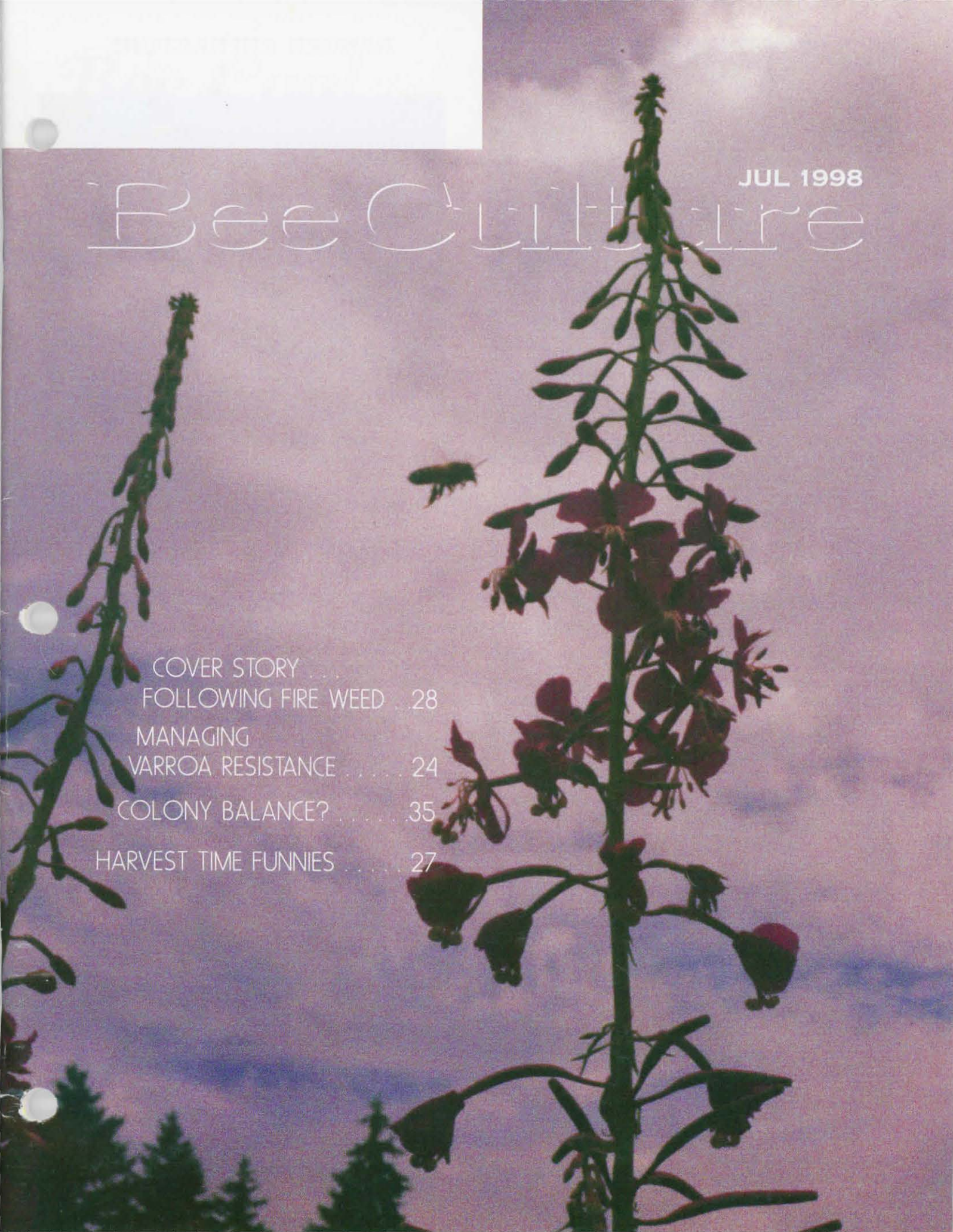
JUL 1998

Bee Culture



Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

JULY 1998 VOLUME 126 NUMBER 7

FEATURES

COVER

Fireweed and honey bees go well together, but you almost always have to go up to find it. But fireweed honey, say most who have ever tried it, is certainly worth the trip. Take this annual voyage with June Aploks, as she follows fireweed this month.

photo by June Aploks

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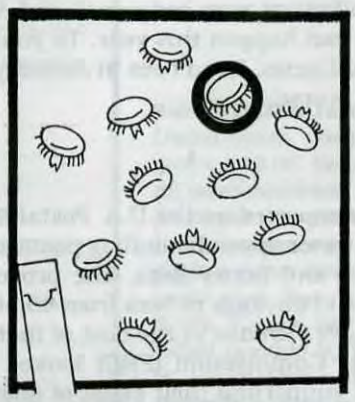

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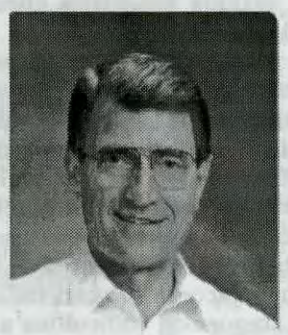
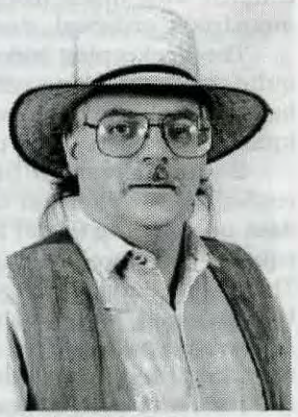


JOHN ROOT
Publisher



KIM FLOTTUM
Editor

INNER COVER

At the end of May this year, I took inventory of what was blooming in my neighborhood. I call it a neighborhood, but it is an easy drive I often take that more or less travels a nine-mile circle around my place. What I saw gave me pause. In fact, it rather scared me.

Blooming were plants that should not be blooming. Not blooming were plants, already spent, that should be proclaiming color and bloom and most of all, nectar and pollen. All told, I spotted nearly 40 different plants in bloom . . . and half of them shouldn't have been. Remember, this was the end of May in Northern Ohio, and roses and sumacs and poppies and yellow sweet clover(!), tulip poplar and . . . and thyme and white Dutch clover and locust and horseradish and chives . . .

Compressed into the manic month of May was the first half of Summer, spending its entire allotment of floral flash in a mere week or two and all a month or more early.

I last saw this phenomenon, but only in hindsight, a dozen or so years ago – my first year here in Ohio, and the last time the El Niño nastiness came and went. Then, as (probably) now, came a fast and manic Spring, then a long, desolate, desert Summer, without so much as a cupful of extra water, anywhere, all Summer long. Not until Labor Day did the rain finally arrive relieving Summer's parched period.

But worse occurred that year, and will perhaps again. And that, quite simply, was the fact that since Summer bloom came early and what should have been Summer was, for much of the country, only a dust bowl (an empty dust bowl) of available forage, all of Spring's generous offerings were consumed and August starvation was common. That can happen this year. To your bees.

A bad crop is bad news. Dead bees in January from something easily prevented is worse.

•

A while back we reported on the U.S. Postal Service's proposal to raise the rates to cover special handling postage on earthworms, chicks, crickets . . . and honey bees. The proposal was to raise rates on a three-pound package of bees from $5.40 to $17.25. That amounts to an $11.85 *increase* in the cost of that package.

The Postal Rate Commission (PRC) looked at the data the post office supplied supporting their claim of increased costs and, coupled with input from the various industries affected by this monstrous proposal, declined the increase.

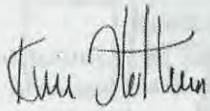
The beekeeping industry came out in force (almost, but not quite, too late), along with the poultry shippers and other groups in protesting the increase, supplying numbers to support a non-increase decision. They prevailed . . . fortunately, and for now.

But my contact at the PRC reminded me (us) that this is only round one. The reason the increase was denied was because the data used by the Postal Service to support the proposal was inadequate. Therefore, more (and better) statistics need to be collected. The Postal Service needs to have access to good data – information on costs, value, volume, frequency, difficulties and the like. And where will they get this information? One of two places. Either they'll hire a consultant, one with an expensive office over on K Street, who used to work for the P.O., so already knows it all; or, they'll get it from those who actually do the work, are in day-to-day contact with the situation, and have a vested interest in making sure the right information gets into the hands of the people who need it . . . and that can *only* be those in the package bee business.

This Fall and Winter package producers must make sure this happens. They must make certain that informed, articulate and well grounded members contact, then actually sit down with those who make the decisions in the postal service. That way, by next Spring some of the pieces will be in place to collect accurate, and fair, data on the cost of shipping packages. The Postal Service, for better or worse, is looking for the easy (and profitable) way out. Don't let them.

But if the package producers don't sit down and work things out with the postal service, then all those well intentioned articles printed in this magazine earlier this year on how to haul bees yourself will be even *more* important, because they'll be all there is between package producers, and package users.

So, until next time, keep your smoker lit, and your hive tool sharp.



El Niño Aftereffects; and Postal Aftershock

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New EMail

Bee Culture

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This is a good time of year to give your local paper, T.V. and radio news outlet a friendly reminder about stinging insects, and what to do about them. You should follow this up with a phone call (maybe a visit) and, as a representative of the local beekeeping group, pursue a story on what's important to your group at the time. This makes for good, free publicity.

News releases don't need to be fancy, but you should follow some simple guidelines. At the top of the page put 'News Release.' Directly beneath that put a one sentence summary of the release. For instance: 'Don't Get Stung On Your Next Picnic'; or, 'How To Avoid Wasps And Hornets."

Type the news release in double space, and if at all possible, keep it to a single sheet. You can send an additional second sheet, an information sheet, the editor can use as follow up, but probably won't.

Be sure to include a contact person's name and day and evening phone number and addresses.

And send it to absolutely every news outlet you can find – papers in every town, T.V. and radio and those free shoppers. And don't hesitate to send it more than once. The season is fairly long, and what doesn't fit this week may fit next week.

NEWS RELEASE

The _____ Beekeeper's Association reminds you that this is the time of year that hornets and yellow jackets become most abundant and most annoying.

_____, President of the group, says that these other pesky bees are often confused with honey bees and as a result, beekeepers take the blame. he adds that honey bees rarely cause problems around homes or picnic areas while hornets and yellow jackets actually seek these areas out in search of food for their young.

Below are some common sense guidelines to follow while outside this Summer, especially when having a get-together in the backyard, or a park or camp ground.

- Wear smooth, tan or white colored clothing.
- Avoid excess hair spray, perfume, cologne or sun tan lotion.
- Do not rely on insect repellents, they are not effective on ANY of these pests.
- When outside, keep sweets like candy, cakes, cookies and the like covered, and avoid spilling crumbs, if possible.
- Keep glasses or bottles holding beer, pop or juices to a minimum.
- Promptly dispose of empty containers, wrappers and fruit peelings as they attract pests. Keep your area neat. Keep trash recepticles covered if possible.
- Before choosing a picnic site, scout the area briefly to locate any obvious nests. Remember where to look, and what to look for.
- Check with nearby picnickers to see if problems exist, or if they are inviting pests.Avoid them if possible.
- Don't leave food unattended for long periods of time.
- Always, *always* double check a glass or bottle before drinking from it.
- Prepare foods, especially grilled meats in a timely manner, and don't leave that last hot dog on the grill.
- Clean up plates, dishes and glasses when finished and rinse off, dispose of, or keep covered.
- If one of these insects lands on you, *gently* and *slowly* brush it off. Do not panic, they are not looking for a fight, just for lunch. Swatting, waving and bouncing will only aggravate them. Slow, gentle movements will not be threatening. Foragers are not protecting a nest, and tend to be non-aggressive unless threatened when away from it.

_____ says that honey bees only seek sweet liquids, not other types of food. He(she) adds that honey bees are golden brown and fuzzy, while the other two pesky intruders are NOT fuzzy, but are shiny yellow and black.

Practice common sense when outside, keep your picnic areas tidy and keep your eyes open – you'll easily avoid problems this Summer.

