lead to congestion.

Nectar, as collected, averages in the range of 35 to 40 percent moisture. A few nectars go as high as 70 percent. Of course, the bees are going to convert this nectar into honey, reducing the moisture content down below 19 percent, but this takes a few days. As it is being processed, this bulky nectar, or green honey, requires temporary storage space in the hive. If you have supers on in plenty of time, there should be no problem, but if you delay and space becomes limited, the bees will store this ripening honey anywhere, even in the brood cells. Later, they will consolidate it in the honey storage area, but in the interim, that feeling of congestion begins to build. Get those supers on in plenty of time and stay ahead!

Now, take a moment to think about someone else's problems. Swarm season is near. You know that your colonies aren't going to swarm – well, you don't think they're going to swarm – but what about the other guy? You're bound to get a swarm call or two. Will you be ready, and what will you do with the swarms you capture?

Your just-completed spring cleaning and inspection have shown you which colonies might benefit from the addition of a swarm. Or perhaps you would like to hive that swarm and have a new colony. With this latter possibility in mind, think about which of your existing colonies could give up a frame or two of brood to a newly hived swarm to help it get off to a good start. Make sure that this information is in your notes.

A final thought as you complete your inspection and make your notes – are you planning on an observation hive this season? Perhaps you are not quite ready to set it up, but now is the time to identify the donor hive. Since an observation hive is small, usually only one brood frame, it does not need a prolific queen. Plan to take the queen, along with a frame (or frames) of brood, from a colony that you have identified as being a candidate for requeening. Put that in your notes, too.

Maybe you had better buy an extra grease pencil. BC

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

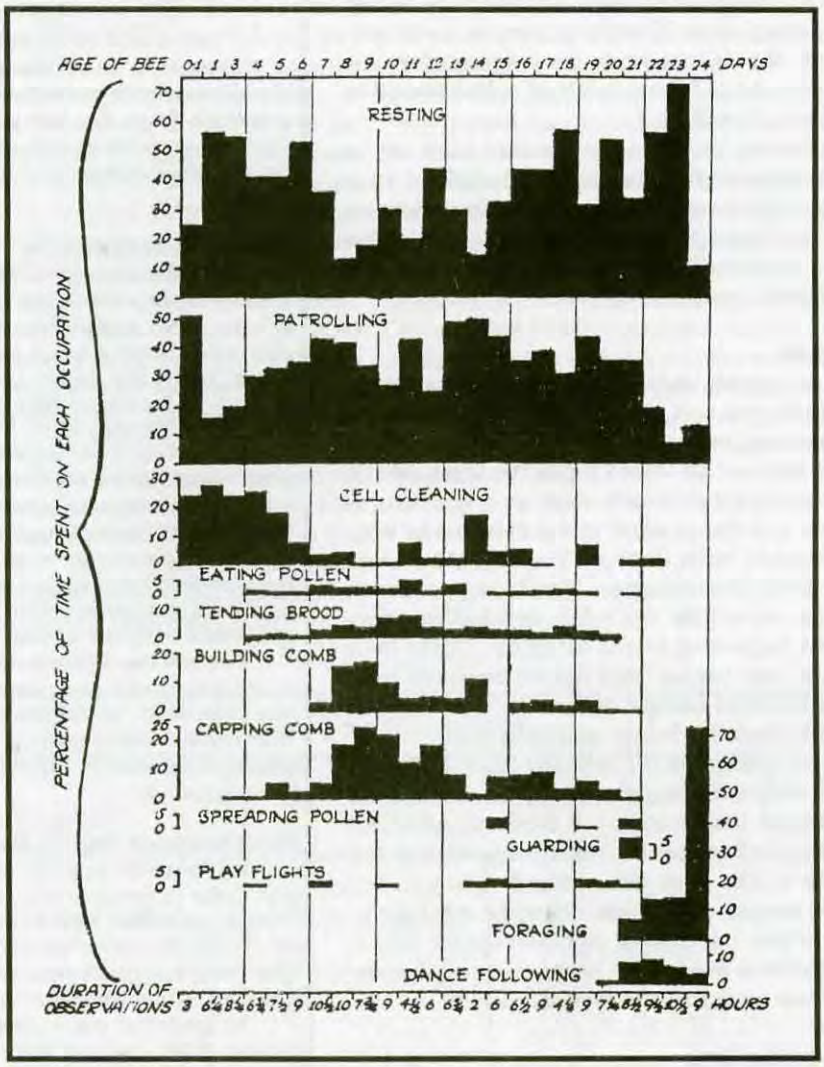
OBSERVATION HIVES

dewey caron — thomas webster

Part V

FORAGING

One of the easier activities you can carry out with an observation hive is to follow the activities of foragers. Foragers are older workers who leave the hive to collect nectar, pollen, nectar and pollen, water or propolis. Since foragers leave during favorable weather and return to the hive with their bounty you can mark them, time their trips and even follow their movements inside the hive when they are not outside foraging.



Pollen Foragers

As you follow foraging behavior, it may be easier to focus on pollen foraging. Pollen comes in different colors, depending on the flower. Usually an individual foraging bee will specialize in one type of flower, while the hive as a whole will tend to diversify so that many types of pollen (as well as nectar) are brought in. Yellow, orange, white, red, purple, beige and other colors of pollen can be seen, depending on what's in bloom. Sometimes you can figure out the floral source of the pollen by scouting the area and watching bees on flowers. You may have to really look since bees will travel up to three miles for forage.

Pollen foraging is most intense in the morning, so if an afternoon study is scheduled, you may want to have a backup exercise in case you don't see much pollen coming into the observation hive.

Most of the foragers you see returning to your observation hive will be collecting nectar, but some may be collecting water There will also be bees learning hive landmarks and practice-flying. A few foragers will collect propolis, which you might initially confuse with pollen. Propolis is usually darker in color and looks greasy; the foragers won't be able to remove propolis from their pollen baskets (as they do the pollen) once they enter the interior of the hive. Once you know what to look for, foragers can be followed as they enter the observation unit, and you will be able to determine from their behavior what they forage on while they're outside.

Foraging Behavior

How many types (colors) of pollen are coming in? Use a stopwatch to start and end the observation period which may be one to five minutes. During that time watch the bees and record the colors of pollen on

the legs of bees coming into the hive. How many types of pollen were brought in? Which type was brought in the most? Why were some types brought in more than others? If a certain number of pollen loads was brought in by bees in one minute or five minutes, how many would be brought in in an hour?

Why does an individual bee bring in only one type of pollen? We know a bee is more efficient if it specializes in certain flowers. Foragers actually learn to harvest pollen. They are clumsy at first, but with a little practice, they learn how to forage very quickly. When the blooming period of one type of flower is over, the bees specializing on that type of flower may learn a new type. What other animals need to learn things?

Why does the hive as a whole bring in different types of pollen? Is it to get a diversified diet? Pollen is the source of protein, vitamins and other essential nutrients for bees. But since pollens vary, it's best for the hive to get a little of everything if possible. Also, bees collect from a variety of flowers as insurance. When one type of flower stops blooming, they are still getting food from the others while they search for new flowers. Can you see different colors of pollen stored in the comb? (Use a flashlight.)

On the following page is a sample data table use to gather information on foraging behavior. Collect your data at different times and repeat observations several times a day for three or four consecutive days. Can you see some patterns? Why is there such variation? Compare different times of the year.

Nectar Foragers

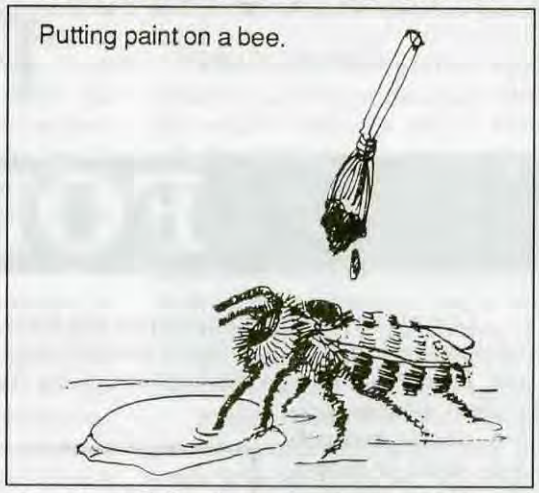
It is not as easy to differentiate the nectar foragers. A technique you can use is to capture and kill a number of incoming bees and then remove their honey stomachs. To remove an intact digestive tract, which will include the honey stomach, capture a bee returning to the hive, cut the head off and pull from the very tip of the abdomen with forceps. The digestive tract will separate from the abdomen. The honey stomach will be obvious, especially if it's full, as a bulbous section before the beginning of the intestine. Some bees will have water, not nectar, and not all bees will have full loads. You should sample several bees at various times and rank them for honey stomach size.

This sampling method is obviously destructive – it only tells you what *was* happening. At the same time you are looking at honey stomach contents, you can assay for pollen collection as well by examining the pollen baskets of the bees you sample. Can you tell what bees are nectar collectors? What percentage of pollen foragers also had honey stomach loads? Was it more likely that one would find contents in the honey stomach of a bee carrying one type of pollen?

Foragers Inside the Hive

You can watch a returning forager once she enters the hive. This may take some real concentration, but good lighting helps you to follow the bee's movements. You may follow a marked forager or a pollen forager with full pollen baskets as she makes her way through the hive. What does the forager do? Sometimes the bee will start dancing (we will discuss this in part VII). Can you tell if she dances? Other returning foragers,

MAKE IT EASY



In order to follow foragers and other inhabitants of the observation hive more easily it is recommended that you mark them. You can put a dab of paint or glue or a distinctively colored and numbered tag onto a bee's thorax to make it easier for you to follow one particular individual.

Using Paint To Mark Bees

The easiest and least expensive way to mark bees is to put a dab of paint on the thorax of each bee you wish to follow. Model airplane paint (Testors™) is readily available at any hobby store. A paint marking kit is sold by the Walter Kelley Bee Supply Company ($5.50) or a marking pen can be purchased from Apicom ($4.95).

To distinctively mark a bee, grasp her on the sides of the thorax with your fingers or with a pair of "soft" forceps – available for $3.50 from biological supply companies such as Carolina Biological, Burlington, NC or Gladstone, OR or BioQuip, Gardena, CA. Be careful not to crush or injure her when you grasp or hold her. Once the bee is immobilized, apply a *small* amount of paint (tip of a brush or a toothpick) on the thorax region. Be sure not to get paint on the bee's head or abdomen.

You can use different colors to mark additional bees or use a mark of two or more colors so that each bee you mark can easily be differentiated from all the others you have marked. After applying the paint dab, hold the bee a couple of seconds to allow the paint to dry a bit before you release her.

Using Numbered Tags To Mark Bees

If you prefer, you can purchase tiny numbered tags that come in five colors to mark bees. They are available from Apicom (520 West 112th St., Suite 9A-9, New York, NY 10025, Ph. 1-800-704-9273 and cost $7.33 a set. These tiny discs are glued onto the thorax with a fast-drying glue that is included with the numbered discs.

To apply the discs place a dab of glue on the lower surface of the disc just before catching the bee you wish to mark. Next, grasp the bee firmly by the sides of the thorax and use forceps to place the disc, numbered side up, on the shiny spot of the bee's thorax. Allow the glue to dry momentarily before releasing her. Do not get glue or discs on the bee's head or abdomen.

You may get stung while doing this until you learn how to grasp the bee properly to mark her. We recommend that you practice holding and marking drones before attempting to mark workers or queens.

particularly the nectar foragers, will give some of their honey stomach contents to other bees. Pollen foragers will back into cells and kick the pollen clumps off their legs. Look for the two little clumps left inside each cell. Sometimes the bees are so hungry for pollen they will snatch it off the returning foragers' legs and eat it right away, before they can unload it.

As you follow returning foragers, begin to tally up the behaviors you see. This will take a little practice and lots of patience when you first start your observations. How many bees do foragers exchange food with? Does a nectar forager return to the field faster than a pollen collector? How soon before a returning bee leaves again? You can make a large number of counts once you mark foraging bees. You can mark several bees and follow them over several days.

Outside, you can establish artificial feeding places (sugar syrup, water and even dry pollen) to attract and mark your bees. You can measure and time field activities, time and route from hive to station, time between trips and other features.

With the foragers, you can perform various experiments on taste and smell. Offer, in identical containers, equal amounts of different sugar concentrations and record the volume taken by the bees (or time uptake and stop the experiment when the first container is emptied). Determine if bees can differentiate between small differences in sugar concentration. To obtain a 10 percent and 30 percent sugar solution, mix weight to weight or weight to volume of sugar and warm water. Do the bees select the more-concentrated solution and take it faster? Add a scent (such as peppermint or anise) to determine if bees have a preference for scented over plain solutions or a preference for a particular scent. You can add salt, alcohol, flavors and other things to the sugar to determine the reactions of the bees. Also, you might determine if bees prefer other sugars such as brown sugar, corn syrup, powdered sugar, etc., over ordinary table sugar.

Let your imagination run wild. There is so much you can do with foraging behavior outside and with the behavior of the marked foragers that enter your observation hive. Do observations that you find interesting. But beware – as you find you can answer one question about what bees do, it will open up many more interesting questions you might want to find answers for.

Special Project: It is difficult to accurately count bees leaving or returning to their hive when flight is extensive. By isolating outgoing bees from incoming bees with separate channels, you can get more accurate counts. With a little training, the foragers will become accustomed to the entrance, and you can obtain an accurate record of flight activity without having to spend as much time taking data. BC

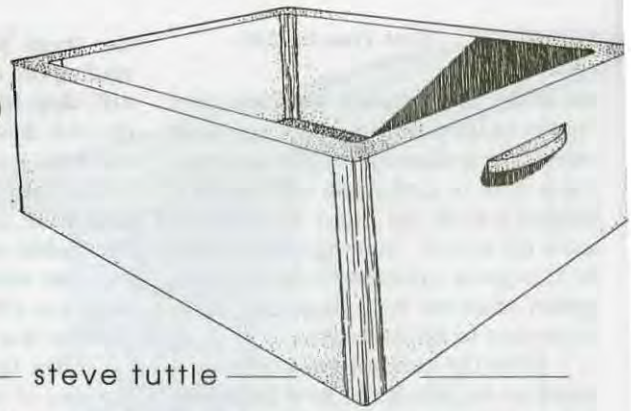
Dewey Caron is Professor and Extension Specialist in Apiculture at the University of Delaware.

Thomas Webster is researcher and Extension Specialist in apiculture at Kentucky State University.

Foraging Activity Graph

Weather Conditions					Flight Level				Number Nectar/Water Collectors		
Date	Time of day	Temp.	Wind	Sun	No. Bees	Time	Bees/ Time	No. Pollen Collectors	Sm. Load	Med. Load	Large Load

CONCRETE IS FOREVER



steve tuttle

Yes, it is, and concrete hive bodies cost less than $2.00 to make. So, the obvious question is: Why doesn't everyone use them? Wood is not as plentiful as it once was, and concrete hive bodies are much better than the caves bees have lived in for centuries. Or, do you feel there is no need to reinvent the box? Until now, perhaps. But the knots in wood and the special equipment needed to dado, groove and notch that cost "big bucks" are just two reasons to take your first look at concrete. Oh, sure, you can buy wood hive parts, but you still have to glue, nail and paint. All that takes time, and money. It's time and money the beekeepers I know don't have a lot of, so they aren't fond of parting with either.

First, let me say that we have used concrete hive bodies and bottom boards for four years, because, like the pyramids, they don't go away. They cost only $1.50 to make, and that's for both the bottom board and a 10-inch hive body. You can make both in less than an hour.

Both wood and concrete hives have to be painted, wood every few years or so, but concrete, only once. If wood is damaged or rots out, it must be painstakingly repaired, sometimes requiring the use of metal cleats and special cuts of wood for inserts which never really give you a "good as new" end product. Sometimes a repaired piece of equipment is dangerously weak, and the repair takes a lot of time or doesn't get done at all.

Concrete, on the other hand, can be repaired by mixing up a little concrete patch and slapping it on. If the concrete cracks when it's still green, I just patch it with a little roofing caulk. Tar caulk is cheap, and it lasts forever. We use it to join the bottom board to the hive body. Hunters like to shoot at beehives, and even a bullet hole from a hi-powered rifle is fixed in a few seconds with a little sand and cement.

Concrete is heavier than wood, perhaps twice as heavy. I say, "So what! If you're carrying around wooden hive bodies by hand, you're asking for a bad back anyway." Use a dolly or some kind of lift. You'll be no good to your bees if you're lying on your back in pain. Besides, once your hives are in your bee yard, you shouldn't have to move the lower hive body, even to do splits.

I don't recommend concrete hives to migratory pollinators, but if you want to use them on a pallet or movable flatbed, they'll serve you forever.

How do the bees react to concrete? They do very well, and I cannot tell the difference between concrete and wood where colony performance is concerned. When the concrete hive body is buried in a hillside, the hive is cooler in the summer and warmer in the winter. The hive should be well-painted on the outside and a barrier of tar paper wrapped around it where the soil and concrete meet. I put my concrete hives on scraps of metal siding so that moisture can drain away from the bottom. Then the hive stays dry inside all year long.

Concrete hives are impervious to all insects including moths, ants, even termites. Moths like to get into the hive body or brood chamber, but concrete has cut our moth problems down to nothing. We don't stack concrete hive bodies because they would be difficult to switch in the spring. Concrete on the bottom protects the woodenware on top from moisture and provides a good, solid base which is not possible with stilts or wooden planks. Woodenware above the concrete lasts longer and is still a valuable asset to a beekeeper who uses concrete hive bodies on the bottom.

You can make a set of forms to build your concrete hives by taking a good hive body and putting wood around it. Connect the corners with hinges rather than nails so that the forms will come off. Inside forms must fold inward, and outside forms must fold outward. I've made a drawing of the forms you'll need to build your concrete hive bodies. The base must be made with some guide slats, as shown, and inside, a flat piece of wood must be nested at the top of the form. That further squares up the form, but most important, it gives you a place to put your sloppy mortar and scrape it over to the side where it flows down into the mold.

Remove that board when you are ready to take the mold apart. Tip the whole thing over and tap up gently to remove the bottom. The bottom will come off, and the sides will then be easily removed after you take the pin out of one of the hinges or release the latch. Naturally, if you make only one set of forms, you'll be able to make only one hive body each day.

The bottom board is much easier to make, and if you remember to build in at least 10 degrees draft, it comes off easily by standing it on its edge and tapping. If you are really wise, you will build the mold so that there is a ramp or natural angle in the base so water can't come into the hive even if it is tilted back a little. You'll need to put form release on the molds – diesel fuel mixed with a little oil is a good form release.

Notice the indentations in the forms on the outside. They are for hand grips. You could also use glue and screw plugs there so that the grips go in, as they do on wooden hives. The strips at the bottom are to keep the mold in line so that all the sides are the same thickness and remain square as the mold is filled.

After putting 9-1/2-inch strip of chicken wire in the molds, simply mix three shovelfuls of sand with one of cement. After filling the mold, hit the

CONCRETE ... Cont. From Pg. 289

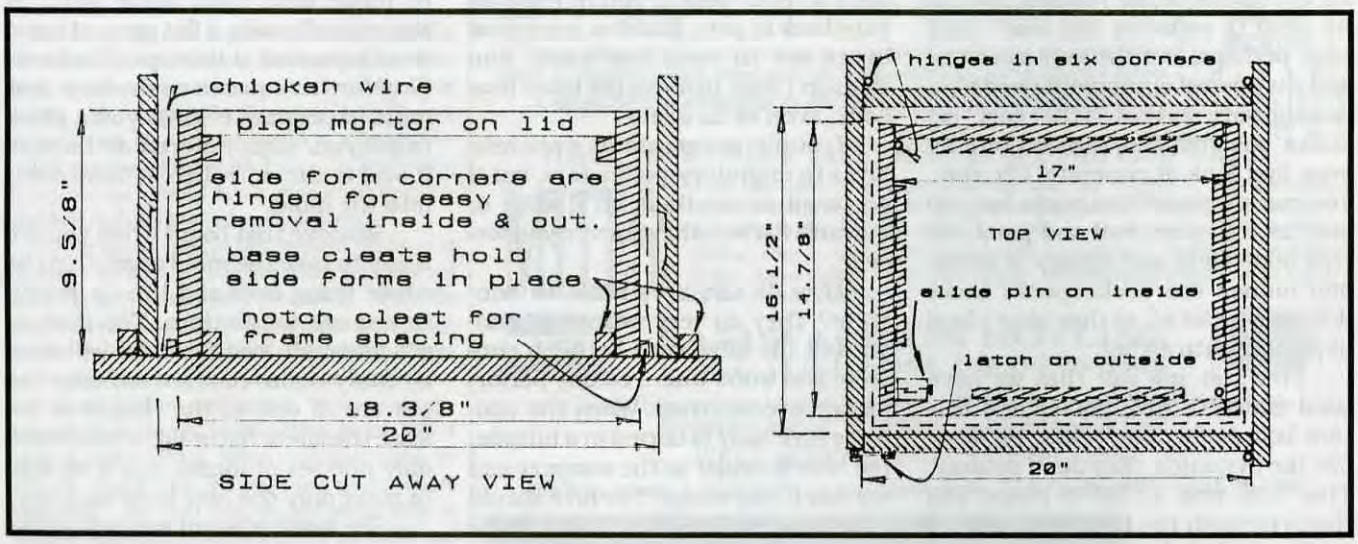
mold the sides lightly with a rubber mallet to let it burp. Leave your mold overnight and remove it the next day. Your hive is green and soft when it comes out of the mold. It needs to cure for a week. Moving it too much at this point will cause cracks. Cover green concrete with plastic to allow it to cure to full strength.

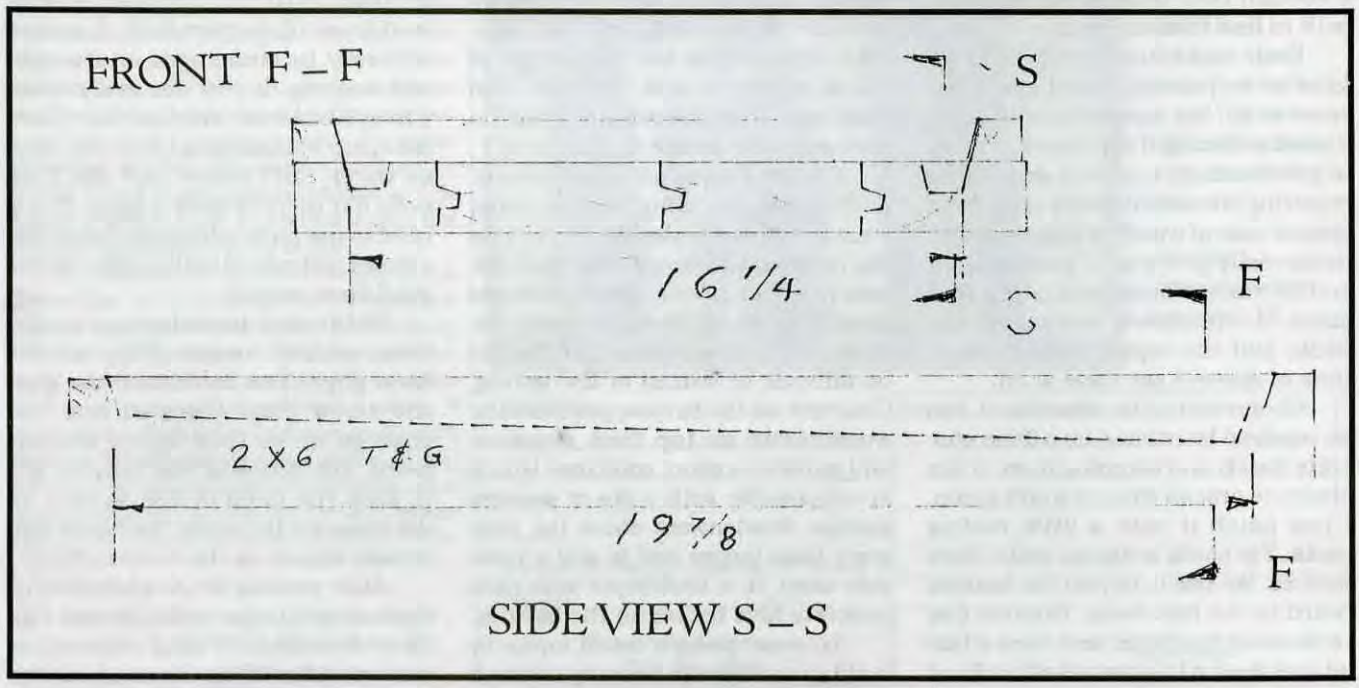
After the cement has cured for a week or so, stack the new hive bodies up, sprinkle them with water and cover them with plastic again. When you are ready, after 14 days or so, take off the plastic. The hives should be dry and ready to put together. Take them to the place you are going to use them, join top and bottom with roofing tar, caulk and paint inside and out. Any kind of outdoor paint will do. Put down some moisture barrier material and be sure that the place where they are resting is flat. If you were wise, and you built in a slope on the inside of the bottom board floor, you can stand the hives up straight with no tilt, greatly reducing the chance of a tall hive tipping over.