KEEP IN TOUCH

Write: Editor, 623 W. Liberty St., Medina, OH 44256
FAX: 330-725-5624
EMAIL: KIM@AIROOT.COM

MAILBOX

Thumbs Up!

I appreciate the article "Coming To A Field Near You." I really wish this was one of your select online articles because there are a number of non-beekeepers that I would send the URL. I had no idea that transgenic plants were in such widespread commercial use. Thanks for the good work.

Chris Cowan
Rowlett, TX

•

Pleased With *Bee Culture*

I enclose a check for a two-year subscription to *Gleanings*.

I appreciate and thank you for your reduction of rates for members of a bee association – very generous, I think in these dog-eat-dog days of "downsizing" etc.

I had let my subscription to *Gleanings* lapse a few years ago, (I used to subscribe to every bee magazine), however I have been very *pleasantly surprised* at what I've received from you, and very much look forward to each issue.

I am a medium sized (300 – 400 colonies) beekeeper in Northern Vermont.

I know you have many sorts of people to please, but I especially appreciate articles on equipment, management of bees, and so on, that are pertinent to the medium-sized producer/packer. Especially, I like it when there is a real quality *in-depth practicality* to the writing. I know that this is hard to come by, but it is worth the effort.

I think you're doing a good job.

I'm doing a little investigation of plastic foundation, so a little more on people's experiences using that would be good. Will the bee rebuild it using this same plastic base? What experiences or luck have others had with it? How widespread is its use?

I'm very interested in any developments in the search of bees resistant to our mites. Also articles related to the most effective, new ways of treatment that may be developed to counter the mites, such as formic acid, etc.

This whole question of honey standards, use of terms, such as "raw honey" etc. is something that my customers often ask me about.

I know we will (may?) soon have standards for "organic" honey, which I personally find a bit perplexing, but some of my customers are sure to ask me about it (and, in fact, it is already for sale in some of their suppliers' catalogs.

I would like a good article on the easiest, most effective ways that people have come up with to get *crystallized honey out of barrels*. (I've just started using more barrels – I'm not sure *my* way of dealing with this is the best.)

I love people's accounts of their own experiments, or innovative new ways to save time, etc. but, if possible, I like them to try to approach a thoughtful and scientific-like manner rather than an anecdotal way about things.

Thanks again for your good work.

Franklin Heyburn
Waterville, VT

•

More Fun Stories?

My wife and I had a great laugh over the story "Missing" in Bottom Board, March '98. Could we have more stories like this one? As we say "Down Under," God on ya mate, it was a good laugh.

On the Internet do you know where I can obtain clip art on beekeeping?

Many thanks for a great beekeeping magazine.

David Kinnel
Queensland, Australia

•

Still Enjoys *BC*

A few years back I started with two hives, a whole bunch of enthusiasm, and a *Bee Culture* subscription. Today it's a flat bed truck, a Bobcat, lots of hives, but I still look forward to my *Bee Culture*. Thanks for offering an informative and enjoyable resource.

Terry Neiman

Check Out McGregor's Book

Kim Flottum, The "*Bee Culture* Page," and the USDA Bee Lab in Tucson for sure earns my highest "4 bee" rating for adding Sam McGregor's *Handbook of Pollination* and have earned the time beekeepers and the public spend in checking out this book and the respect of all beekeepers as well as my own envy for not doing it first.

This is the "bible" on honey bee pollination . . . check it out: http//www.airoot.com/beeculture/book/index.html, or gears.tucson.ars.ag.gov

Check it out and use it . . . you would never guess what revisions to this book were made because of my suggestions and I will never tell. But I got a bound signed copy of the original book for my efforts.

Some of the information is dated, mostly that of the exotic fruits and nuts which Sam knew from personal experience were visited by honey bees and other insects but was not sure of the benefits from these visits and since then some new information has been developed. I know of no errors in this book but then I had the pleasure with a few others of the pre-publication reading of it to look for errors.

I know that Sam is smiling big up there in the great bee pasture in the sky and he would be amazed at what we beekeepers have done with the Internet in such as short

Continued on Next Page

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time since he left us and would be proud to be part of it in this way. I really believe that this book on line will bring much public traffic to it and am going to ask Kim if I can connect to it from my own web pages and encourage other bee webmasters to do the same as it could be the most worthy public beekeeping document on the Internet as far as the future of beekeeping and the public support for it. And I hate the pollination side of beekeeping but know well its value to agriculture and the public perception of it.

Andy Nachbauer

•

One beehive is equivalent to about 300 man days for the pollination of cucumber fields.

This gem and a wealth of other information on pollination is available in McGregor's "Pollination Bible." Dr. McGregor's "Insect Pollination of Cultivated Crop Plants" is a standard reference work published by the USDA in 1976, and long out of print.

It has crop by crop summaries of all the pollination research to date. You can find major crops such as apples, oranges, watermelons and cucumbers, as well as more exotic ones like nutmeg, cherimoya, chestnuts, and lezpedeza.

Bee Culture magazine and the USDA Bee Lab in Tucson have provided the great service of making this work available on the Internet (let's hear a round of applause for Editor Kim Flottum!).

You can spend many an hour browsing to learn about pollination. You'll want to bookmark it, for future reference, because questions are always arising.

Just remember that when the book was published, there were high populations of feral honey bees, which are mostly gone now. So the recommendations need to be updated, and probably should be much greater in terms of hives per acre.

I used to think there would always be enough wild bees to supply gardeners and small acreage farmers. Today, I see lots of evidence of pollination failure in many gardens. So check out this work and learn about pollination.

I had hoped to complete this project myself, but balky OCR software and lack of time has prevented me from it. I expect to link to it on our page, but this event is too good to just do that quietly. I commend Editor Flottum and the USDA.

Check it out at:
http://airoot.com/beeculture/book/index.html, or at gears.tucson.ars.ag.gov

David Green
Hemingway, SC

Resistance Dilemma

May I add to the comments in the March Inner Cover and Zoecon's mailbox letter.

A seminar speaker in 1972 asserted pest control strategies that disrupt physiological mechanisms, such as blood clotting by Warfarin, cannot engender resistance. It may have been considered a cheap shot, but I asked if there might not be a rat somewhere with the unlikely mutation that would protect it? In the following months there were reports of Warfarin resistant rats in Germany, Liverpool, Vermont, and Wales. Mere exposure to pesticides or antibiotics does not produce resistance; it is the result of permanent genetic changes. Samples of bacteria frozen in 1942 were resistant to several antibiotics that did not exist then.

Since mutations are accidental, nondirected events, the likelihood of one occurring soon after developing a new pesticide or antibiotic is extremely unlikely; more probable it occurred decades or centuries earlier. We are walking museums of "useless" mutations that by chance are suddenly protective when threatened by a new organism or chemical.

Any new material we develop to destroy organisms is literally a license to select for individuals who have mutations that prevent that action. The Colorado potato beetle with "knockouts" of 15 insecticides since 1950 holds the record.

The rumors since 1993 of *Varroa jacobsoni* in Italy resistant to Fluvalinate (Apistan) are true, and now also in Florida and in colonies from these areas. Exposure to sublethal levels of miticide is not the cause: sublethal doses of DDT applied to 50 generations of fruit flies did not develop increased resistance to the insecticide. But when flies were exposed to increasing amounts of DDT for a year, only 5% were killed by the concentration of DDT that killed 95% of control flies.

The hope of finding *Apis mellifera* colonies tolerant of mites seems unrealistic if selection is done on colonies treated with miticides. The normal habitat of *Varroa* is in the nests of the small Asian bee *Apis cerana*, just as *mellifera* is the host for wingless flies called bee lice. Successful parasites evolve life styles that do not exterminate their hosts. In *cerana* colonies the mites lay their eggs only on drone larvae because worker development is shorter than that of the mites; in *mellifera* mites parasitize both drone and worker larvae. Unlike *mellifera*, the *cerana* workers actively groom each other to remove mites; biting off legs and puncturing the mite's bodies in the process.

The simplest solution may be to establish colonies of *cerana*. Their potential for honey production does not equal colonies of *mellifera* in prime high-yielding areas, but these gentle bees seem ideal for amateurs, side-liners, and their shorter foraging range makes them ideal for pollination. The review by P. Kevan of *The Asiatic Hive Bee* (1995), reviewed in *Bee Culture*, (July 1997) is a useful source of information. L.R. Verma at the International Centre for Integrated Mountain Development welcomes inquiries from persons interested in undertaking research to develop this species commercially.

The propensity for thoughtless introduction of foreign species has a long history of mischief, and *Varroa is an example with a twist. With the exception of cerana exported to West Germany in 1971 for research, the spread of Varroa* was in shipments of *mellifera* queens or

MAILBOX

colonies rumored to be especially productive: 1) Asia to eastern Europe; 2) Japan to South America; 3) South America to Florida; 4) Florida to Wisconsin for the first sighting of *Varroa* in the U.S. in 1987.

Half of the 35 million pounds of antibiotics produced in the U.S. is fed to farm animals to prevent disease, including Terramycin by 6% of hobbyist and 95% of commercial beekeepers to control American foulbrood. The British banned such use in 1969 to avoid selecting resistant strains of bacteria. The U.S. now has some scary bacteria immune to many antibiotics, and perhaps one immune to all of them.

Bacteria share genes, including groups resistant for 6 – 9 antibiotics, by exchanging cell structures called plasmids. I co-authored an article explaining this process and selection for resistance [*American Bee Journal* 111(2): 56-57 & 60 (1971)]. What is brand new is that plasmids have been used to transfer artificial genes into bacteria to destroy their resistance to antibiotics. . It will be many years before such technology is practical and with luck bees won't need the assistance. Unfortunately, resistance to Terramycin in American foulbrood has been confirmed recently.

Toge S.K. Johansson
East Berne, NY

Note: The reference in my April letter on cotton (page 11) was based on the following report:

Altieri, Miguel A. & Linda L. Schmidt. *Cover crops affect insect and spider populations in apple orchards*. California Agriculture January-February 1986, pp. 15-17.

Essential Oils

Your "Editor's Note" in the May '98 *Bee Culture* (p. 10) failed to acknowledge that a major attraction of the use of essential oils was that they could be used in the hive all year, unlike Apistan. This because the EPA had announced in the *Federal Register* that they were exempt from the requirements of the Federal Insecticide, Fungicide and Rodenticide Act (*American Bee Journal*), December '96, p. 859). I presume this is because it is not possible to contaminate a food product (honey) with a food product (essential oils). Besides, bees store honey in gallons while those oils are used in drops and the bees don't store the oils anyway.

Beekeepers taking advantage of Dr. Diana Sammataro's demonstration that tracheal mite populations could be suppressed below the level of economic damage simply by keeping Crisco patties in the hive all year (*ABJ* Apr. '96, p. 279) will find it requires almost no time or money to include essential oils in those patties (after Noel, *ABJ* Dec. '96, p. 858). By adding one or two tablespoons of honey to each patty, the bees are induced to consume them at a satisfactory rate (Libby, *ABJ* Apr. '98, p. 279).

That regimen will enable the beekeeper to defer using Apistan strips to complete the cleanup of *Varroa* until after the Fall surplus nectar flow has ended. Defer, too, until it is too late in the year for his robbing bees to reinfest his clean hive with mites after the Apistan strips have been removed.

I am eagerly awaiting validation of this procedure by bee scientists. Meanwhile, I'm delighted with its results.

Dan Hendricks
Mercer Island, WA

Lost Bees

We lost our bees this past Winter season apparently because of mites. I put in Apistan for six to seven weeks the middle of October.

The honey flow does not end until heavy frost kills the asters and time to take the honey off.

I have a question. Should the Apistan be applied sooner? They had Apistan in the previous Spring until the end of May.

Is honey after strips are removed safe to eat, or the frames not next to strips safe?

Herbert E. Ninson
Rock Creek, OH

Editor's Note: Varroa *populations need to be continuously monitored throughout the season. When you get five or more mite in an ether roll (200 adult bees from center of brood nest), you need to seriously think of treating, regardless of the time of year. The choice is: Honey or bees. Strips should be in the brood area, not honey supers.*

Black Honey

In reading an article in your November issue, "A Window to Honey Market" by Larry Goltz, he was telling about a beekeeper who brought to market in late Fall an almost black honey.

Well we in western Washington have a small surplus of this kind of "honey" which I also call blackberry. It comes in about the middle of September through October if weather stays warm. I've come to the conclusion that it's not the nectar but the juice of the Himalayan and Evergreen fruit, as I have seen many honey bees on these berries, especially when we have hot days, over 75°. It seems to increase the sugar content.

I call this honey, "Blackberry the Fruit". Almost everyone who tries it wants move, when it's fresh it has a good flavor but after it granulates it becomes kinda (for lack of a better word) rank.

This is just my own opinion, so take it for what its worth.

Jim Cowan
Aberdeen, WA

More On Foulbrood

I was quite surprised at the matter of fact way Richard Taylor answered the question of Harold Rogers on American Foulbrood. He could of referred him to books such as *ABC and XYZ* or *The Hive and the Honeybee*, the former published by A.I. Root Co. and the latter by Dadant and Sons. Periodicals such as *Bee Culture* and others have published articles on the disease.

I have been a beekeeper for some 65 years or so except for the time I was in the war. I spent some 5-1/2 years in college studying horticulture and bees. I currently hold an M.S. in pollination. I worked some 300 hives in pollination with my father and I

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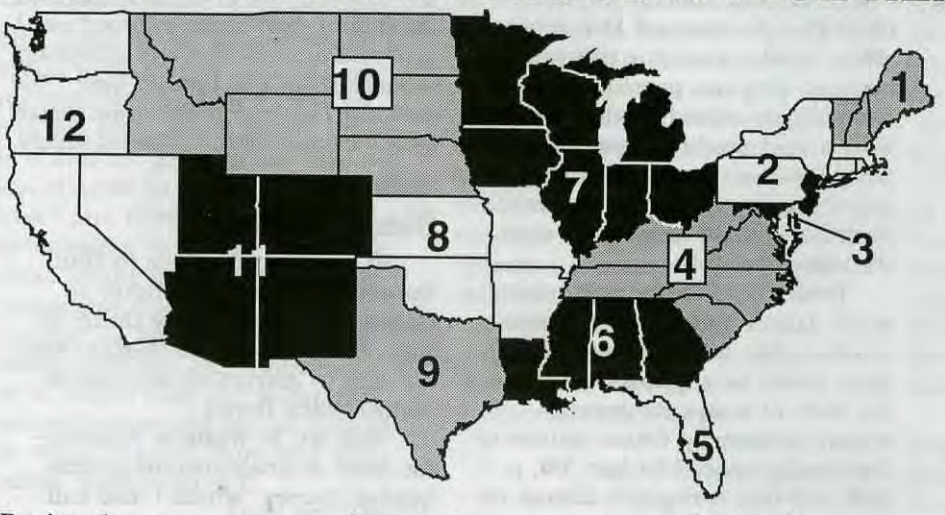
JULY – REGIONAL HONEY PRICE REPORT



Region 1

Prices steady, demand about right for the season, sellers' prices seem steady and an 'average' crop seems likely.

Region 2

Barrel and retail prices up a bit, wholesale seems steady. Demand steady to increasing a bit, and sellers' prices steady.

Region 3

Prices steady to a bit down, especially in larger containers and bulk. Demand only steady as prices at retail bounce.

Region 4

Bulk prices up just a bit as new crop comes in, wholesale and retail still steady. Demand only steady, as are plans for sellers' prices.

Region 5

Prices steady but depressed, and demand only average. Sellers' prices heading down with buyers holding out for even lower prices.

Region 6

Prices lower across the board this month. Demand only average, to decreasing in some spots. Sellers' prices remain steady, for now.

Region 7

Prices up just a bit across the board, but not much. Demand steady to increasing barely, and sellers' prices steady.

Region 8

Bulk prices down, but wholesale and retail increasing. Demand strong, but steady, and sellers' prices increasing, but only a little.

Region 9

Prices still decreasing though the rate has slowed. Demand steady, at retail anyway, and sellers' prices only steady.

Region 10

Bulk prices down, but wholesale and retail up a bit. Demand steady, but weather too strange for words. Late crops are predicted to be great, early freeze?

Region 11

Prices down a bit, but demand still steady. Sellers' prices will remain steady, but probably drop some. Crop predictions difficult to make, yet.

Region 12

Prices down across the board, but not much since last month. Demand steady to increasing a tiny bit, and sellers' prices remain steady to decreasing.

	Reporting Regions												Summary		History	
	1	2	3	4	5	6	7	8	9	10	11	12			Last	Last
Extracted honey sold bulk to Packers or Processors													**Range**	**Avg.**	**Month**	**Yr.**
Wholesale Bulk																
60# Light	58.88	64.50	50.40	68.67	65.00	51.00	51.20	63.00	54.00	60.30	66.67	57.00	30.00-90.00	60.91	57.55	67.55
60# Amber	54.77	63.44	51.00	60.10	64.00	46.13	49.80	58.00	52.00	52.75	61.67	56.00	26.40-75.00	56.86	54.24	64.24
55 gal. Light	0.69	0.84	0.70	0.77	0.70	0.65	0.80	0.78	0.85	0.71	0.74	0.80	0.49-1.45	0.81	0.74	0.94
55 gal. Amber	0.66	0.77	0.69	0.72	0.69	0.60	0.76	0.70	0.80	0.68	0.68	0.77	0.42-1.45	0.77	0.71	0.91
Wholesale - Case Lots																
1/2# 24's	28.73	26.98	30.75	31.48	30.00	28.00	31.92	30.75	30.00	30.75	27.75	26.30	24.00-38.40	29.86	29.11	29.11
1# 24's	42.05	40.66	43.20	44.51	42.50	41.50	44.82	41.19	48.00	45.00	36.20	43.72	30.00-54.00	43.06	43.09	43.09
2# 12's	39.09	34.78	42.60	45.33	41.30	38.30	38.01	40.07	42.00	42.00	33.80	37.63	29.40-60.00	39.91	37.39	37.39
12 oz. Plas. 24's	34.26	30.42	40.80	38.77	40.50	35.40	33.58	34.74	36.00	39.60	31.80	34.96	20.91-46.80	35.15	35.44	35.44
5# 6's	39.97	37.36	48.00	45.83	50.00	41.04	37.56	41.50	45.00	37.50	34.78	36.38	30.00-60.00	41.08	**41.22**	**41.22**
Retail Honey Prices																
1/2#	1.86	1.85	2.83	2.17	1.75	1.63	1.96	1.85	2.50	2.83	2.55	1.74	1.25-3.25	1.90	1.76	1.76
12 oz. Plastic	2.22	2.47	2.25	2.22	2.32	2.16	2.16	2.30	2.75	2.33	2.30	2.10	1.61-3.10	2.26	2.22	2.22
1 lb. Glass	2.70	3.02	2.55	2.80	2.33	2.58	2.46	2.78	3.50	2.49	2.73	2.74	1.99-4.97	2.72	2.67	2.67
2 lb. Glass	4.45	4.55	4.50	4.96	4.45	4.48	4.15	4.71	4.45	4.67	4.73	4.32	3.50-6.00	4.54	4.42	4.42
3 lb. Glass	6.01	6.90	6.50	6.75	6.40	6.18	6.50	6.28	6.00	5.69	6.03	5.57	4.00-8.59	6.18	6.08	6.08
4 lb. Glass	6.79	7.23	6.68	8.25	6.68	6.53	6.43	7.83	7.00	6.68	6.68	6.00	5.25-10.50	7.30	7.74	7.74
5 lb. Glass	8.99	10.05	9.75	9.75	7.00	8.08	10.68	10.38	9.95	7.70	8.71	8.17	7.50-11.95	9.18	9.06	9.06
1# Cream	3.28	3.62	3.76	3.84	3.76	2.98	3.31	3.14	5.50	3.76	3.01	2.66	2.00-5.95	3.34	3.13	3.13
1# Comb	3.99	3.85	4.03	4.16	4.03	4.00	3.80	3.98	5.25	4.03	4.88	4.38	1.95-6.00	4.14	4.19	4.19
Round Plastic	3.55	3.22	3.50	3.81	3.89	4.50	3.24	3.73	3.00	3.89	2.75	4.08	2.00-6.00	3.66	3.86	3.86
Wax (Light)	2.58	3.09	2.38	1.63	1.70	2.44	3.25	2.48	2.10	3.36	2.08	2.34	1.00-6.50	2.59	1.81	3.04
Wax (Dark)	2.23	2.58	2.23	1.43	1.40	2.28	2.20	1.75	3.50	2.83	1.88	2.26	1.00-5.25	2.25	1.62	2.62
Poll. Fee/Col.	36.27	37.83	31.50	39.00	25.00	34.00	37.57	40.00	39.02	39.02	50.00	34.60	20.00-60.00	37.07	34.03	34.03

MAILBOX

currently work some hives just to keep in touch.

First let me say there is no cure for American Foulbrood. It has been the most serious disease affecting the beekeeping industry.

Since it was first reported by G.F. White, "The cause of American Foulbrood," USDA Circ. 94, 1907, many attempts have been made to irradicate the disease but none have been successful probably because of infected bees in the wild being an infection source.

We tried to save the bees by moving the hive off its stand placing a new hive in its place and shaking the bees out of the old hive destroying the frames of brood, wax, and honey by burning and burying them. The hive parts were salvaged by scorching the insides of the hive. Saving the bees did not work in most instances but the scorching of the hive parts did work when they were properly cleaned before hand. Today they can use irradiation where it is possible. State bee inspectors may be able to help the beekeeper there. Burning is also a 'control' but still not 100% effective. During the 1940s the sulpha drugs were developed. They were diluted in sugar syrup for the treatment of Foulbrood. It became considered a treatment and cure for the disease. We soon found this not to be true.

We continued on in the quest for a cure and found terramycin which was considered effective fed with sugar or as a sugar patty. This is not a cure but may be used as a control.

In the late 1980s early 1990s *Varroa* and tracheal mites took the center stage in that they wiped out and caused heavy loses to the nation's beekeepers. The one fact that we lose is that they also wiped out the wild bees, the nation's highest infection source for American Foulbrood. Squirrels, mice, etc. as well as wax moth will play a large roll in the control of the disease. It will not completely control it but every little bit helps.

Waldron W. Newell
Douglas, MA

Hive Tool Test?

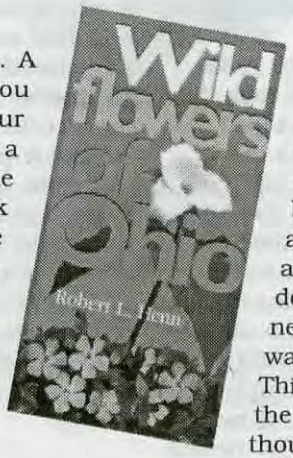
In Mr. Spear's article he refers to "giving the queen the hive tool test." I don't recall ever hearing of this before. Can either you or Mr. Spear please explain this procedure, and what it accomplishes.

Lawrence Welegala
Colorado

Editor's Note: *Interestingly, many people have asked that question, and it goes to show what happens when an editor begins to take some things for granted. The hive tool test is simply another way of removing the queen from a colony so a new one can be installed. A queen is squashed with the tool, then, if she lives, she passes, if not . . . Usually, certainly, beekeepers are not so graphic in describing this technique, nor so cruel. But it is a way to describe a task that for some is unpleasant, but for others simply efficient and effective colony management.*

Books, Books, Books

Wild Flowers of Ohio. Robert L. Henn. ISBN 0253333695. Paperback 4" x 8" (fits in your pocket). 287 color photos. 240 pgs. $14.95. Indiana University Press, 601 N. Morton St., Bloomington, IN 47404-3797. (812) 855.4203.