I like to make the moisture barrier out of some metal siding or old roofing steel. That allows for an area in front of the hive free of weeds for 10 or 20 inches. In this way, with a hive on the ground and the weeds growing tall, your work will be easier. Many of my hives are set in hillsides, which gives the hives great foundations, and good ventilation. Concrete makes that arrangement a natural.

Each day, you can make a new hive body and bottom board the way I described above. Just fill your molds again and leave them overnight. It takes just a few minutes each day, but it's worth it. Every week, you'll have five or six more hives. They always look new without a spot of rot on any of them. You can stack your wood hive bodies on top with as many supers as you want without fearing a smashed bottom board or a closed entrance. BC

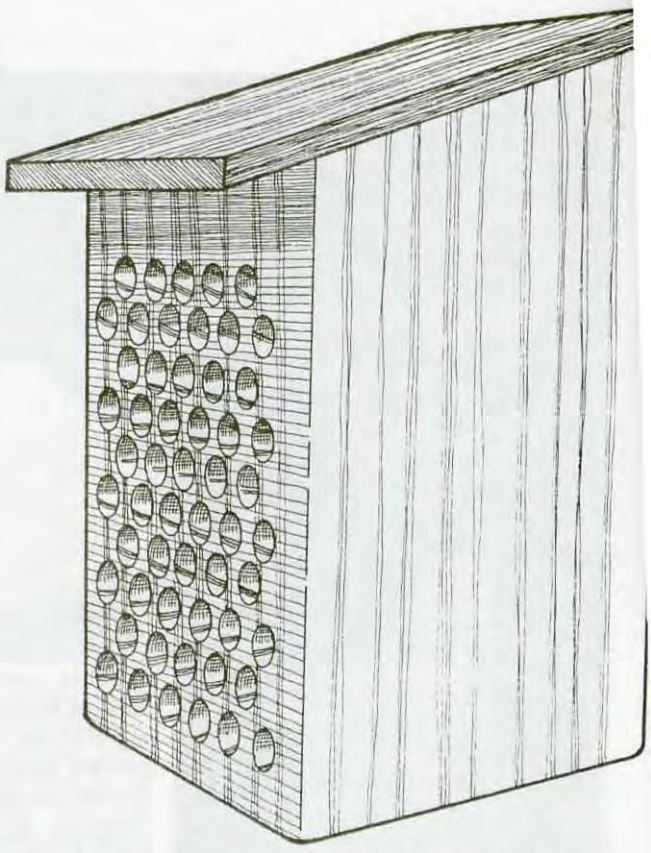
Steve Tuttle raises bees, and lays concrete near his home in Woodland, WA.





ORCHARD MASON BEES

brad gill



Leaning with my back against the barn wall, I gaze off into a typical, overcast Pacific Northwest sky. Like magic, she appears out of nowhere. With a low humming sound, she flies in a straight line and lands on the edge of a hole she has found in the wood block above my head. I have a few seconds to catch a glimpse of this fat, fuzzy, midnight-blue insect about two-thirds the size of one of my honey bees. As she slips into her protected nest, I can see the thick coat of yellow pollen dust she is wearing on her underbelly. I wonder what she is doing in there, and just how did she find this old piece of scrap wood, anyhow?

She is one of 3,500 known species of wild bees that inhabit North America and one of approximately 30,000 known species of the world's solitary bees. Scientists have named her *Osmia lignaria*, but I know her as the Orchard Mason bee, a benevolent, non-aggressive insect; a powerful little pollinator of almond, apple, cherry, pear and other early blooming crops.

These bees are so docile I don't need to wear any type of protective equipment when I am around them. I have never been stung, yet the female is capable of giving a mild sting and will if she is pinched or caught under clothing.

The feeling I have as I wait for her to reappear from her den reminds me of the time when I built a few small birdhouses for my wife, Judy. How the birds ever found those little cedar boxes is still a mystery to me, but they raised a noisy little family in each one of them.

A conversation with Dr. Philip

Continued on Next Page

An ideal place for nesting blocks, under the protection of a shed's overhang.

On top of a post isn't perfect but will do in a pinch.

Several shapes and sizes of nesting blocks.

ORCHARD BEES ... Cont. From Pg. 291

Torchio comes to mind. "If you're looking at the Orchard Mason bee for a potential commercial pollinator, you are looking in the right direction," he told me during a brief phone visit. Torchio, an entomologist at Utah State University, USDA-ARS Bee Biology Laboratory, has studied the Orchard Mason bee extensively and has shown, among other things, that maximum pollination in a commercial apple orchard can be achieved with as few as 250 female Orchard Masons per acre. Almonds require about 300 females per acre. In one of his studies, he used Orchard Masons to pollinate an isolated apple orchard in Utah. His data showed that fruit yield was increased by 53 percent in the two years they were used as the only pollinators in the orchard.

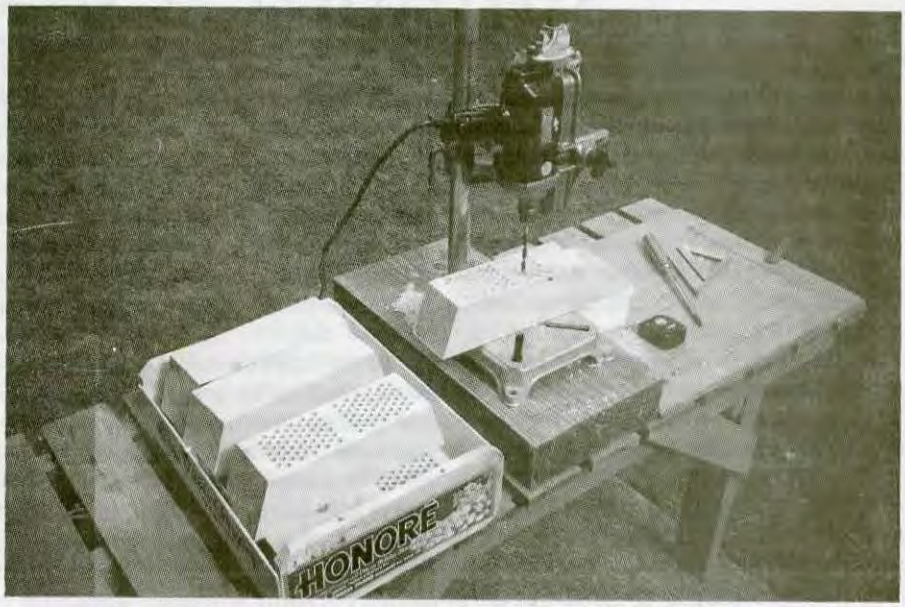
My daydream is interrupted when I see her peek out at the sky. She doesn't seem to notice me, and with great determination, in the manner of one who has an essential purpose, she immediately takes to the air and is gone.

Orchard Mason bees are indigenous to most areas of the United States and Canada and are commonly found in wooded areas or even around homes in cities and towns. Don't be surprised if you find them on the early spring flowers in your own back yard.

My first attempt at attracting Orchard Masons was a fascinating adventure, full of surprises. I made up six nesting blocks, each having 24 nest holes, and located them in different habitat settings near my home in an attempt to discover where the bees were living. Perhaps it is not accurate to call it a miracle, but it is difficult to describe my feeling of wonderment when I found at least four or five filled nest holes in each one of them! One nesting block fastened to the side of a tool shed near an extensive flower garden was almost completely filled by the end of April. I attached a second block next to it, and the bees filled half of the holes in that one by the end of May.

Pine, fir and hemlock all work well for building nesting blocks. Make sure the wood you use is very dry so that the holes cut cleanly and the wood doesn't crack. Using a drill press, drill a grid pattern of 3-inch to 3 1/4-inch deep holes, being careful not to drill through the back side of the 4" x 4" or 6" x 6" six or eight-inch long block. Proceed slowly and back the drill out often to remove cut material. Check to make sure each hole is very smooth and that no wood chips are left behind.

Orchard Masons will accept smaller or larger diameter holes; however, 5/16" (7 mm) has been shown to be the ideal size. A higher number of female offspring will be obtained when nesting blocks with 5/16" diameter holes are used. The holes can be placed in a symmetrical pattern with centers spaced 3/4" x 3/4"



The author's setup for making blocks.

or 1/2" x1/2". A high-density pattern is a more efficient use of material, but actually, if you prefer to place the holes randomly, the bees will gratefully accept them, too. An angle cut on one end of the block with the addition of a simple shed-type roof will protect the nest from rain and prevent moisture from seeping into the end grain. A piece of old cedar shake works well for this – see the drawing.

The wall of a house or outbuilding that has a protective roof overhang is an ideal location for a nesting block. Don't worry; these insects are not destructive and won't excavate holes in your home. Position the block at eye level or above, facing south or east, in a place that receives early-morning sun. Fasten the block securely with screws, as the developing larvae are fragile and cannot withstand jarring or excessive vibration. I like to get my blocks up by the first of March. In the Pacific Northwest, the nesting season runs from about mid-March to the first week of June.

When a female Orchard Mason bee finds a nesting block, she begins by selecting one of the holes for her nest, and then, she hauls in several little balls of wet mud that are placed against the very bottom of the hole. Once her "masonry" wall is complete, she brings in 15 to 20 loads of pollen and nectar, building a mound directly against the mud wall. She then lays a male or female egg, pressing it into the pollen/nectar food provision. A new mud wall is built to seal off this cell. The process is repeated again and again, each new cell being built onto the end of the last one. Finally, reaching the outside of the nest hole, she caps the top with a thick mud plug. During her short life, a female will complete approximately 35 nest cells.

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In our rainy environment, the bees easily locate wet soil, but in arid climates it may be necessary to provide them with a source of mud. This can be accomplished by digging a shallow hole and lining it with a sheet of plastic. A mound of dirt is placed on the plastic, and water is added periodically – or a drip irrigation device can be used. An ideal solution would be to locate nesting blocks within a few hundred feet of a natural water source, like a pond or stream.

A three-inch deep nest hole will contain four to six cells. The egg in each cell transforms into the larval stage and feeds on the food provision it is attached to. During the next month, it will increase dramatically in size and then slowly weave a cocoon around itself. The transformation continues from larva to pupa and finally, to a complete imago, or adult bee, by early September. At this stage, the nest is no longer considered to be fragile and will withstand normal handling.

Before the onset of winter, I move my nesting blocks into an unheated shed to keep them dry and protected from the direct effects of harsh weather. My new colonies sleep there nicely until the following spring. If you live in a climate where prolonged freezing is expected, some additional protection may be required. Don't winter your bees in a heated space as this will cause them to emerge prematurely.

By the first week in March, my blocks have been set out again and, at nature's signal, the bees begin to emerge. Mating takes place immediately, and the whole wonderful cycle repeats itself.