This is a field guide. A take-in-the-field-with-you field guide that fits in your back pocket (though it's a bit thick, it'll fit). Like the wetlands plants book mentioned on these pages the title leads you to think the geography will limit the content. But unless you live in Florida, the desert southwest or the Yukon, it will work in most parts of the U.S.

It is, as the book says user friendly. Flowers are arranged by color – pink, white, blue, etc. A color photo of a typical flower is at the top, along with its common name, scientific name and the plant family it is in. Below the photo is the description, comments, range in OH, habitat and bloom period.

Good, easy-to-use plant ID books aren't too hard to find. Book stores abound with them. However, most range in usefulness to beekeepers in that they are too specialized or aren't in color (keys), or don't give the information needed (bloom dates) or give way to much information. This book does it all in just the right amounts. And although it says its for Ohio, it fits, not only in your pocket, but in almost everybody's neighborhood.

Creepy, Crawly Cuisine: The Gourmet Guide To Edible Insects. Julieta Ramos Elorduy. ISBN-089281747X. Paperback 8" x 8". Color and B&W photos. 150 pgs. $16.00. Park St. Press, P.O. Box 388, Rochester, VT 05767. (800) 246-8648.

In a *Star Trek* movie, there's a scene where one of the good guys has been taken over by a tiny alien bug that lives in his head. You can't tell because he looks the same, talks the same, and pretty much acts the same. Except when he eats. Captain Kirk (or was it Picard?) is invited to dine with this alien person and doesn't suspect a problem until he takes the lid off his meal tray and discovers a huge bowl of moving, worm-like things that make distinct crunching sounds when consumed. This book is where that recipe came from.

Translated from Spanish, it has nearly 60 recipes for appetizers, salads, soups, main courses, sauces and desserts. Used are stink bugs, wasps, boll weevils, crickets, grasshoppers, ants and certainly honey bees, especially honey bee larvae. The author, for more than 20 years, has studied insects in the human diet, and is a world-class authority on their use, and usefulness.

The foreword was written, in glowing terms, by Gene DeFoliart, a professor friend from Wisconsin, and an authority himself. The book also has several appendices covering sources of insects, other books on the subject and a background on eating bugs and their nutritional value.

Now, where can I get some mealworms for that spaghetti sauce?

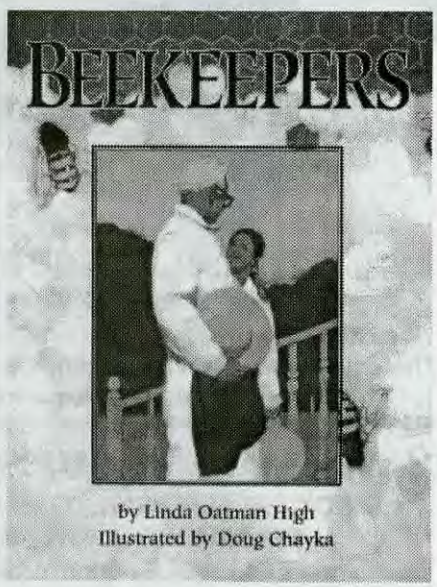
Beekeepers by Linda Oatman High. Illustrated by Doug Chayka. ISBN 156397486X. Hard cover 9" x 11½". All color on each of the 31 pgs. $14.95. Published by Boyds Mill Press, 815 Church St., Honesdale, PA 18431.

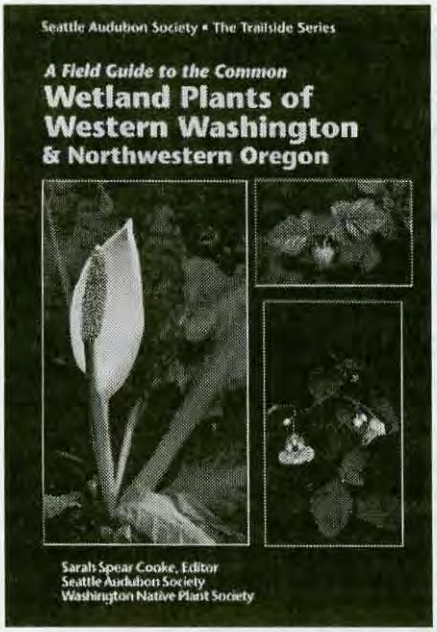
This is a book about a small girl and her beekeeper grandfather, who one morning go to examine his colonies, and while in the beeyard see, and then capture a swarm.

It is simply, but elegantly written, covering the activity in almost poetic prose. And it details in an easy style a moment of growth for the child, and a passing on of a lifestyle from the grandfather. It is one of the best beekeeping books, and stories for children I've seen in many years. Maybe the best.

But the art that accompanies each page, that shows what the author describes is what makes this book exceptional. Tools, equipment and beekeepers are correct, without being overly detailed. The words, and the art work well together.

If you want to share what you do with a child, I couldn't think of a better place to start.





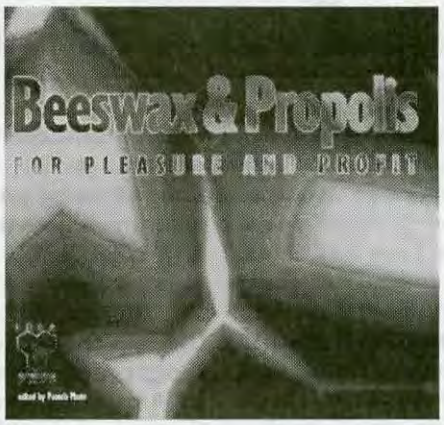
A Field Guide To The Common Wetland Plants of Western Washington and Northwestern Oregon. Sarah Spear Cooke, Editor. ISBN-0914516116. Paperback, 6" x 9", color and line drawing. 416 pgs. $24.95 + $2.75 P&H (+$2.15 tax for WA residents). Published by Seattle Audubon Society, 8050 35th Ave., N.E., Seattle, WA 98115. (206) 523-4483.

Although the title suggests that a very limited geographical area is covered by this work, many of the plants are found in many of the U.S. wetlands. Essentially, this book is a plant key, but the wealth of information accompanying each description is astounding. For instance, 11 willow shrubs are described, with detailed information on both male and female catkins (flowers), plus plant habit, twig and leaf description, habitat, range, bloom dates, similar species (I found this *very* useful), county maps where the plants can be found and clear, concise line drawings of the plants. Plus, there's a section for each on how the plant is used by humans – shelter, food and the like. Nearly 400 plants are detailed. Also included are several color photos, a reference section, glossary and index.

You probably won't find this in the neighborhood bookstore, but you can order it directly. If you're a plant person, this is a must. If you're a bee person, even more so.

Beeswax & Propolis, For Pleasure and Profit. Edited by Pamela Munn. ISBN 0860982343. Paperback 8" x 8". B&W photos. 33 pgs. (see below for price) Published by IBRA.

IBRA has, over the years, published many books. Some, maybe most, are universal in that anywhere moveable frame hives and standard extraction equipment is used, the information applies. But even so, there is always a distinct English flavor to the language, the style and content. This book is no exception.



The two chapters on beeswax are interesting, especially the first, which was written by a commercial processor. The other wax chapter is quaint, but nothing new, and marketing information is scarce.

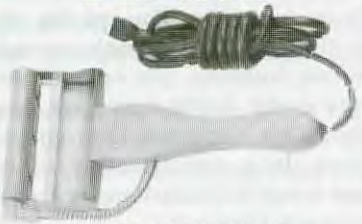
The propolis chapters are unique in that there is a fair bit of information on medicinal value and preparation, but marketing information is lacking.

Overall, this book is a good source of front end information, but short on 'now that I've made it, how do I sell it.' The title is misleading, but ignore that and you'll not be disappointed.

In an effort to get IBRA's books more noticed in the U.S., they make the following offer. You can get this book for $10 (surface post included). But, if you purchase their *Varroa* book ($10), plus their Bumblebee book ($15), plus this book, they'll send you their *Varroa* wall chart absolutely free. This is definitely a bargain.

Contact them at: IBRA, 18 N. Road, Cardiff CF1 3DY UK, FAX – 01222.665522, or email: ibra@cardiff.ac.uk.

And More Books



Roger Morse

Research Review

"Even though bees have a small brain, it has been demonstrated that they can remember, think and make reasonable decisions."

Wild (feral) colonies of honey bees in trees and the sides of buildings that were examined several years ago in upstate New York had about 17 percent drone comb. The presence of this amount of drone comb is apparently normal. Experiments conducted in England showed that colonies given more drone comb built significantly less new drone comb.

The paper I review here builds on our knowledge of drone comb building and then asks how bees regulate the quantity of drone comb they build. The question was answered in five experiments conducted in New York and Florida using colonies that contained about 23,000 worker bees each, which is near the average number found in feral colonies.

The first experiment was designed to confirm if colonies with drone-comb built less new drone comb than did those without drone comb. Test colonies had either no drone comb or were given two combs with drone size cells and six combs with worker cells. The results show that there is considerable variation between colonies, but colonies with drone comb build less new drone comb. This confirms that colonies adjust their construction of new drone comb in accordance with what is already present.

In the second experiment, half of the colonies were given drone comb as before, but the drone cells were separated from the rest of the hive by a single sheet of wire screen. Thus, the bees could not walk on the drone comb, but any odors or volatile chemicals that might make it different could pass through the screen and into the nest. The results showed that bees must be able to walk on the comb and have physical contact with it in order to know if it was present or not. There was no evidence that drone comb has any special odor that makes it different from worker comb.

The third experiment asked if the queen has any influence on drone comb building. This was tested by separating the drone comb from the rest of the hive and the queen with a queen excluder. In this way the workers could walk on the comb but the queen could not. The results showed that the regulation of drone comb building was not affected by the queen's having contact with the drone comb. In other words, the queen has no effect on or control over drone comb building.

The fourth experiment was conducted to see if the presence of drone brood in the drone comb made any difference. In this test, drone comb with brood was tested against drone comb that had never contained brood. The results showed the comb itself is an adequate source of cues and that brood is not necessary.

The final experiment involved combinations of 1, 3 and 4 of the above. The results indicate that drone brood may contribute to the inhibition of building further drone comb but that drone comb itself is all that is really needed.

The results of these tests are further support that neither the queen nor any small group of bees controls social order and especially comb building in honey bee colonies. Drone comb construction is regulated by decentralized control by the comb builders. It is pointed out that drone comb is built over a period of five or more months but drones are usually reared over a much shorter period of time. In his discussion, this researcher states that "spreading a decision process over several thousand workers may improve the reliability of the decisions made."

How do bees measure cell size?

This paper shows that bees can tell the difference between worker and drone comb, but it does not tell us how they do it. Several years ago it was shown that queens that had their front legs removed could not tell the difference between the worker and drone cells and did not lay the appropriate eggs in the right cell. It was concluded that queens use their front legs like a pair of calipers. Maybe workers do the same?

How are the comb building decisions coordinated?

Anything said here is pure speculation, but it is interesting to think about how honey bees make decisions. Even though bees have a small brain it has been demonstrated they can remember, think and make reasonable decisions. For example, "Bees have a well-established capacity to measure time intervals."

Part of the problem is that an individual bee cannot know everything; some bees may think there is too little drone comb while others may think there is too much. However, what apparently happens is that these average out and the bees come up with the right answer. In the experiments I review here the author reports there was always variation among the test colonies, but that is to be expected. BC

Reference:
Pratt, S.C. *Decentralized control of drone comb construction in honey bee colonies.* Behavioral Ecology & Sociobiology 42: 183-205. 1998.

?DO YOU KNOW?

Basic Bee Physiology & Anatomy

Clarence Collison
Mississippi State University

Even though individual honey bees cannot survive by themselves due to a high degree of specialization found within a colony, each bee must have all the basic life supporting processes found within living organisms. Understanding basic bee physiology and anatomy will not only help the beekeeper better understand the factors that affect colony development, and honey bee behavior but also the devastating effects of the various bee diseases, parasites and pesticides that are often encountered in beekeeping. These maladies directly effect the internal systems of the honey bee. Knowledge about basic bee biology is also important in determining the requirements and conditions needed for colony survival and what management manipulations are needed in order to have productive hives.

Please take a few minutes and answer the following questions to find out how well you understand bee anatomy and physiology.

The first nine 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. ___ As a worker honey bee ages it becomes more sensitive to colony disturbances
2. ___ Workers have a rudimentary, nonfunctional spermatheca.
3. ___ The natural life span of the queen is determined by the number of eggs she lays.
4. ___ Spiracles are involved in the exchange of oxygen, some carbon dioxide and water vapor.
5. ___ The honey bee thorax is composed of four segments.
6. ___ Honey bees have an open circulatory system.
7. ___ The tracheal system is responsible for supplying oxygen to each individual cell of the body.
8. ___ The central nervous system of the honey bee is composed of a brain and seven ganglia or nerve centers at various junctions throughout the body.
9. ___ The simple eyes (ocelli) analyze polarized light, thus permitting the bee to use the sun's position as a compass during flight.

Multiple Choice Question (1 point)

10. ___ The number of Malpighian tubes found within an adult honey bee is approximately:
    A. 100
    B. 50
    C. 120
    D. 80
    E. 30
11. What is the function of the pair of spermathecal glands? (1 point)
12. Name the three types of cells associated with the developing eggs within the queen's ovarioles. (3 points).

Please match the following body structures with the appropriate description.

A. Flagellum B. Labium C. Ostia D. Hamuli E. Valve Fold F. Coxa G. Tibia H. Scape I. Flabellum J. Labrum K. Ommatidium L. Corbiculum M. Femur N. Apodeme O. Arolium P. Basitarsus Q. Trochanter

13. ___ Long basal segment of the antennae.
14. ___ Upper lip
15. ___ Slit-like openings or valves which permit blood to enter the chambers of the heart from the pericardial cavity.
16. ___ Individual optical units containing a lens making up the compound eye.
17. ___ The pollen basket on the hind leg of the worker honey bee.
18. ___ The basal segment of the leg.
19. ___ An invagination of the body wall serving for the attachment of muscles.
20. ___ The first enlarged segment of the honey bee foot.
21. ___ A padlike structure between the claws of the foot of the bee, used in walking on smooth surfaces.
22. ___ The lobe of the apex of the tongue of the bee.
23. ___ A tongue-like structure which can close the passage between the vagina and the median oviduct of the queen.

ANSWERS ON PAGE 46

Mark Winston

Beekeeping Journals: The Good, The Bad, and the Ugly

"The challenge for an editor is to select a compelling mix of articles that educates and entertains, amuses yet informs."

I read. I not only read, but I read indiscriminately, and I read every time I can steal a few minutes or find a quiet place. Our washroom at home has a bookshelf next to the throne, and I have spent many a pensive moment browsing through magazines, joke books, clothing catalogs, old newspapers, *National Geographics* from 1989 (the one year we subscribed) and beekeeping newsletters. Fortunately, we have only one washroom at home, and the hard pounding on the door by my wife or daughter has kept me from being lost in there forever.

My intemperate reading addiction has given me an unusually broad perspective on the elitist question that obsesses all true-blue academic intellectuals: "What is literature?" I've taken the anti-snob approach; I value quality in any medium. A well-written catalog from L.L. Bean impresses me more than some of the poorly written classics we all were forced to read in school. Similarly, I revel in a good beekeeping read, and an engaging article in my local British Columbia beekeeping newsletter entertains me as much as the latest dense selection from the *Atlantic Monthly*.

Beekeeping journals and newsletters are a curious medium because the audience is so diverse. Beekeepers represent a wide range of educational backgrounds, from those who never finished high school through professors, medical doctors and lawyers. We speak in a range of accents, and I'm sure our reading tastes are all over the literary map, from heavy philosophical tracts through to scandal-rag tabloid newspapers. Some of us are commercial beekeepers, others keep a backyard hive; some have had bees in the family for many generations, others began beekeeping last week. Each of us wants something different: Some read for information about beekeeping, others seek news concerning bee politics; some want to read gossip about the people involved in our industry, while another segment of readers wants the latest research results. The challenge for an editor is to select a compelling mix of articles that educates and entertains, amuses yet informs.

We are fortunate in our industry to have a number of fine beekeeping journals, providing choice and a refreshing range of information and style. Generally, the newsletters, newspapers and magazines that are addressed to beekeepers do an excellent job of providing good writing in an entertaining array of articles. In contrast, the journals that focus on bee research usually do an abysmal job, presenting densely written tracts on obscure subjects that even we researchers find heavy slogging.

Some of the best reads in the beekeeping journalism community are the newsletters put out by our organizations. My particular favorites here in Canada are the *Bee Scene* and *Hive Lights*, the former being the newsletter for the British Columbia (B.C.) Honey Producers Association, and the latter the organ of the Canadian Honey Council. Both of these fine magazines are edited by the same woman, Fran Kay, who has made a mini-career out of editing agricultural newsletters but has a special fondness for bees. What particularly impresses me about these two publications are the range of authors, topics and subjects that Fran selects and the delightful wealth of opinions that grace the pages of these magazines. A typical issue will have a clearly written article by a Canadian graduate student describing his or her latest research, a "policy" article by the B.C. provincial apiculturist Paul van Westendorp, a profile of a local beekeeper, messages from the executives of various associations updating readers on what's been happening on key issues, and some imported articles reprinted (with permission, of course) from some of the international journals. And it doesn't hurt that both *Bee Scene* and *Hive Lights* are well-produced, printed on decent magazine-weight paper, have attractive covers, and bring in a considerable amount of advertising, which provides revenue to subsidize all this quality and also an important service to those of us looking for sources of queens, equipment, pollen or bees.

Another personal favorite of mine is the *Speedy Bee*, a monthly newspaper put out by Troy Fore from the great state of Georgia. This publication is more of a newspaper than a magazine, in that it reports news rather than containing in-depth articles on how to keep bees. I love it for that, and enjoy reading about subjects such as the latest lobbying efforts by U.S. beekeepers to keep imported honey out of the United States, recent and prestigious awards given to scientists or beekeepers, the latest adulteration scandal, and occasionally even a political triumph in the beekeeping community where we have agreed on something and made it happen. I also eagerly anticipate the annual

Continued on Next Page

"I value quality in any medium. A well-written catalog from L.L. Bean impresses me more than some of the poorly written classics we all were forced to read in school."

"New Year's Greeting" issue, when advertisers take out small ads that include both the company name and the date it was founded, and extend their best wishes of the season to *Speedy Bee* readers. I read this section avidly and thoroughly each year, from the first beekeeping company founded well over a hundred years ago to the current year's new beekeeping kid on the block.

I also admit to enjoying *Bee Culture*, although I still haven't gotten over the name change, and continue to refer to it as *Gleanings*. Kim Flottum does a superb job of mixing articles, and I appreciate the breadth of regular columnists, beekeeper profiles, topical articles, and "how-to" presentations that grace the pages of this monthly magazine. Kim also makes a real effort to solicit articles with different opinions, and from different sources; *Bee Culture* is one of the few beekeeping journals in the world in which you can read an article by a professor like myself, an extension specialist like Jim Tew, and both commercial and hobby beekeepers, all in the same place. Glimmers of a cohesive beekeeping community in which we mutually respect each others' perspectives and talents and work toward common goals can be found in *Bee Culture*, and Kim deserves our thanks and respect for striving to reach everyone in our community.

Another journal I enjoy is an international one, and new: *Bee Biz*. This magazine is more of a commercial beekeepers' rag, published in England on a quarterly schedule by Jeremy Burbidge of Northern Bee Books, and edited by Ana Lucia Merlo and a team of editors from around the globe. Here the reader can find an article on the latest hive lifter to weld onto your flatbed truck, some tips on trends in the international honey markets, and lots of reports on how beekeepers manage bees around the world. I love *Bee Biz* for its audacity in believing there is a worldwide beekeeping community with common interests, and for its success in publishing well-written, entertaining and focused articles.

I wish I could find some good bee research journals, but unfortunately the publications out there that print bee research exhibit irregular quality, overemphasis on obscure local topics and poor writing. The main outlets for publishing peer-reviewed research include *Bee Science*, *the Journal of Apicultural Research*, *the American Bee Journal* and *Apidologie*, but all four suffer from similar problems, and for the same reasons. First, researchers submit their better articles to journals with wider distribution outside the beekeeping community, in broader fields like entomology, physiology, behavior and ecology. Second, four simply is too many narrowly focused bee research journals. There might be sufficient articles to fill up one with high-quality submissions, but there certainly aren't enough for four that are competing with each other for good articles, even though each of these journals already rejects about half of the articles submitted. Third, research journals attempt to publish articles by researchers from around the world, but to meet that objective they publish many articles of only localized interest, such as "The Pollen-Producing Plants of an Out-of-the-Way Province in an Obscure Small Country." Fourth, research journals are written in academic-speak, which is increasingly difficult even for other academics to access and understand. And finally (those of you who read my column regularly should be able to see this coming), bee research articles are incomprehensible to most beekeepers, and don't make the attempt to transcend language and style in the interests of accessibility to the commodity group that most wants and needs the information.

There is one international journal that attempts to bridge the research-beekeeping gap, and that is *Bee World*, published by the International Bee Research Association. This journal generally doesn't publish individual research articles, but tends toward longer review topics. At least some of the articles are well-written, beekeeper-focused and content-full, and as a stopgap measure for those of you interested in research information, I suggest you try *Bee World*.

However, we need a longer-term solution, perhaps a new international journal called the JUR: Journal of Understandable Research. My vision of JUR is an editorial board consisting of beekeepers, bee scientists, extension workers and current editors. Its mandate would be to present new findings and review articles on beekeeping-related topics, and submissions would be screened for the dual characteristics of quality research and understandable presentation. Authors would be paid for accepted articles to provide an incentive to submit, and the journal would finance itself through paid advertising and a reasonable subscription rate. In other words, a hybrid journal with the readable, engaging qualities of *Bee Biz*, *Bee Culture*, *Speedy Bee*, *Hive Lights* and *Bee Scene*, but with a research focus.

If this idea has merit, how might it happen? There will be an unusual opportunity to meet and develop this concept at the upcoming Apimondia meeting in September 1999, in Vancouver, British Columbia, Canada. One focus of this meeting will be beekeeping journals, and a symposium already has been planned for editors from around the world to speak to and with their readers. We expect anywhere from 30-50 beekeeping newsletters, journals and magazines to be represented at Apimondia, and this concentration of journalistic talent might provide the impetus for some new areas of publishing cooperation, and perhaps even a new journal or two. How about it, editors? Your serve. BC

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

READER'S SURVEY, JULY 1998

Tell Us What You Like, and *Don't* Like

How **interesting** were each of the articles listed below
Check the appropriate box for each article. Thank you.

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623 W. Liberty St., Medina, OH 44256
FAX (330) 725-5624
Email: kim@airoot.com

Extremely	Very	Somewhat	Not-At-All	
Inner Cover – Kim Flottum	❑	❑	❑	❑
News Release – Insect Pests	❑	❑	❑	❑
Mailbox – Reader's Forum	❑	❑	❑	❑
New Products – Book Reviews	❑	❑	❑	❑
Research Review – Roger Morse	❑	❑	❑	❑
Do You Know? – Clarence Collison	❑	❑	❑	❑
Beekeeping Journals – Mark Winston	❑	❑	❑	❑
V *Varroa* Resistance – John Thomas	❑	❑	❑	❑
Extracting Cartoon	❑	❑	❑	❑
Following Fireweed – June Aploks	❑	❑	❑	❑
Not In Any Book – James E. Tew	❑	❑	❑	❑
Colony Balance – Richard Bonney	❑	❑	❑	❑
Breeding Your Best – Linda Batt	❑	❑	❑	❑
Home Harmony – Ann Harman	❑	❑	❑	❑
Bee Talk – Richard Taylor	❑	❑	❑	❑
Q & A – Richard Taylor	❑	❑	❑	❑
Gleanings – All The News	❑	❑	❑	❑
Calendar – Meetings & Events	❑	❑	❑	❑
Smokey Dents Cartoon	❑	❑	❑	❑
Classified – Bargain Pages	❑	❑	❑	❑
DeJong Interview – Roger Morse	❑	❑	❑	❑
Extremely	Very	Somewhat	Not-At-All	

Strategies For Dealing With MITE RESISTANCE To Fluvalinate

John Thomas

The question was not "if," but when mite resistance to fluvalinate would occur. Here's why.