A population increase of up to five times can be realized each year simply by providing the required additional nesting space if adequate forage is available. Orchard Masons are gregarious nesters. This means that, like Purple Martins and swallows, they prefer to nest very close together, so place new nesting blocks right next to each other. In nature, holes created by wood-boring insects or birds provide minimal nesting space. This seems to be the main factor that limits wild populations. The nesting

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ORCHARD BEES ... Cont. From Pg. 293

blocks provide a way to develop a large population for commercial pollination use in two or three years.

Why is the Orchard Mason bee so exceptional as a pollinator of early-blooming crops? Being a native insect, she is better adapted to the local climate than the honey bee and she will fly in cool weather or even in a light rain. The Orchard Mason prefers to forage within a few hundred feet of her nest. A nesting block located in the immediate area of the target crop bloom will tend to keep her working where pollination is desired. The foraging behavior of the Orchard Mason may be described as nervous or erratic. She darts from blossom to blossom, and often from tree to tree, thus increasing the probability of achieving cross-pollination. Her anatomy gives her an advantage, too. There are no pollen baskets on her legs; however, there is a patch of stiff hairs on the underside of her abdomen called the scopa where she packs a thick layer of pollen granules. The pollen is brushed over the stigmas of each flower as she crawls down to reach the nectaries. Thus, Orchard Masons are said to pollinate a higher percentage of the blossoms they visit than do honey bees.

Orchard Mason beekeeping has already become popular among amateur orchardists in the Pacific Northwest. I wonder how long it will take before these bees achieve the same status as their immediate cousins, the Horned-Face bee (*Osmia Cornifrons*), native to Japan. Commercial apple pollination in Japan is accomplished almost exclusively by these bees. Their nesting behavior and requirements for propagation are similar to those of the Orchard Mason.

Before the Orchard Mason will prove itself to be a viable commercial pollinator, there are some obstacles to overcome and a few riddles yet to be solved. Their nests are delicate and require gentle handling during the larval development stage. If left permanently in an orchard, forage may become scarce once the fruit bloom has finished, which will cause the bees to leave in search of another food source. Of course, like other insects, they cannot tolerate many of the chemical sprays used for agricultural purposes. There are also some known natural predators and diseases that help balance wild populations of Orchard Masons. Will these become a problem if large domesticated populations are developed?

Fortunately, a great amount of research on this subject has been done by the scientific community. Certainly, some of the solutions will be found in their literature. Other answers will come only through practical experience.

I am optimistic. I see a great opportunity for beekeepers who want to explore new ways to supplement their incomes by offering a multi-species pollination service to growers. In my opinion, there is not a more qualified group of people than the beekeeping community with the experience and creativity needed to meet this challenge.

At the very least, I know that when each spring comes, I look forward to a new adventure with these wonderful, midnight-blue builders with mud. Graciously, they will allow me to observe their brief dance. Perhaps the time will go by too quickly, and again, I will be left only to ponder them for another year.

Fortunately I also have my honey bees to keep me company. I never tire of watching their landing boards come alive. By the first week in June, their boxes are almost bursting, and they seem eager to take on the task that awaits them in the long summer months ahead. BC

Brad Gill is a hobbyist beekeeper living near Rainier, WA with his wife, Judy. He teaches beekeeping classes and sells handmade nesting blocks and dormant Orchard Mason bee stock.

Honey Bees & Wildlife

I am a volunteer with the Shasta Wildlife Rescue and Rehabilitation, an independent, nonprofit California corporation dedicated to the rescue, rehabilitation and release back to the wild of orphaned, injured and ill native wildlife. Established at Redding, California, in 1979, Shasta Wildlife Rescue provides restorative care to over 100 different species of wildlife from all over Northern California. Each year, approximately 1,000 birds and mammals are cared for by a staff of volunteers. Licensed by both the U.S. Fish and Wildlife Service and the California Department of Fish and Game, Shasta Wildlife Rescue actively cooperates with both these and other local animal-control authorities. Injured and confiscated wildlife are routinely turned over to our organization for care.

Being a beekeeper I early on established a relationship with the world of wildlife through the pollination activities of honey bees. So important is pollination to wildlife food plants, particularly those dependent upon insect pollinators, that without this service, food shortages would severely limit the carrying capacity of our wildlife habitats.

Pollination and the subsequent fertilization and seed formation in plants is one of the most successful of nature's strategies. Not only man, but also the great majority of other animal consumers depend upon these plant functions for sustenance.

Narrowing down the story of pollination to the relationship between honey bees and wildlife brings to mind some specific instances of this dependency in our geographical region. Of course, what plants honey bees pollinate may vary considerably depending upon where you live. An intensively cultivated agricultural locality may require extensive honey bee pollination, but few of the plants in the area may contribute to the food supply of wildlife. Examples are almonds and fruit orchards in general. Exceptions are where certain seed crops are grown that become an important ingredient in commercial birdseed formulas. Examples of these are sunflowers and the mustards, each of which is more or less dependent on insect pollinators to produce a full crop of seed.

Aside from the pollination activity of honey bees in support of agricultural crop production, there exists a close relationship between honey bee activities and the non-cultivated plants. This is a direct relationship – bees gather nectar and pollen from the plants, and the plant's fruit and seeds are taken directly from the plant by wildlife. Here, some of nature's most interesting relationships exist, often unsuspected and largely ignored by both beekeepers and the public alike.

In our West Coast states, there exists a variety of vegetation zones due mainly to the existence of moun-

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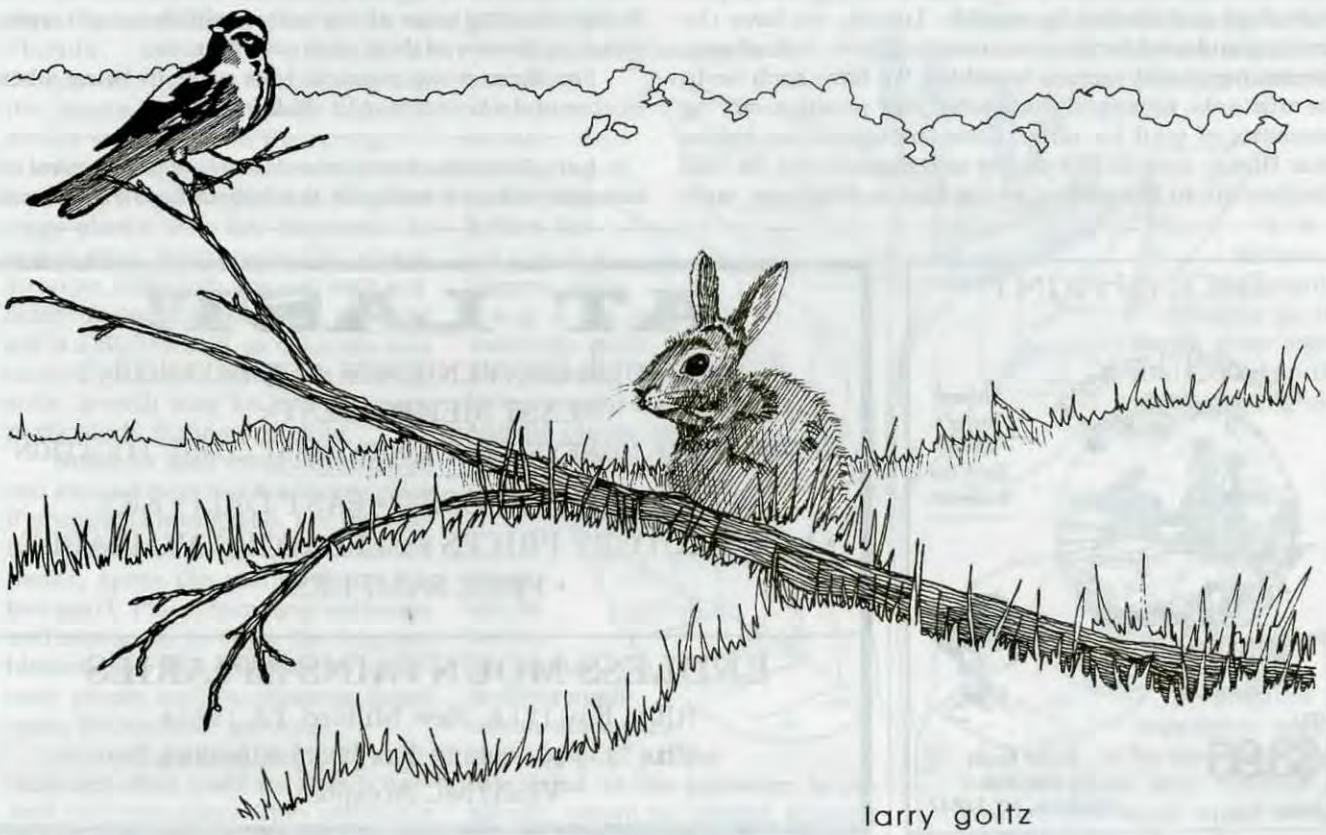


larry goltz

IN THE APIARY
by Doris E. Stebbins

Neat little houses, all in a row
Where winged little creatures come and go
So busy, busy, all day long
Humming their same, sweet happy song.

Then speeding away to a secret place,
Watching a spider spinning lace;
Then on where the flower holds a treat
Cool, dewey nectar and honey sweet.

The sun is their compass, its way is clear
As a wheel a mighty ship can steer –
But where they come from, and where they go,
Are not for you and I to know.

The sun is warm in the apiary
And God is watching each little bee;
The queen, the worker, the lazy drone,
And the wings that bring the honey home.

To the neat little houses, all in a row
With their wee folk moving to and fro
So busy, busy, all day long
Still humming their same, sweet happy song.

HONEY BEES & WILDLIFE ... Cont. From Pg. 295

tains, coastal plains and inter-mountain valleys. It is impossible to list all of the forbs, shrubs and trees that make up this complex mixture of plants, many of which provide food and shelter for wildlife. Locally, we have the fruiting and seed-forming manzanita, toyon, coffeeberry, chokecherry and various brambles. We have such herbs as mustards, cress and wild radish that produce varying amounts of seed for birds. Even the ubiquitous yellow star thistle contributes downy nesting material for wild finches late in the season. In the East and Midwest, such wildlife forage and shelter plants as willow, wild cherry, clovers, mustards, blackberry and many others contribute to the welfare of wildlife and have a close relationship with the pollination by honey bees. No matter that the bees are housed in hives or are feral colonies, their contribution is limited only by the numbers present.

Higher on the animal wildlife food chain than the herbivores (diets limited to plant forage) are the omnivores (diets may be of either plants or flesh) and the carnivores (diets of flesh only). By no means do omnivores (raccoon, fox, opossum and bear, for example) or carnivores (wild cat, cougar, wolf, for example) escape from dependence on biological reproduction in plants. Plant cellular activity is the source of energy that converts CO_2 and water into plant material that nourishes the prey of the carnivores. A surprising number of these plants require insect pollination to feed the prey on which carnivores live. Certain of the bird species that are not seed eaters or insectivores depend wholly or in part on the flesh of living prey, or carrion. Notable are the raptors – golden eagle, most hawks and falcons along with owls – that feed mainly on rodents and other small prey. Like the predator animals, birds of prey would be severely deprived of food should plant sources that nourish prey species become scarce. Here again, wildlife-insect pollinated plant relationships are evident in nature.

Beekeepers can take satisfaction in their significant contributions to the welfare of wildlife. At least partially as a result of the enormous increase in human population, wildlife species find fewer and fewer resources important to their survival. Many surviving species of wildlife are finding it difficult to cope with the pressures of human encroachment on their habitat. Competition from other, introduced species that find conditions to their liking is forcing some of our native wildlife out of territories long known as their exclusive domain.

For these many reasons, take pride in being a beekeeper and a benefactor to wildlife. BC

Larry Goltz teaches, lectures and writes about wildlife and bees and beekeeping from his home in Redding, CA. He is the former Editor of this magazine.

The Abelias

connie bright

Cultivated for their bell-shaped blossoms, abelias are reliable nectar and pollen sources for bees. From early summer until late fall, their arching branches are laden with white or pinkish-purple flowers. Like their honeysuckle relatives, these shrubs bear drooping clusters of blossoms, mostly terminal, impervious to rains, on the current season's growth. Showy pink or brown sepals lend interest after the blossoms fade.

Abelia, the common and Latin name, commemorates Clarke Abel, a member of an English mission to China in 1816. They tend to be deciduous in USDA hardiness zone 6, which extends to Southern Ohio and Pennsylvania, while further south, in zones 7-9, they are semi-evergreen to evergreen. Though hardiness may vary, most are adapted to zones 7-9. *A. x grandiflora* and its cultivars are hardy in zone 6, around -10° to 0°F.

Abelias are recommended for the Western and Northern areas of Florida, preferably north of Gainesville. In zone 6, cold may nip the plants to the ground, but new shoots will emerge in the spring.

Almost any exposure is suitable; however, heavy shade can result in leggy plants with few blossoms. In sunny sites, their bronze fall color is stronger. Although any soil with sufficient drainage is adequate, the ideal soil is a slightly acid, as chlorosis may occur if pH is rather high. In very dry soils, growth may be less vigorous, particularly during droughts.

Noted for their versatility, abelias can assume informal landscape roles if pruning is minimized. For foundation plants or as ground cover for banks, space the plants about two feet apart. Place them near walkways and entrances to enjoy the fragrant blooms. Use tall cultivars as specimen plants and incorporate dwarf types in Japanese gardens.

In small gardens, compact cultivars are often used for shrub borders and containers. They will thrive in the semi-shade of naturalistic, woodland gardens.

The refined foliage blends well with broadleaf evergreens such as camellias and hollies. Combine abelias with gray-foliage plants, such as Caryopteris, Buddleia and Ceratostigma.

For lovely hedges or screens, formal or informal, plant them about three feet apart.

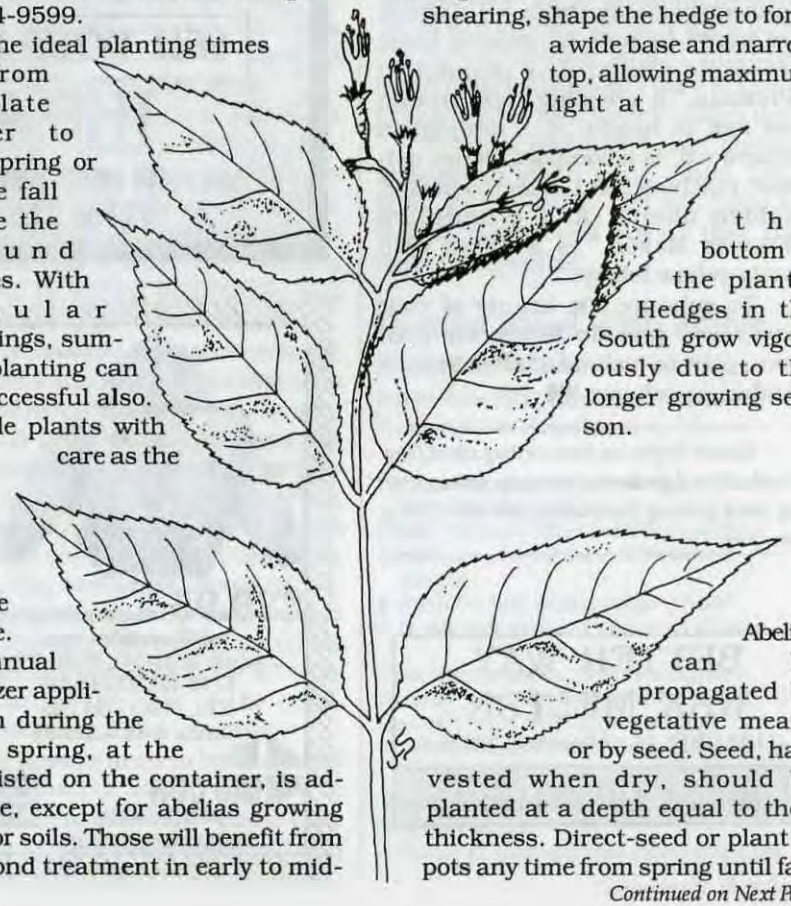
Abelias are sold as container plants, balled and burlapped, and bareroot, a method with a lower survival rate. If not available locally, they can be purchased from Forest Farm, Tetherow Rd., Williams, Oregon 97544-9599.

"To enhance the beauty of your home, and provide for your bees, try Abelias in your home landscape."

The ideal planting times are from very late winter to late spring or in the fall before the ground freezes. With regular waterings, summer planting can be successful also. Handle plants with care as the stems can be brittle. An annual fertilizer application during the early spring, at the rate listed on the container, is adequate, except for abelias growing in poor soils. Those will benefit from a second treatment in early to mid-summer.

Individual shrubs require a minimum of pruning. In the spring, before growth begins, remove winter-damaged stems. For overgrown abelias, two methods are available. Either cut all the stems to the ground at one time or remove only one-third of the old stems annually for several years.

For a formal hedge, regular pruning will produce compact growth. Despite periodic shearing, hedges are floriferous, provided trimming is done during the dormant season. When shearing, shape the hedge to form a wide base and narrow top, allowing maximum light at the bottom of the plants. Hedges in the South grow vigorously due to the longer growing season.



Abelias can be propagated by vegetative means or by seed. Seed, harvested when dry, should be planted at a depth equal to their thickness. Direct-seed or plant in pots any time from spring until fall.

Continued on Next Page

ABELIAS ... Cont. From Pg. 297

Layering is done by bending stems to the ground, pinning them in place for stability then heaping several inches of soil or mulch over them. Separate newly rooted plants from the mother plants with a pruning shears, then carefully dig the new plants to avoid disturbing the root balls.

Cuttings can be taken any time of year, even when foliage isn't present. Often, rooting hormones are used.

Seldom do abelias have serious problems as they are pest and disease-resistant. Leaf spots, mildew and root rot have occurred in rare instances.

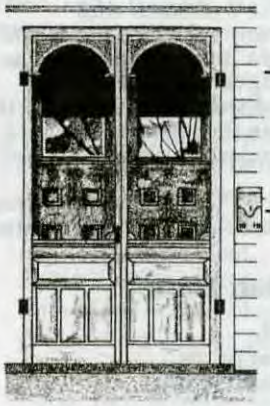
Though at least six species of abelias are in cultivation, only a few are commercially available. Beekeepers can possibly obtain cuttings of the rarer species from friends.

Pink abelia, A. "Edward Goucher," a hybrid, has very showy blooms. It can possibly grow to five feet in height.

One of the more common hybrids is glossy abelia, *A. x grandiflora*, three-six feet tall. Hardy in zone 6, its blooms are especially fragrant. There are several commonly grown cultivars of glossy abelia, all of which are hardy in zone 6. Among these are white abelia, *A. x grandiflora* "Prostata," a creeping type around one foot in height; *A. x grandiflora* "Sherwood" is a compact, dense cultivar, reaching 3-3 1/2 feet in height; Golden abelia, *A. x grandiflora* "Francis Mason," is 3-4' tall with lovely yellow foliage.

To enhance the beauty of your home and provide forage for your bees, plan to include abelias in your landscape scheme. BC

Connie Bright has been writing about flowers, plants and gardening for many years, covering many parts of the country. She now lives in New York.



HOME HARMONY

ann harman

In The Merry Month Of May

The month of May seems to have inspired many authors for many centuries to write about May flowers. We have all heard the little rhyme about April showers bringing May flowers. That was actually written back in the middle of the 1500s by Thomas Tusser who said: "Sweet April showers Do spring May flowers."

Someone named a ship "Mayflower" a fact which appears in every American history book. Children dance around a Maypole and sometimes get very tangled up indeed in their celebration of spring. May Day is celebrated in various ways in different countries. This month, we are going to celebrate by honoring those May flowers.

Now you may think we are going to pick a bouquet and use those flowers for decoration. Oh, no! We are going to eat those flowers and use honey, too! Well, you can go ahead and use some for decoration if you wish.

Here you might claim you have never eaten a flower and don't intend to. Have you eaten broccoli? That's the bud of a small yellow flower. More about that later. The artichoke – an immature flower. Herbal teas – assorted flowers (read the labels). Chinese cooking makes use of several kinds of flowers – dried day lily petals in hot and sour soup, for example. Stuffed squash blossoms appear on the menus in Mexican restaurants. Eating flowers is actually more common than you may think.

The best flowers for eating will come from your own garden. Then you know they are safe from pesticides and other contaminants. You will want to use only flowers that you know are safe for eating. Do not go out and munch on anything that is blooming. In general, choose flowers from the mint family and violets, dandelions, nasturtiums, squash, day lily, roses, pansies, violas, some herbs, calendulas and marigolds. You can find books that will tell you which flowers are edible and which are not.

Flowers for eating should be picked at their peak. Immature ones, wilted ones and those past their prime will usually not taste nearly as good as the ones at the height of bloom. The best time for picking is in the morning, just after the dew has evaporated. However, many flowers are fragile, so you will want to treat them carefully until time for preparation. If the flowers have stems of reasonable length, just put them in water. Those with short stems, such as orange blossoms, can be placed in a plastic bag and refrigerated.

Sample the petals of blossoms you choose to make certain you like their taste. Chive blossoms have an onion flavor. Calendula petals add a touch of bitterness. Lavender flowers have their own special taste. There's no point in eating something you don't like.

Flowers with long stamens heavy with pollen should have the stamens removed before preparation. In general, with flowers such as roses, tulips, calendulas and chrysanthemums, it is best to remove the petals and use only these. Remove petals just before use to prevent them from wilting. Use the whole flower of violets, runner beans, honeysuckle and clover. Flowers like roses, marigolds and chrysanthemums have a bitter white part at the base of the petal. Trim this part off before eating.

The flowers need to be clean and free from insects, so you will have to examine them carefully – insects are sometimes quite bitter and could ruin the taste of you dish. You can quickly rinse off many flowers just before preparing your recipe. However, test a blossom first to make certain it is indeed "washable." Water can discolor or collapse some fragile flowers.

Besides being used as a recipe ingredient, blossoms can also be frozen into ice cubes. Violets and violas look especially pretty in ice cubes. Fill the trays about one-third to one-half full and freeze. Lay the blossoms on top of these partial cubes, fill trays to usual depth and freeze. Blossoms, along with some leaves, can be used as decoration on salads, cakes, ice cream and casseroles. Some flowers, such as miniature roses, chives, mint and pansies can be grown in pots indoors so that you can have a few flowers to use during winter months. Some colorful blossoms used in cooking can cheer up a dreary winter day.

Are you convinced that flowers as food are worth a try? Good. Let's start with a salad. You will have to inform family and guests that the flowers are edible!

Garden Salad With Edible Flower Petals

from Ron Ottobre, chef, Mudd's Restaurant, San Ramon, CA

6 cups mixed greens, washed and torn into bite-sized pieces
Mudd's Honey Mustard Vinaigrette
4 tablespoons mixed edible flower petals
6 fresh button mushrooms, sliced
4 teaspoons grated Parmesan cheese

Toss mixed greens with vinaigrette. Arrange greens on individual plates. Garnish each with flower petals, mushroom slices and Parmesan cheese.

Mudd's Honey Mustard Vinaigrette:
1/2 cup honey
1/8 cup (2 tablespoons) Dijon mustard

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HOME ... Cont. From Pg. 299

1/8 cup (2 tablespoons) whole grain mustard
1/2 cup sherry vinegar
juice of a lemon
1 egg yolk
1 tablespoon thyme, chopped
1-1/2 cups safflower oil
1 cup olive oil

Combine first seven ingredients in a blender or food processor. Gradually add oils. Season with salt and pepper to taste. Serves 6.

Edible Flowers
Cathy Wilkinson Barash

If you wish, you can use the following salad with the above dressing.