With the documentation of *Varroa* mites becoming resistant to fluvalinate in the U.S. there is clear evidence that the beekeeping industry must understand this problem if we are to develop a mite management strategy that works. Fluvalinate resistance did not come as a total surprise. There has been discussion for several years that we would likely develop resistance in our *Varroa* population because resistance is present in Europe; and the selection pressure on the mite population has been extensive. Selection pressure resulted from the extent of fluvalinate treatment – the frequency of treatment, and the dosage and the percentage of the target population exposed.

In the case of fluvalinate treatment for *Varroa*, these factors contribute to enormous selection pressure. The question was not "if," but "when" resistance would occur. At this time Apistan resistance in mites has been documented in South Dakota, Pennsylvania and Florida. The confirmed resistant populations are believed to have a common geographical origin in Central Florida. This indicates that resistance is rare, but the gene(s) for this trait does exist in the U.S. gene pool.

Since we know that fluvalinate-resistant mites exist, it is important that every U.S. beekeeper understand what resistance is; how it develops in a population; and what management practices are effective in achieving acceptable, economic mite control. To do this we must learn from the mite resistance strategies which have worked in other crop and livestock production systems and avoid the management practices which only aggravate the resistance problem.

It is important that we recognize that there are few tools available to combat *Varroa*. That is a reality that is not likely to change. These limited control tools must be protected if this industry is to survive. Most of us are well aware of the impact of *Varroa* on the feral honey bee population in the U.S. This is a clear example of what could happen to managed colonies in the U.S. should we find that there were no effective *Varroa* miticides available. That would amount to economic devastation for our industry.

Current Situation

There is little doubt that U.S. beekeepers are faced with addressing fluvalinate resistance in *Varroa*. Clear evidence of this has been presented by Baxter, Eischen, Pettis, and others. Based on our experience in dealing with mite and insect pest resistance in over 500 species since the late 1940s and early 1950s, we know that the sooner we address this problem the greater our chances of minimizing the economic losses and preserving the control tools that are currently effective or might become available.

What Is Miticide Resistance?

Resistance has been defined as the capacity of an organism to survive exposure to a toxin. This trait and the gene(s) which regulate it, are normally very rare in the population at first. Otherwise, the initial evaluations of fluvalinate as a *Varroa* control would have found the chemical to be ineffective. An uncommon gene indicates that individuals with this trait are not as "fit" or competitive as susceptible individuals; except, of course, in situations where the selection pressure (fluvalinate treatment) is adversely affective (eliminating) susceptible mites.

Investigations involving pyrethroid resistance in other mite and insect pests have typically found a single gene which confers resistance. This gene may or may not be dominant. At this time, we lack the genetic information that would tell us how many genes are involved and their linkage to other physiological, developmental or behavioral traits. This information will be important in developing the most efficient and effective mite resistance management strategies. It would be risky to even attempt to discuss the specific genetic resistance mechanism in *Varroa* with essentially no genetic studies. We must refer to studies of pyrethroid resistance in other mite species to gain insight into the likely mechanism, genetics and inheritance.

The site of action of fluvalinate and similar pesticides is the nervous system. In mites and insects, these toxins rapidly produce signs of poisoning; such as loss of coordination, convulsions and ultimately paralysis. The mode of action, or cause of death, is exhaustion, loss of muscular control, fatigue and oxygen starvation or depiction.

Dealing with Resistance

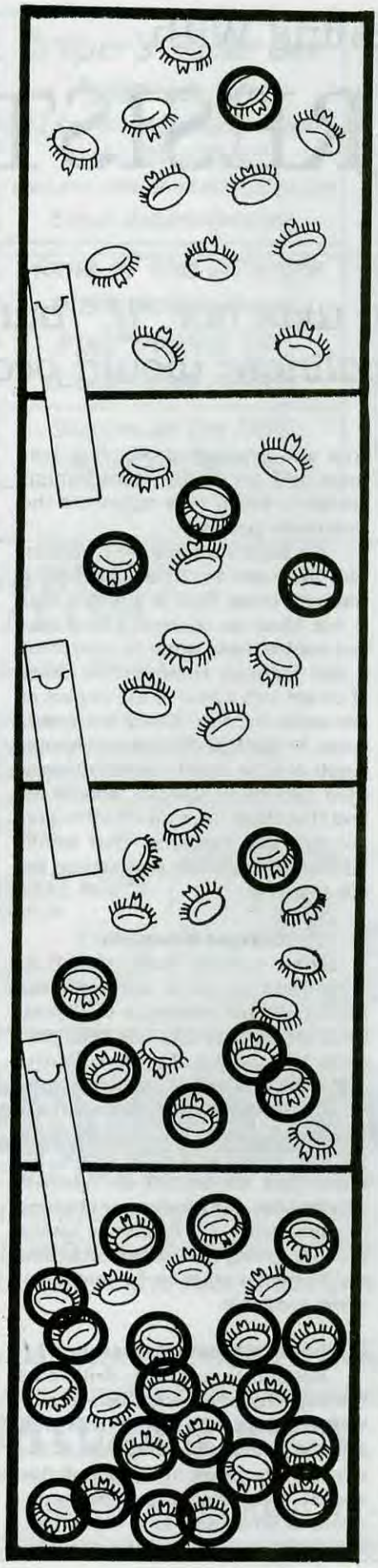
Although we don't have specific documentation in the case of *Varroa*, there is abundant evidence

Continued on Next Page

RESISTANCE ... Cont. From Pg. 23

available for pyrethorid resistance in other mite species to assume that many, if not all, of the same principles and management strategies will apply. The most important factors are:

- Fluvalinate resistance in *Varroa* is heritable and is passed from parents to their offspring (i.e., it has a genetic basis) and the frequency of this trait in the population will be directly related to the extent of the selection pressure we put on the *Varroa* population.
- Genetic selection for resistance is quite different from altering the ability to handle stress in an individual; such as, elevating the tolerance to physical exercise through conditioning. In the case of an heritable trait such as resistance to fluvalinate, this characteristic is either present (in individual resistant mites) or absent (in susceptible mites). Any given population is composed of a mixture of these types. As we place greater selection pressure on the population, the percentage of resistant individuals which will survive treatment increases in the population. There are several common "myths" on the part of some beekeepers: 1) that lower doses of toxicant result in quicker resistance development. The fact is that the quickest way to develop resistance (and the highest levels of resistance) is by using the highest exposure dose of toxicant; thus, eliminating essentially all susceptible individuals and insuring that every mating is between (highly) resistant males and females; and 2) misusing currently effective controls; for example, leaving Apistan strips in colonies longer than recommended significantly increases the probability of killing the few susceptible mites which "escaped" the initial treatment or were reintroduced into the resulting "resistant," controlled population. This simply increases the selection pressure with essentially no additional mite control benefit.
- Fluvalinate-resistant mites very likely will be found to be inferior or less competitive than susceptible mites. There is a "cost" in life for the benefit of being resistant. If that were not the case, resistance should not have been so rare in the population in the absence of the specific selection pressure (prior to fluvalinate treatment). Studies of mite resistance in other species have shown resistant strains to be less productive (fewer eggs produced, longer developmental time in immature stages, etc.), greater frequency of sterility, shorter life cycle, reduced mating competitiveness, altered behavioral characteristics or other inferior traits. There is little reason to believe that we will not find some, if not a significant amount, of these traits in fluvalinate-resistant mites. At this point we simply don't have the data to tell us if this will be a significant factor in the development of resistance management strategies. If significant, it will be extremely important to maintain a susceptible *Varroa* population to replace the resistant strain when we remove the selection pressure. The rate of "removal" or "displacement" of the resistant population will be directly related to the relative competitiveness of the r- and s-strains. When selection pressure is removed, resistant mite strains are less competitive; thus, susceptible mites increase in frequency. The overall population becomes more susceptible after a time with no (or less) treatment. Treatments become effective again; this appears to be the case in Europe.



A stylized view of resistance development in a population of mites. Top – in the general population a small number of individuals have a 'natural' resistance (circles). When the population is exposed to a pesticide, those resistant, and some susceptible mites survive. Resistant and susceptible mate, producing some more resistant offspring. This continues, until most of the susceptible mites are eliminated, and only resistant mites remain.

Clearly, we must look to options for controlling *Varroa* when fluvalinate is no longer effective. The most obvious are other miticides which have a totally different mode of action and site of activity in the mite. Cross resistance is far less likely to be a factor if the other miticide(s) is totally different in its mode of action and the physiological or biochemical system it adversely

affects. The fluvalinate-resistant population then can be treated as a susceptible population, if a functionally different miticide is used. This allows us to prevent the increase of fluvalinate-resistant genes in the population. Alternating miticides with different modes of action is but one of the tactics which have proven effective in dealing with resistance.

The major goal of a resistance management strategy is to significantly reduce the selection pressure which is causing an increase in the frequency of the resistant gene or genes in the population. Other successful tactics used in integrated pest management programs have been:

• Using host resistance. Honey bees which are partially or entirely resistant to mites require fewer, or no, miticide treatments.

•Recognizing and using economic thresholds. Treatment frequency is reduced by treating only when mite populations reach a known, damaging level.

•Using cultural, management or biological controls where possible and practical. At this time, we are extremely limited in our knowledge of effective, colony-manipulative controls except for small-scale beekeepers who are not limited by labor-intensive tactics; such as removing capped drone brood.

• Treating with other miticides. Rotating pesticides with different modes of action has been the most common and effective tactic used in resistance management strategies. This practice has proven much more effective than mixing miticides. The latter has lead to a more rapid selection of resistance to both compounds in field use. The rotation pattern has differed with different insect or mite species and has been dictated by the particular inheritance pattern (gene frequency, gene dominance, genetic stability, etc.). All of this is yet to be determined for *Varroa* and resistance to fluvalinate.

Conclusion

What we currently know about fluvalinate resistance in *Varroa* is:

- it is real
- it is limited in its occurrence and distribution in the U.S.
- it is essential that we begin now to address this problem as best we can; as quickly as we can, or it will only become worse.
- There is a dire need right now to have available at least one, and preferably several, alternative miticides that are effective against fluvalinate-resistant *Varroa.*

It will be extremely important in the design of any effective mite management strategy to know:

- the actual genetic basis of fluvalinate resistance – is it controlled by a single gene? Is it dominant, recessive or only partially dominant?
- Are there inferior traits linked to the resistant gene(s) that will confer important non-competitive behavioral, metabolic, or physiological traits in the resistant strain; enhancing the rate of displacement of those individuals by susceptible mites in the absence of the fluvalinate selection pressure.

Regardless of what we know and learn about resistance in the next few months, this industry will survive only if every beekeeper really understands the fundamental principles of resistance. Only then can we effectively deal with the problem. The mobility of the *Varroa* mite as indicated by its extremely rapid spread following its introduction in 1987, clearly indicates that we will not be able to address this problem on the basis of each individual beekeeper managing his own resistance problem exclusively in his operation. All indications are that resistance will have to be addressed industrywide. You will share successes and *mistakes* with your neighboring beekeeper. BC

The author wishes to acknowledge the review and extremely valuable suggestions provided by Dr. Robert G. Danka, Dr. Frank A. Eischen and Dr. William T. Wilson.