Good Thyme Salad

from Ellen Mendyka, Good Thyme Farm, Bethlehem, Connecticut

6 cups mixed greens – lettuces, baby spinach, chicory, arugula, etc.
3 tablespoons calendula petals
2 tablespoons garlic chive florets
24 nasturtium flowers
12 anise hyssop flower stalks
24 borage flowers

Toss greens together in a large bowl with a dressing. Place flowers and petals on top of greens in an artistic arrangement. Serves 6 to 8.

Edible Flowers
Cathy Wilkinson Barash

Broccoli lovers may wish to try this recipe. I have always advocated leaving some broccoli plants blossom for the benefit of honey bees, but this time I am asking that the plants share the blossoms with you. The blossoms have a gentle, spicy bite and are a nice addition to a salad.

Tangy Lettuce Carrot Salad

1 head of loose-leaf lettuce (bibb or Boston), torn into bite-sized pieces
10 baby carrots, thinly sliced
4 tablespoons olive oil
2 tablespoons chive vinegar
1 teaspoon honey
1 clove garlic, crushed
salt and pepper to taste
20 to 30 broccoli flowers, petals only

Toss lettuce and carrots in a bowl. Whisk together oil, vinegar, honey and garlic. Season with salt and pepper to taste. Pour the dressing on the salad and mix together with the flower petals. A nice contrast with the sweet carrots, buttery lettuce and tangy flowers. Serves 4.

Edible Flowers
Cathy Wilkinson Barash

Honey bees like locust flowers, and so might you. If you find locust flowers hard to reach, try elderberry flowers. Elderberries can be found growing wild in places that are safe for gathering flowers. Don't try roadsides – auto exhaust contamination can ruin flowers there.

My Own Locust or Elderberry Flower Fritters

12 clusters of flowers, elderberry or locust
1/4 cup cognac
1/4 cup honey
1 recipe batter (see below)

Marinate clusters of flowers for 1/2 hour in cognac and honey mix. Dip flower clusters in batter and deep fry in vegetable oil until golden brown. Arrange on folded napkin. Dust with confectioner's sugar. Serves 4

Batter for Fruit or Flower Fritters
1/2 pound flour
1/2 teaspoon salt
1/4 cup melted butter
1 can beer
2 egg whites, whisked to a froth

Put flour, salt and melted butter in a bowl and dilute gradually with beer and a little lukewarm water. When you're about ready to use the batter, mix in egg whites. Keep the batter thin; do not stir too much.

The Honey Cookbook
Juliette Elkon

Honey can be used with flowers to make some unusual and delicious preserves. Although this next recipe calls for fireweed blossoms, other blossoms could be substituted if fireweed is not available.

Wilderness Honey

18 fireweed blossoms
30 red clover blossoms
30 white clover blossoms
2 cups water
10 cups clover honey
1 teaspoon alum

Combine blossoms and water in a large pan and boil for 5 minutes until blossoms are soft. Allow the mixture to stand overnight. Return the pan to the stove and bring to a boil once again. Add honey and alum and simmer for 10 minutes. Strain the mixture through a fine-mesh strainer. Pour into sterilized jars and seal.

The Book of Honey
Claude Francis and Fernande Gontier

West Indian Honey Rose Jam

1/2 pound rose petals
4 cups light, mild honey

Wash and dry the rose petals. Pour 1/4 inch of honey into the bottom of a large earthenware jar. Place a layer of petals on top of the honey. Continue to alternate layers of honey and petals. Seal the jar tightly and place in the sunshine for one week. Serve on toast, bread or muffins. Makes 1 quart.

The Book of Honey
Claude Francis and Fernande Gontier

If you were a bit late gathering the rose petals and you have had the first frost of autumn, gather the rose hips and make some jam from them.

Rose Hip Jam

1 pound rose hips
1 cup water
1-1/2 cups honey

Simmer rose hips in water until fruit is tender. Rub through a sieve. Return to heat and add honey. Simmer until thick, stirring frequently. Spoon into hot, sterilized jars. Seal. Process in a boiling-water bath for 10 minutes. Makes 3 half-pints.

Putting It Up With Honey
Susan Geiskopf

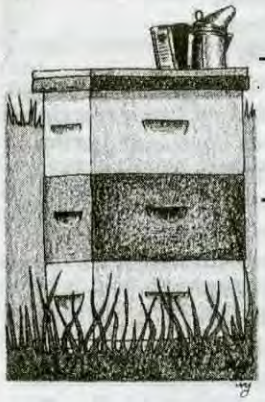
With these recipes, you can use your flower garden as well as your vegetable garden. Enjoy the merry month of May! BC

?Do You Know Answers ?

1. **True** The *Varroa* mite was first discovered and described on the Asian honey bee, *Apis cerana*, in Java in 1904. When the European honey bee was introduced into the far east, the mite moved from its native host.
2. **False** Only adult female *Varroa* mites feed on the blood of adult, pupal and larval honey bees. Male mites die after copulation with the female since their mouthparts are modified for sperm transfer only.
3. **False** The tracheal mite life cycle is completed within the respiratory tract of the adult honey bee except for brief migratory periods.
4. **False** The varroa mite has five stages: egg, six-legged larva, protonymph, deutonymph and adult. The tracheal mite has only four stages: egg, larva, resting nymphal stage, and adult.
5. **False** Buckfast honey bees were developed by Brother Adam at Buckfast Abbey in England and are reported to be resistant to tracheal mites.
6. **True** Female *Varroa* mites preferentially attack drone brood. Consequently drone brood can be used as a bait to attract females ready to lay eggs. This preference is probably related to the longer development time, which gives the mite longer to complete its life cycle. It is also possible that the mites prefer the cooler brood nest temperatures associated with drone brood.
7. **True** After worker bees emerge from their cells, female tracheal mites migrate into their tracheae by passing through the first thoracic spiracle, the only ones large enough to permit the passage of the mite.
8. **False** Apistan strips are approved for the control of *Varroa*, in colonies, package bees and queen mailing cages. The only acaricide registered for tracheal mite control is menthol.
9. **False** Tracheal mites reproduce throughout the year but *Varroa* mites are limited by the availability of brood. They begin reproduction with the onset of brood rearing and continue until brood rearing ceases.
10. **False** Without bees and brood, *Varroa* mites can survive no more than five days. They can live in a comb of sealed brood at 68° F up to 30 days. They may survive on dead brood for several weeks.
11. **True** Male tracheal mites are mature in 11 to 12 days and the females on the 14th or 15th day. The life cycle is about 8 to 9 days for the female and 6 to 7 days for the male *Varroa* mite.
12. **False** The ether-roll technique is used to check for *Varroa*. Dissection of adult bees is used to check for tracheal mites.
13. **True** Gravid female mites migrate preferentially to young bees less than 4 days old, and newly emerged bees, less than 24 hours old are especially attractive.
14. **False** The *Varroa* mite is considered to be the most serious pest of honey bees in the world. Tracheal mites have had a longer association with *Apis mellifera*, thus the host/parasite relationship appears to be stable except in North America because of its recent introduction.
15. **True** *Varroa* mites have been associated with the transmission of acute paralysis virus to adult bees.
16. C) Australia
17. A) Carniolan
18. E) Fluvalinate
19. B) 42 to 56
20. Tracheal mites lay their eggs in the adult honey bee's tracheae. *Varroa* mites lay their eggs in recently capped brood cells.
21. Differences between male and female *Varroa* mites are size, color and shape. The female *Varroa* is brown to reddish brown, 1.1 to 1.2 mm long and 1.5 to 1.6 mm wide and shaped like a tiny clam shell. The male mite is smaller (0.7 mm by 0.7 mm) and yellow to grayish white. It has a rounded shape, not flattened like a clam.
22. The female mite moves into brood cells containing young larvae just before the cell is capped. They engorge themselves on the royal jelly, then begin feeding on blood of the pupa.

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

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



BEE TALK

richard taylor

"There is one great advantage to being a comb honey beekeeper . . . and this is its simplicity."

Snow was flying today, but the countryside will be covered with dandelion bloom by the time anyone reads this. Few things are more inspiring to a beekeeper. The dandelions come just as a new honey-getting season begins, portending a fine crop. Not much of the nectar gets harvested because it is used by the bees for buildup, and it is the resulting huge population of bees that will gather the crop. Most people take dandelions for granted. Some even dig them up as noxious weeds. People unfamiliar with them react differently. Someone from Florida, seeing the golden dandelions for the first time, is apt to be overwhelmed. A gentleman from Japan, assigned by his company for a role in this country, carefully mowed around them. Someone once said that if the stars came out only one night each year, everyone would drop everything that night to go outside and look at them. What if dandelions bloomed only once in a decade? There would probably be festivals that year. But if you are a beekeeper, you never take dandelions for granted. Every spring you behold them with the same wonder and awe.

When I decided beginning with the January issue, to devote a few Bee Talk columns to comb honey basics, I had no idea how many it would take. Now I seem to be about ready to wind it all up, just in time the new season, and I hope some of my readers will be encouraged to try this challenging specialty. Much of what I have written about – swarm control, the need for strong colonies, requeening and so on - applies equally to harvesting strained honey. There is one great advantage to being a comb honey beekeeper which I don't think I've mentioned, however, and this is its simplicity. You do not need much equipment, such as extractor tanks, wax melters, bottling equipment and so on. Indeed, you do not even need a honey house unless you are producing comb honey on a large scale. All you need is a pocket knife and a deep freezer. You can do all the packaging, etc., in the kitchen without risking domestic discord by making everything sticky. What I have enjoyed most about comb honey beekeeping is that I can do things more or less at my leisure. I used to spend all day extracting honey – days at a time. I couldn't quit in the middle of things because it took a lot of work just getting set up to go. But now I pack and label the sections as I feel like it, stopping now and then for a cup of tea or whatever.

Let's move on to a word about assembling the supers and then harvesting and harvesting the supers. I use only eight frames per super, to get 32 sections, but you can use nine frames, as many do. With the eight-frame setup, you have a space at each side of the super, and I like that. Of course you need a piece of plywood, the same size as a frame, at each side. This makes for good ventilation, and I also feel that the sections at the sides and corners get filled up better this way Because the frames are shorter than extracting frames, there is of necessity a space at each end of the super.

You can build your own supers, but it is strongly recommended that you begin with a factory-made one, complete with its furniture, and use it as a pattern. Be sure you get a super the right *depth* for circular sections. *The standard comb honey super does not work* - it is 4 3/4" deep. The super for circular sections is 4 1/2" deep. If you try using the standard comb honey super, you will find the tops of the frames plastered with burr comb containing honey, which will create a sticky mess when you harvest it. It is important to mention this because some bee supply companies including one large one, sell the standard comb honey super as a circular section super, complete with circular section furniture.

I made a lot of my comb honey supers just by ripping standard hive bodies in two a table saw. You get supers without handholds that way, but that doesn't matter.

Putting supers together goes very fast. You can assemble a dozen easily in a couple of hours, even if the frames need a bit of scraping. The supers and frames will have been licked dry by the bees the previous fall, when they were all stacked outside for a few days.

Comb honey beekeepers usually think it very important to use the thinnest and whitest foundation they can get, and to be sure, some suppliers make it a point to offer only the very thinnest foundation for comb honey. But that really is not very important. The bees do literally *draw out* the foundation. They do not merely build upon it. So even foundation that is fairly heavy to begin with gets drawn out nice and thin, especially in warm weather. I have experimented and have never been able to detect any difference, in terms of waxiness, between comb honey made using very thin foundation and that for which a heavier foundation was used. It also does not

Continued on Next Page

matter if the foundation is not snowwhite.

Full sheets of foundation should be used whenever possible. The standard width for circular sections is 3 7/8" But if what you have on hand is wider than this, you can cut it down using a pair of shears. In fact, the bees will make perfectly good comb honey even if you do not use full sheets, but it probably takes them a little longer. Once when I ran low on foundation, I split the sheets into strips, using just two strips to stretch the foundation out. The result - perfectly nice comb honey.

Should you use bait sections? I used to, but I don't anymore. I could not see that they made any difference. Sometimes I have put on a whole super of bait sections, that is, a super filled with partially drawn sections which the bees had licked nice and dry the previous fall. The bees finished these up in nice shape, but I do not recommend it. Such unfinished sections have a ring of propolis around the edges of the foundation. You cannot see it after the section is filled, but it is still there. It is certainly best to start each season with fresh foundation. The rings from any unfinished sections can, however, be scraped and used again, which is another advantage of circular sections; you cannot do that with wooden sections.