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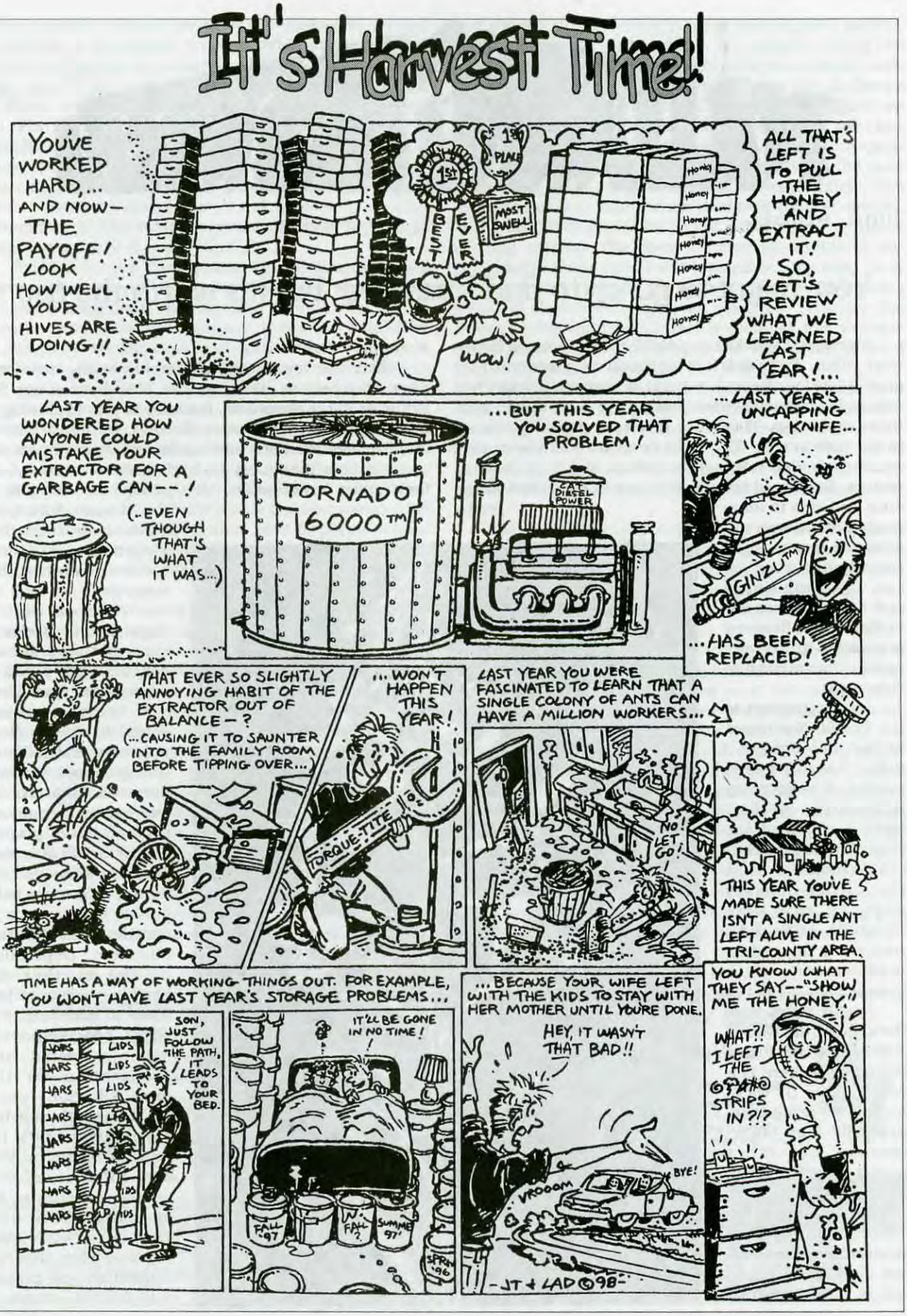
Dr. John G. Thomas was Extension entomologist with Texas A&M University from 1957-1992 (retired). Began beekeeping in 1948 as 4-H Club project. Had responsibility for insect and mite management programs (IPM) for Texas crop and livestock producers and homeowners.

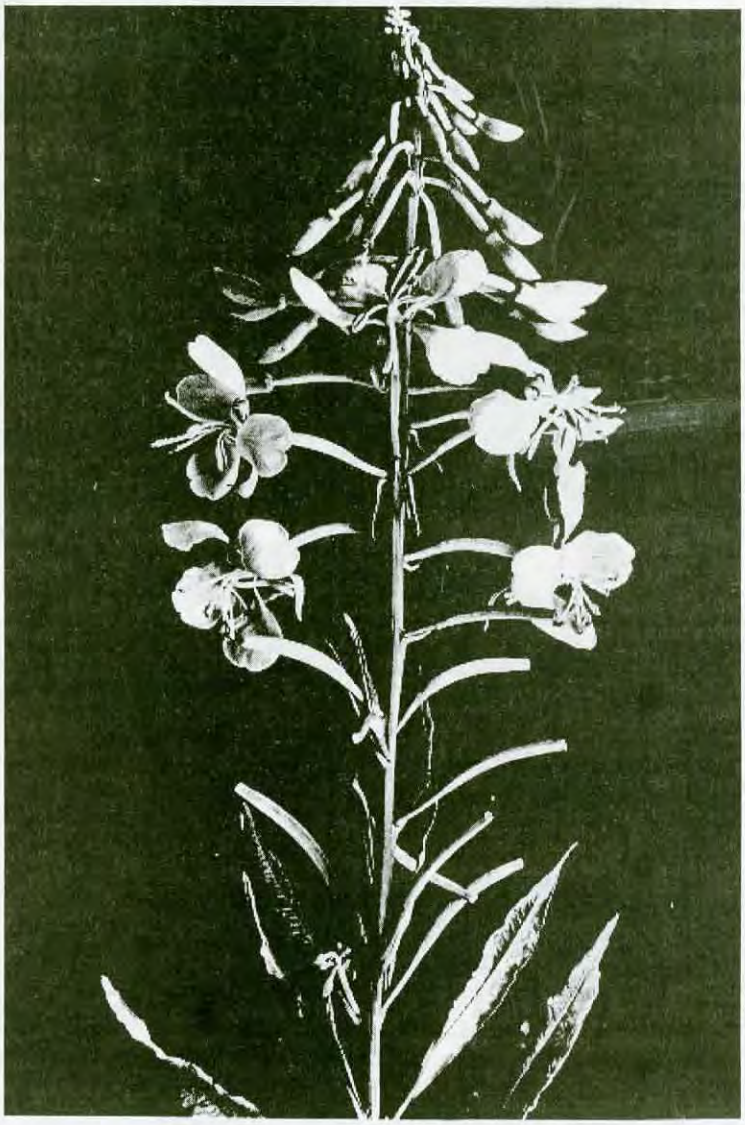

It's Harvest Time!
YOU'VE WORKED HARD,... AND NOW— THE PAYOFF! LOOK HOW WELL YOUR ... HIVES ARE DOING!!
1st PLACE
1st BEST EVER
MOST SWELL
WOW!
ALL THAT'S LEFT IS TO PULL THE HONEY AND EXTRACT IT! SO, LET'S REVIEW WHAT WE LEARNED LAST YEAR!...
Honey
LAST YEAR YOU WONDERED HOW ANYONE COULD MISTAKE YOUR EXTRACTOR FOR A GARBAGE CAN--! (..EVEN THOUGH THAT'S WHAT IT WAS...)
TORNADO 6000™
...BUT THIS YEAR YOU SOLVED THAT PROBLEM!
CAT DIESEL POWER
...LAST YEAR'S UNCAPPING KNIFE...
GINZU™
...HAS BEEN REPLACED!
THAT EVER SO SLIGHTLY ANNOYING HABIT OF THE EXTRACTOR OUT OF BALANCE—? (...CAUSING IT TO SAUNTER INTO THE FAMILY ROOM BEFORE TIPPING OVER...
...WON'T HAPPEN THIS YEAR!
TORQUE-TITE
LAST YEAR YOU WERE FASCINATED TO LEARN THAT A SINGLE COLONY OF ANTS CAN HAVE A MILLION WORKERS...
NO! LET GO!
THIS YEAR YOU'VE MADE SURE THERE ISN'T A SINGLE ANT LEFT ALIVE IN THE TRI-COUNTY AREA.
TIME HAS A WAY OF WORKING THINGS OUT. FOR EXAMPLE, YOU WON'T HAVE LAST YEAR'S STORAGE PROBLEMS...
SON, JUST FOLLOW THE PATH, IT LEADS TO YOUR BED.
JARS
LIDS
IT'LL BE GONE IN NO TIME!
FALL '97
WINTER '97
SUMMER '97
SPRING '98
...BECAUSE YOUR WIFE LEFT WITH THE KIDS TO STAY WITH HER MOTHER UNTIL YOU'RE DONE.
HEY, IT WASN'T THAT BAD!!
VROOOM
BYE!
-JT + LAD ©98-
YOU KNOW WHAT THEY SAY--"SHOW ME THE HONEY."
WHAT?! I LEFT THE @$#% STRIPS IN?!?

FOLLOWING FIREWEED

June Aploks

You've got to go up to find Fireweed, but it's worth the trip.

Fireweed, *Epilobium augustifolium* is a common Northwest plant. Fireweed is a herbaceous perennial that grows up to four feet tall or more, on straight, unbranched stems. Its blossoms open first at the bottom and continue to the top. They have four rose-purple petals up to one inch across. The ovary develops into a long, narrow capsule that releases thousands of tiny seeds when mature. Each seed has a tuft of hair that provides buoyancy and aids in long-range seed dispersal. Fireweed springs up in recently disturbed areas, following burns and logging. Once established, the fireweed population grows very rapidly from seeds and rhizomes.



As a transplant to the Pacific Northwest in the mid-eighties I didn't know fireweed existed. It wasn't until I started my first hives and joined the Puget Sound Beekeepers Association that the purple masses along the road were identified. Little did I realize my impending involvement with fireweed.

Nectar flows vary throughout the United States. In the Puget Sound area there is a maple flow, (if we're lucky), a spring flow, primarily from blackberries, but other spring flowers as well, but usually by mid-July flows are over. There are no major fall nectar flows. Hives often need to be fed in fall to have adequate stores for winter.

There are several advantages to moving hives into fireweed locations. First, as the blackberries are finishing at lower elevations, fireweed is just beginning to bloom at higher elevations. Second, by moving hives into fireweed locations another honey crop is harvested and the bees plug every inch of comb with honey. No fall feeding is necessary. Harvesting honey so late in the season does pose some medication timing problems, but those can be handled in other ways.

When I joined Puget Sound Beekeepers I met several beekeepers with years of experience. One, Dennis Sampson, happened to live in close proximity, and had been transporting hives to a fireweed location for many years. By summer I found myself preparing for my first mountain migration.

My house in Lake Forest Park, north of Seattle, is at 380 feet elevation. Depending on the weather the blackberry flow is late June to mid-July. Supers are removed, honey extracted, and preparation for the move is begun.

There are some basic requirements for moving beehives. The hive entrance, as well as the top, must be screened. This prevents bees from escaping and also provides ventilation and protection from overheating.

Hives must be fastened together or strapped to prevent movement in transport. I prefer nylon straps as they leave hive equipment undamaged. "Kev-Loc" straps are high quality tie down straps, come in 9 or 12 foot lengths, and carry an unconditional lifetime guarantee. Hives must be secured in the truck and netted. Nine hives will fit in the back of my pick-up. Other supplies, veils, gloves, coolers, water, and first aid supplies, and a fire extinguisher fit in the cab. It's a good idea to carry a bucket, shovel and ax as well as extra water. Due to the remoteness and possible dry conditions the smoker is used carefully.