Packing the comb honey is a simple and obvious, though somewhat tedious, procedure. The essential step here is to freeze the honey to about 0°F or below to destroy any wax worms. The wax worms that invade comb honey are tiny, but perfectly visible if left to develop. By giving the comb honey the deep freeze treatment, you destroy any that are there before they can be seen, even before they hatch from the invisibly small eggs.

My own deep freezer, used only for this purpose, is very small, but it holds 12 dozen sections. They need to be in the freezer only a couple of days. I put a thermometer in with them and wait until it reads about 4°F before taking the sections out. So, over the course of a few weeks, several hundred, or even two or three thousand sections can be dealt with, even with a very small freezer.

You have to put the sections in plastic bags before freezing them, then leave them in the bags for a couple of days after you remove them from the freezer so that moisture will not condense on the sections. This is no problem. I bag them 12 to a bag. You can use any plastic bags, even those you bring groceries home in.

Of course, there will be some unfinished sections, even in the best seasons, and these can be returned to the bees to finish up. Here it is important, when putting them back in the super, to have those most nearly filled in the outermost frames and in the corners. Frames in the center can contain just foundation. If you do not follow this pattern, you will get some sections still unfinished and others badly travel-stained.

I'll conclude my series next month with some suggestions for marketing comb honey. BC

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

Questions?

Left-Over Honey

Q One of my hives, consisting of a deep brood chamber and two shallow supers, has lots of honey in the supers. If the top super is still full of honey in the spring, what would be the best thing to do with it? Will the bees be slower to occupy new supers if I add them over one already full? Would it be a good idea to give that super of honey to a hive of newly established package bees?

Henry Yoder
Wallingford, KY

A It is an excellent idea to give a newly hived package of bees a super of honey if you have one, as they will then build up very quickly without requiring any feeding. If there is already honey on a hive on which you want to add another super, that honey will not act as a barrier to the bees storing honey in supers above it. You can also add new supers *under* a super of honey, but be careful about this if you are raising comb honey to make sure there is no brood in the super of honey. Comb honey gets travel stained very quickly if there is brood above it.

Moving Bees

Q What's the best way to move a small apiary? Does it have to be done at night?

A If you have only three or four hives, probably the best way is to staple them together, seal up all cracks and openings and cover the wide-open entrances with wire screen the night before, then move them at daybreak the next morning. You must be careful, however, not to leave the bees confined longer than that, especially in hot weather for there is a risk of their suffocating. If you have five or more hives, it is easier to staple the stories and bottom boards with special wide staples so the hives do not come apart at all. Load them onto a pickup, *with entrances open*, and cover them all with a large bee net, selecting a cool day when the bees are not flying to do this. In either case, they must be moved over a mile away, preferably at least two miles, for otherwise, many bees will return to the original location.

Making Nucs

Q How does one "split out a nuc" to use it for requeening a colony?

Susan C. Corkran
Chadds Ford, PA

A You can remove three combs of brood and bees from any hive and replace them with empty combs or foundation. Just make sure you do not also remove the queen. Place these combs in a three-frame nuc box or, if you do not have one, in a regular hive, filling the remaining space in the hive with empty combs or frames of foundation, then requeen this nuc (nucleus colony) with a new mated queen. Check four or five days later and, if you see eggs, or the queen strolling contentedly on a comb, put those three combs - bees, queen and all - into the colony you wish to requeen, being sure that you have, meanwhile, destroyed any queen or queen cells already there. If this is done properly, queen acceptance is almost certain.

Stopping Mites

Q Someone wrote that you can make your bees resistant to mites by greasing them with vegetable shortening. I used grease patties, but the bees did not take them up. I also used Apistan strips, but there are expensive. Is there another way?

Hagerstown, MD

A Tracheal mites are selective of their hosts and tend not to infest bees that have traces of oil or grease of any kind. There is strong evidence that the presence of an extender patty in a hive reduces tracheal mites. They do not affect *Varroa* mites, however, and as of now, Apistan strips are the only available means for combating these.

I thought Mr. Clayman's question probably has the widest general interest and so I cite that one, with a $5 bill to its author, as the "Question of The Month"

Requeening Techniques

Q I want to requeen my hives, and was told by a beekeeper, who seems to know what he may be talking about, just to drop the new queen into the hive. Since she is younger, she will have no difficulty killing, and thus replacing, the old queen. Does that really work? It would save a lot of time not having to look through all the frames for an unmarked queen.

Mike Clayman
Austinburg, OH

A A queen, no matter how young, simply dropped into a hive, is killed almost at once; not by the queen already there, but by the other bees. A new queen must gain some degree of acceptance by the other bees, and then there is a good chance that she will prevail. One way to do this is to put a ripe queen *cell* in the super, well above the brood chamber. The queen emerges and works her way down the hive, making friends as she goes along, then (hopefully) dispatches the old queen when they meet. A surer way is to get the queen accepted, *and laying*, in a nuc, then combine the whole nuc to the existing hive. But the best way of all is to remove the old queen and *then* combine the nuc with the hive. She is not hard to find in the spring once you've done it a few times.

Resistant Bees?

Q **You recently wrote that you didn't think there were queens resistant to *Varroa* available, yet there are advertisements of *Varroa*-resistant queens, and the Department of Agriculture has selected three bee breeders to initiate programs for mite-resistant queens. Shouldn't you re-evaluate your opinion?**

Lance T. Biechele
Princess Anne, MD

A I am aware that a certain degree of resistance to *Varroa* mites is claimed for certain strains of bees, yet I am advised that those who sell such queens recommend the continued use of Apistan strips. I am quite sure that no bees are offered for sale in this country that are resistant to *Varroa* in the sense that these bees never get *Varroa*, or even that they are immune to serious infections of *Varroa*. I also believe, however, that resistant strains will be developed in time - hopefully soon.

Dead Colony Cause

Q **Is there any good way of telling whether a winter-killed colony died of starvation, tracheal mites or *Varroa*?**

Duane Waid
Interlaken, NY

A Yes. If there are a lot of dead bees, many of them in the cells of the comb, little or no brood and no honey then the colony probably died of starvation. If there is still plenty of honey in the combs and very few dead bees, then it was probably tracheal mites. If there is scattered dead brood, and the combs look like AFB, withdraw some of the brood with a toothpick. If dead adult bees can be removed, more or less whole, and without the ropey stringing-out characteristic of AFB, then it was *Varroa*. This can be confirmed by finding a dead larva and seeing the specks of Varroa mite in it.

Editor's Note: Unfortunately, very often more than one problem exists in a hive that has died. Stress from cold or disease can lead to other, relatively minor problems becoming more troublesome, leading to the death of the colony. No longer is it as clear, and as easy to diagnose dead colonies.

What Color?

Q **What is the best kind and color of paint for hives? Should I use latex or oil-base paint?**

Kathy Snyder
Tiffin, OH

A Any outdoor paint will do, and it doesn't matter much what color you use. If you have a choice, choose a light color, especially if hives will be in the sun.

Hive Inspection

Q **How often should I inspect my hives?**

Jon Fox
Akron, Oh

A There is no need to ever remove and inspect combs except for some clear reason, such as part of a procedure for swarm control or to verify suspected disease or queenless condition. Do not go looking into hives just to see what's going on. I seldom have any need to inspect a colony after early July, when swarming season is over.

The response to our appeal for questions has been good. Keep them coming! Address questions to Dr. Richard Taylor, Box 352, Interlaken, NY 14847 enclosing a stamped envelope.

Answers!

Richard Taylor

Gleanings

MAY, 1995 • ALL THE NEWS THAT FITS

Dept. Of Commerce Rules

CHINESE HONEY IMPORTS TARGETED

The honey market, which had already been inching up in recent weeks took a dramatic jump following the DOC announcement, which was made public at noon on March 14. One producer reported concluding the sale of his 1994 crop of light amber honey immediately following the announcement at a price of five cents more than he had been offered a week earlier. The Mid-U.S. Honey Producers Association reports white honey moving at 55 cents per pound, as of late March.

The dumping duty will be applied to the Chinese exporter's invoice price, F.O.B. China – which approximates the customs value reported in U.S. import statistics. For December 1994, the weighted average customs value for bulk honey imports from China was 32.5 cents per pound. The addition of the average dumping duty would increase this price to 78.5 cents. To reach the selling price to U.S. honey packers, the cost of ocean freight and insurance, the normal tariff, Honey Board assessment, and importer's commissions, would have to be added to the F.O.B. price.

The Department of Commerce (DOC) rejected requests from both the Chinese exporters and the National Honey Packers and Dealers Association to delay the preliminary determination for 50 days. The U.S. beekeepers had mounted a campaign to have members of Congress ask Commerce Secretary Ron Brown not to grant an extension.

The case involves 28 Chinese exporting companies who responded to the DOC request for data on their shipments to the U.S. Previous to this, the largest number of foreign respondents in an antidumping case was 16.

To pare down the investigation and to allow it to return the preliminary determination without an extension of time, DOC fully analyzed the data from just four of the exporters, choosing the four which accounted for over 75% of the shipments to the United States during the period of investigation, May-October 1994. To these four companies, DOC has assigned individual estimated dumping duties, based on the preliminary analysis of each one, ranging from 127.52% to 157.16%.

Normally, DOC applies individual dumping rates to those exporters which cooperate by supplying data and are fully analyzed and best information available (BIA) rates to non-cooperating exporters. The BIA rate tends to be more punitive, since it is the higher of the highest margin claimed in the U.S. producers' petition or the highest calculated rate of any responding company. In this case, however, DOC noted that it would not be fair to assign a BIA rate to the other 24 companies, since they did furnish all requested data, and since the DOC lacked resources to analyze them. Therefore, a special single rate of 141.61% is being applied to those companies, a weighted average of the rates assigned to the four fully analyzed exporters.

The four companies receiving the individual rates and the 24 receiving the average rates are listed in the *Federal Register* notice. All other exporters must pay a duty of 157.16% – the highest rate of the companies which were fully analyzed.

The next step for DOC will be to send investigators to China to verify information the Chinese companies have filed in their questionnaires. Following the thorough investigation, DOC will issue a final determination of dumping duties. The DOC final is due Aug. 2, since the Chinese have requested a 60-day extension.

Now that DOC has found affirmatively for the petitioners, the U.S. International Trade Commission (ITC) will begin its final investigation. The ITC must find that honey imports from China are materially injuring, or threaten material injury to, the U.S. honey producers. In its preliminary decision, the ITC found threat of injury. The ITC final is due by 45 days after the DOC final, or Sept. 18. If the ITC again finds affirmatively for the petitioners, the final dumping order will be filed seven days later. If either the DOC or ITC final determinations are against the petitioners, the case ends at that point.

The ITC final determination will depend on questionnaires ITC will send to producers, packers, and importers. The producer organizations have been working to get a better response from their members on the questionnaires. For the preliminary questionnaire, the ITC sent about 400 to producers and producer-packers. Only 116 of them were returned to ITC, and just 75 were fully usable.

The ITC questionnaires will be sent out in April or May. Acknowledging that this will be the height of the bee season, there will be a longer period of time – about 30 days – to respond than was provided for the preliminary questionnaire.

From ABF

Honey Board Contacts

The National Honey Board consists of a diverse group of industry members: seven producers members, two importer/exporter members, two handlers, one cooperative member and one public member.

"Broad diversity in thoughts and opinions is crucial to the Board's success in representing the industry's needs," said Neil Miller, chairperson. Board members seek and welcome participation from constituents. Miller noted even when there are differences, Board members speak with a single voice on Board business.

"However, the industry should be aware that when Board members speak as individuals, or when representing their own business interests, they do not represent the Board – nor do they necessarily represent the views of the Board," said Miller.

If you would like to contact your Board representative, call the Board at 800-553-7162 for information.

HONEY MARKET BY FAX

Get Honey Market facts by FAX – fast, reliable information when you need it. The Amer. Beekeeping Fed. announces a new service for its members – a weekly report on the honey market. Every week, an up-to-date report on the U.S. honey market will be available in your office via fax.

The Honey Market Faxline Is:

- Available only to *commercial-level* members of the ABF ($150 or more dues).
- Available to subscribers only.
- Starting April 1 for a three-month trial period. The Market report's effectiveness will be evaluated in June and a determination will be made on continuing the service.
- $25. for trial period subscription (April-June 1995).
- Operating via fax only – *no* telephone calls.

Honey Market Faxline Operation:

- Cooperating subscribers will report their sales using a standard reporting form. The producer will supply information of the sale, including producer's name, buyer's name, quantity, grade, price, terms, etc. Sales reports will be limited to semi load minimums.
- The reported sales will be compiled and circulated to all subscribers via fax. The reported information will include:

  State shipped from. Quantity. Floral source. Color. Price.
  - Any unusual terms which would affect price.
- Schedule: Sales report due by noon Eastern Time on Mondays. Faxline report on subscribers' fax machines by start of business on Wednesdays. (Schedule, price, and other details subject to change, based on trial period experience.) First Faxline: April 5.
- Subscribers can list honey for sale at no extra cost on a space-available basis.

To subscribe contact the American Beekeeping Federation, P.O. Box 1038, Jesup, GA 31545, ph and FAX 912-427-8447.

Selling Honey Tips

ROADSIDE SELLING MADE EASY

1. A bold, bright sign is essential. The lettering must be large and clear enough to read from a passing vehicle. The minimum height for lettering is 36" Keep your message simple: "HONEY" or "HONEY FOR SALE."
2. Honey for sale must always be of top quality and absolutely pure.
3. Honey containers must be perfectly clean. Jars must never be sticky – nobody wants to carry a sticky container home. Sticky containers also attract bees and other insects.
4. Road-side purchasers can become regular customers. If they like your honey they will come back for more. Explain about your honey, which plants it is from, and how you harvest it from the bees. Make customers feel good about finding such an excellent supply of local honey! Emphasize the extra freshness of your product.
5. Offer both liquid and granulated honey for sale if you can. Explain to your customers the difference between these products. Replace any jars on display that are starting to granulate in an irregular way.
6. Improve your sales by offering different sizes and styles of packaging. But never compromise on quality of packaging. Since your customers will be travelling in a vehicle, maybe they would buy a larger container of honey? Try offering 'family size, 'economy' packs.
7. Pay attention to your display. Customers feel more encouraged to buy from a stack of attractive jars than from just a few tired-looking jars. Always arrange jars with the labels facing the front.
8. Link your honey with other products. Sell honey with, for example, a pack of lemons and give a recipe leaflet for honey lemonade. Other combinations of seasonal produce and recipes could be: honey & almonds, honey & oranges, honey & dates, honey & spices. Think a few weeks ahead. Plan promotions with the season and cultural or religious festivals.
9. Do not forget tourists. Local honey can be a popular gift item. Attractive labelling is essential here and must convey the local nature of the honey. Unusual, locally made containers filled with honey can attract a premium price. Perhaps you could sell pairs of jars inside a small, locally made wooden crate or basket?
10. If you are supplying a road-side market you must ensure that you keep it constantly stocked. This may mean that from time to time you have to buy honey from another local beekeeper. But never let the quality of your product or its presentation fall.

From: Bees For Development Troy, Monmouth, NY5 4AB, U.K.

Dan Glickman Became The 26th Secretary Of Agriculture On March 30. U.S. Secretaries of Agriculture

Name	Dates in Office		Home State
Norman J. Coleman	2/15/1889	3/6/1889	Missouri
Jeremiah McLain Rusk	3/6/1889	3/6/1893	Wisconsin
Julius Sterling Morton	3/7/1893	3/5/1897	Nebraska
James Wilson	3/6/1897	3/5/1913	Iowa
David F. Houston	3/6/1913	2/2/1920	Missouri
Edwin T. Meredith	2/2/1920	3/4/1921	Iowa
Henry C. Wallace	3/5/1921	10/25/1924	Iowa
Howard M. Gore	11/22/1924	3/4/1925	WV
William M. Jardine	3/5/1925	3/4/1929	Kansas
Arthur M. Hyde	3/6/1929	3/4/1933	Missouri
Henry A. Wallace	3/4/1933	9/4/1940	Iowa
Claude R. Wickard	9/5/1940	6/29/1945	Indiana
Clinton P. Anderson	6/30/1945	5/10/1948	New Mexico
Charles F. Brannan	6/2/1948	1/20/1953	Colorado
Ezra Taft Benson	1/21/1953	1/20/1961	Utah
Orville L. Freeman	1/21/1961	1/20/1969	Minnesota
Clifford M. Hardin	1/21/1969	11/17/1971	Nebraska
Earl Lauer Butz	12/2/1971	10/4/1976	Indiana
John A. Knebel	11/4/1976	1/20/1977	Virginia
Bob Bergland	1/23/1977	1/20/1981	Minnesota
John R. Block	1/23/1981	2/14/1986	Illinois
Richard E. Lyng	3/7/1986	1/21/1989	California
Clayton Yeutter	2/16/1989	3/1/1991	Nebraska
Edward R. Madigan	3/12/1991	1/20/1993	Illinois
Mike Espy	1/22/1993	12/31/1994	Mississippi

HONEY PLANTS AS CUT FLOWERS

Weeds you curse today could become the focal point of tomorrow's flower bouquets.

Ohio State University floriculturist James Metzger is in the infant stages of developing new varieties of flowers from weeds. These domesticated weeds could provide small-acreage farmers with an alternative crop and consumers with a wider variety of fresh-cut flowers.

Consumers demand variety, and they buy imported plants that could easily be grown in the United States. A white flower similar to the weed Queen Anne's lace is imported from Mexico as an alternative to baby's breath. The blue flower of the New England aster weed would also provide another color option for flower connoisseurs. Even the weedy goldenrod has market potential once domesticated.

Weeds have a lot of natural variation – that's how they manage to survive against people's efforts to destroy them. And that's why they make a good base for Metzger's experiments.

"To breed new plants, we first need to learn how to control their growth," Metzger says, "so we can grow plants that aren't so tall that they flop over."

This spring he will increase that natural variation by treating a variety of weeds with an agent that causes more mutations. That agent can be anything from x-rays to gamma light to special chemicals. The mutations affect specific genes that change flower color, height or shape. These mutations would eventually occur naturally – the agent just speeds up the process.

Using the results of that genetic manipulation, Metzger will be able to cross-breed related species to get even more traits and colors.

"The American flower industry can be very competitive by applying biotechnology such as this," Metzger says. These new flowers should be available to growers and consumers within the next five to 10 years.

Field-grown flowers could provide additional crops – and income – for vegetable and tobacco growers who are looking for alternatives.

A half-acre plot could produce profitable yields. Growers must have a definitive strategy, though, to tailor the crops to a specific site. Crop choices will depend heavily on soil type, soil pH, irrigation capabilities, pest problems and market demand.

USDA MONTHLY HONEY REPORT THREATENED

50 years of reporting prices, supply and demand for major Washington fresh fruit and vegetables and the U.S. Honey Market will end July 1, 1995 if the State discontinues their cooperative agreement with the USDA. The USDA's annual budget for Yakima and Seattle offices is $229,000.00 per year. Washington Department of Agriculture contributes $61,000.00 per year, or about 21% of the total cost.

Although the Washington Department of Agriculture recognizes the importance of Market News to the states' and the nation's food and agriculture industry, it's proposal (December 1994) to Governor Lowry was to totally cut all funding for this program as of July 1, 1995.

You might ask what good are these market reports? 1) Market reports are issued daily on all major fruit and vegetable commodities as to price, supply and demand. This is an unbiased up to date report and record of price information. A monthly honey report is also issued. 2) Reports can be certified by the Secretary of Agriculture as legal documents in court cases. PACA and attorneys also use these reports in law suits to settle disputes. 3) The F.O.B. prices are included in Market reports issued in 18 major terminal markets and 10-12 shipping point offices throughout the country and mailed or faxed to many foreign countries including Canada, Mexico, Saudi Arabia, New Zealand. This information is released to the national wire services and published in newspapers and Agriculture Magazines (including this one) throughout the world.

If you are concerned about losing the Market News Program, contact those listed below.

Jim Jesernig, Director
Washington State Dept. of Ag.
P.O. Box 42560
Olympia, WA 98504-2560

Robert Kenney, Director
USDA, F&V Division
Room 2077, South Building
P.O. Box 96456
Washington, DC 20090-6456

Lon S. Hatamiya, Administrator
USDA, Ag. Marketing Service
Room 3071 South Building
P.O. Box 96456
Washington, DC 29909-6456

TUCSON LAB ON WORLD WIDE WEB

Computer users can get information from the Carl Hayden Bee Research Center by accessing the Center's new Home Page on the Worldwide Web of the Internet. The Home page has information for a wide audience including beekeepers, elementary, high school, and college students, researchers, and others interested in bees and related subjects. The Home Page includes short biographies of the laboratory staff, their research interests, and accomplishments. There also are sections on pollination and other topics tailored to elementary and high school students. Insect photographs and recordings of sounds used by bees and other insects for communication can be downloaded. Software developed by scientists at the USDA-Agricultural Research Service facility is also available. One program simulates apple pollination. The address for the Home Page is: http://gears.tucson.ars.ag.gov./ or http://198.22.133.109/

Bees Can Fly

richard dalby

One of many fascinating facts about honey bees is that they can fly. Who among us has not, on a summer afternoon in the apiary, stolen a few moments away from the tasks at hand to watch bees streaming in and out the entrance of a strong hive? Who has not marveled at a bee's ability to be a creature of the air? Who has not, at some time, wished for the ability to fly?

Flight seems to have received less scholarly attention than other aspects of bee behavior. There are inherent difficulties in studying bees in flight. How do you track a bee on the wing with any precision as it flies from hive to field and back again? Nevertheless, some aspects of bee flight are well-documented. We know that young worker bees take their first "play flight" when they are around seven to 10 days of age. We know that a loaded worker bee flies at an average speed of 15 miles per hour. We know that outbound workers fly slightly slower than when returning to the hive. We know that drones fly at speeds from approximately six to 10 miles per hour. And we know that, if necessary, foraging bees will fly as far as eight miles from the hive, though one and one-half miles is much more typical.

Scientists tell us that insects were the first animals to evolve the ability to fly. With flight, insects gained a great advantage in finding food, escaping predators and becoming established over large geographic areas. Somewhere along the developmental line, certain insect species acquired the ability to fold their wings when not in flight. This was a very advantageous development. Imagine the spatial problems bees in a colony would have if their wings were sticking out like a dragon fly's, not folded neatly back over their abdomens. The situation would be similar to people in a crowded room trying to move about with their arms sticking out. Virtually all insect species known today have the honey bee's wing-folding abilityexcept members of the Dragon Fly Order.

The wings of developing bees do not become apparent until the pupal stage of metamorphosis. When the adult bee emerges from her cell (or his cell), she sports four wings, (two on each side of her body), a forewing and a smaller hind wing. In flight, the fore and hind wings achieve a unity of action, with tiny hooks on the leading edge of the hind wing coupling with corresponding hooks on the forewing. The actions of a bee's wings in flight are rather complex, involving up-and-down, forward-and-backward and rotary movements. The honey bee's flight muscles are contained in the thorax. A detailed exposition of the physical components of bee flight can be found in that great classic of bee literature, *Anatomy of the Honey Bee*, by R.E. Snodgrass.

The abilities of bees in flight are truly remarkable. Not only do they fly, they fly with great efficiency and accuracy to distant locations, then return to the precise location of their colony. Incoming worker bees may be carrying large loads of nectar, not to mention pollen, water or propolis. Workers can carry a nectar load of up to 70 milligrams (85 percent of their own weight), though typical loads are more in the range of 30 to 40 milligrams. Bees can fly forward, up, down, sideways, even, it seems, backwards. Their airborne agility is something no man-made aircraft can equal. They are truly masters of flight.