Private timber companies, United States Forest Service, Department of Natural Resources, and Bureau of Land Management offer fireweed permits. Our permit is with a private timber company. It is a two hour drive to our fireweed location just north of Mt. Rainier. A week or two before we move hives one of us will inspect the apiary to check conditions on the logging roads, stage of fireweed bloom, and make adjustments on the bear fence. Power to the fence is connected when hives are moved into the apiary. The fence is battery operated. A car or truck battery can be used. The battery can be disguised by placing it in a deep super, with a bottom and top board. Our 1997 apiary location was at 4000 feet elevation, with a panoramic view of purple mountains, dense with fireweed. Bees have about 1000 feet of fireweed above and about 3000 feet below to the valley floor for foraging.

The hives will remain at the fireweed apiary for four to six weeks. A couple days before the hives are to be moved, I examine each colony. Although I requeen in spring, I check for queen cells and colony strength and make any adjustments that are necessary. A queen excluder and one or two western supers are added at this point. (I run all my hives with westerns for easier handling.) Depending on colony strength two to four more western supers will be added once the hives are unloaded at the fireweed location. By only adding one or two supers before the move, the bees are given some space and height is kept down in the truck. Hives are strapped and screened late in the evening after foragers have returned home. On warm nights, hives often have many bees congregating at the entrance. A couple light sprays of water from a spray bottle will usually encourage the bees to go inside. The hives are loaded and secured in the truck with ropes, and supplies packed.

My husband, Erik, shares his muscle during the whole process which makes going to the mountains much easier and more enjoyable. We depart a couple hours before sunrise. Traffic this early is very light and we arrive at the apiary for the sunrise. Power to the bear fence is connected and hives are unloaded. Before opening the hives it's best to move the truck down the road a bit along with any gear not needed immediately. The bees are not very happy when the hives are first opened, so it's best to be organized before removing the entrance and top screens. The hives are opened, additional supers added, inner covers and tops added, the bear fence is closed and checked for power, apiary identification sign and electric fence sign are attached. Typically, the hives stay from mid-July to mid-September. Every couple weeks we check the fence for power and check to see if more supers are needed on the hives.

Due to the fact that fair season begins just after Labor Day, I usually go to the apiary mid- to late-August and pull several supers of honey to harvest. Fireweed honey varies in color from year to year but is typically light in color. Many years I've entered fireweed honey it has been considered in the water-white category.

The remaining crop is generally harvested in early September. After removing honey supers I insert Apistan and menthol and the hives remain in the mountains another week or two. The northwest has generally cool falls but there are usually warm days in October that Apistan can be removed.

In the seven years that I've gone to the fireweed location I have always been impressed with the production, and condition of the hives upon returning home. Hives have averaged ninety to one hundred thirty pounds of honey. My first year I was a little panicked at the thought of such a surplus of honey. However, my neighbors were discovering I had hives and honey, and it soon began disappearing. One of the local coffee shops, Sunrise Espresso, also uses and sells my honey. Both provide a great opportunity for education of the public on honey bees. BC

June Aploks is a sideline beekeeper and President of the Puget Sound Beekeeper's Assn. She's busy moving bees to Fireweed this month. She also took this month's cover photo.

NOT IN ANY BOOK

The rigors of extracting are seldom discussed!

James E. Tew

An irrefutable characteristic of honey is that it is heavy – nearly 12 pounds per gallon. There is no negotiating this characteristic. Lifting honey, in any form, requires back-breaking labor or expensive mechanisms. Unprocessed honey is heavy in the supers. Frames full of honey are heavy during the extracting process and finally, honey is heavy in jars or buckets – not to mention 55-gallon drums. We can control mites. We can maintain good queen stock. We can have all our hives facing east (or south). We can do many things in beekeeping, but we cannot make our bees make "light honey."

A second irrefutable honey fact is that it is sticky and seems to end up on everything – even clinging to Teflon. Hands, shoes, floors, steering wheels, table tops – all are common places where honey is clearly sticky. Any second-grade elementary class in this country can take two ounces of honey and effectively cover all flat surfaces within a 50-yard radius.

But honey is also hardy. It stores well, and it resists molding or souring. That's good. Anything heavy and sticky needs an occasional positive attribute.

And honey is sweet. Every human, and many animals know this characteristic of honey. It was sweet long before we managed to concoct granulated sugar or squeeze maple syrup from trees.

There it is. Honey is heavy and sticky, but it is a stable, sweet product that is consistently in great demand. Beekeeping humans have spent eons trying to accumulate as much honey as possible. During that time we have developed efficient techniques for coercing honey from its rightful owners – honey bees. We should have the system down pat by now. Yeah, right. There are plenty of problems that can spring up in the best honey production and processing procedures. For your review, I have selected a few of these occasions to discuss in this piece.

I got a good honey crop, but it has granulated in the combs before I could extract it.

Well, you can jack up the speed of your extractor just about as high as you want, but that honey will never sling from the combs. Honey from certain crops, such as canola, granulates quickly, and there is nothing you can do except extract it as quickly as the honey is capped. Then, rather than crystallizing in the comb, it will granulate in storage, but at least you can re-liquefy it as needed either for selling or consuming. What to do with crystallized combs? Give them back to the bees. They made it, let them worry about it. They will use it, somewhat wastefully, to produce more bees. Using crystallized combs for making splits, feeding to wintering colonies, or getting swarms off to a good start, are common uses for solidified honey.

I got hot and tired so I left a lot of bees in the supers. I tried to bounce the supers on the ground to jar the bees out

Broke a lot of frame top-bar lugs, didn't you? A deep frame of honey can weigh as much as nine pounds. Banging deep supers on the ground to dislodge bees frequently breaks the frames along the top bar ends. This is such a common occurrence that bee supply companies sell metal repair parts to put the broken frames back into production. No great riddle here. To prevent frame breakage, don't bounce full supers on the ground.

I put Porter Bee-escapes on the inner covers of my hives (just like the book said), but when I returned to remove the crop, bees were robbing everything.

It happens. Honey is normally taken from the bees after the crop is over; *ergo*, a nectar dearth is underway. If you don't seal all the broken corners and cracks of the supers you plan to remove, marauding bees will find their way back into the supers and re-appropriate the crop. Anytime you plan on using a bee removal device that requires a second trip to the outyard, be certain that all other entrances are blocked. Second, hope for cool weather that will require bees to move down toward the brood nest out of the supers. Even on the best of occasions, you will probably need to brush out the remaining bees with a bee brush (an event the bees just love).

I used a product containing butyric anhydride (probably "Bee Go") to remove the crop. Now my truck smells terrible.

This type of product is an excellent repellent. Smelling a bit like a skunk,(other adjectives have been used, but this is a family magazine) it drives neighbors, relatives, spouses and family pets from the area. This stuff is obnoxious, but descented forms are available. Normally, when removing honey, you are hot and irritable. Bees are numerous and are prone to sting. Your normal impulse is to use more of the product and to work too fast. Wrong, wrong! Use the stuff judiciously, and

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Small Extractors for hobbyists . . .

don't get it on anything but the fume boards you are using. Give it time to work. Upon arriving at the extracting room, let the supers air out for a while before beginning to process the crop. You should also bathe regularly. (Anyway.)

I left a lot of bees in the supers. I thought I would just blow them off on the way home.

Bad move. Honey is a hardy product, but by exposing the crop to dust and dirt on the ride home, you effectively allowed the product to become a bit contaminated – possibly even gritty if conditions were dusty enough. Cover the supers before traveling. It is also important to attach the tops to the supers so they won't go sailing off on the trip home.

Some personal experience here. I was hauling a load home some years ago and watched in transfixed horror in my rearview mirror as a top sailed off the load, bounced once, and then lodged beneath an Audi that was passing me in the left lane. Sparks were flying from the top as it dragged along under the car. I vividly remember trying to make small talk with the driver after we had both stopped and I had retrieved my hive cover. Bees were buzzing all about. The other driver was frightened – both from the bees and from the experience. It was not a good day for me, or I suppose the driver of the Audi. And it could have been much worse.

A big honey crop is the goal of every beekeeper. Bee books are filled with instructions describing how to get the best crop, but little is ever said of the requirement that you, the beekeeper, will be obliged to pick up heavy, sticky boxes – each having small handles, weighing 65-95 pounds, and filled with testy bees. There's no getting around it. Honey is heavy and sticky. Bees are everywhere – stinging you, getting stuck in honey, or flying about in great confused clouds. You ache all over. Your hands, back and fingers hurt. Your gloves are wet and sticky, and you constantly review exactly what it was that first lured you to beekeeping. Then you consider the alternative – what if all these boxes were empty? Either way, it appears that you lose.

. . . to larger units . . .

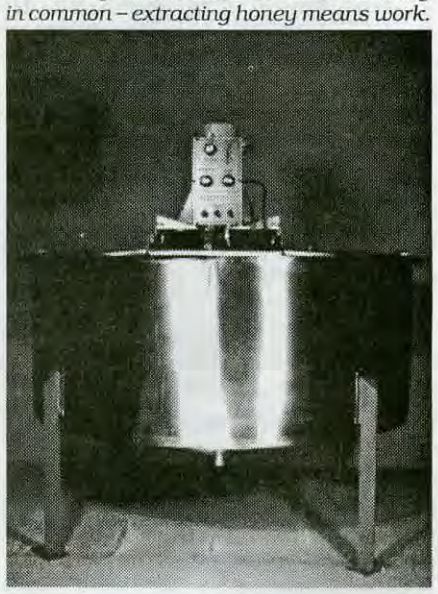
Upon arriving at the extracting room, a new set of challenges awaits you.

The biggest issues here involve something stopping up, something running over, or something breaking. You find yourself with honey in all the wrong places – usually on the floor. Commercial beekeepers have stories of hundreds of pounds of honey running onto the floor. There are no easy solutions. Extracting facilities – all the way from a kitchen table to a full-blown extracting plant – have unique characteristics that should work well, but when they don't, a messy situation usually results.

I knocked off for lunch. When I returned, I found that my filter had plugged up and honey was all over the settling tank and the floor.

Processing honey is a bit like painting a house. First thing, get paint all over you, then you can paint efficiently. Realize that extracting, by design, is a messy business. Have copious amounts of water nearby, and be prepared to be constantly cleaning. Never forget that the honey in lines, filters or sumps can be enough to overwhelm your system when left unattended. What to do with spilled honey? Honey is tough to abuse, but you must always keep the customer, and your reputation, in mind. If you won't eat it, then don't sell it to someone else. Once the honey gets away from you, be prepared to use it only for bee feed. All beekeepers have cans of such honey. The bees can readily use it for developing brood populations. Once I had a newspaper reporter tour the extracting lab. Things were neat and clean – except for the usual containers of broken combs and spilled honey. I thought nothing of it. She asked in a high-pitched voice, "What is this stuff?" to which I responded, "That's just junk honey". I then went on to explain how there is commonly spillage and waste in the processing procedure, and that such honey was commonly given back to the bees during warmer months. The article came out within a few days appearing as though it had been an in-depth discussion on

. . . to 80-frame radials all have one thing in common – extracting honey means work.



"junk honey" and its uses. The term must have been used 10 times. Except for this article, I have never used the term "junk honey," again. I suppose extracting honey is like making sausage. There are some things people just don't want to see.

After getting back to the extracting house, I found that a good deal of the frames are not capped. I am planning just to extract that and mix it with the capped honey.

I need to know how much honey is a "good deal" of honey. If you allow the overall moisture content of your extracted honey to rise above 18.6 percent, there is a good chance that fermentation can occur in your stored crop. You can find yourself with gallon upon gallon of low-grade honey vinegar in swollen plastic containers or leaking jars. Consider setting aside those frames that are only half capped. Give them back to the bees to finish capping or extract the thin honey separately and feed it back to the bees.

I like to give the bees a treat so I let them rob out the wet supers after I extract.

It's not worth the risk for so small a "treat." There are only a few pounds of honey involved. There are risks of spreading disease or of robbing getting out of control. During a dearth, literally hundreds of thousands of bees can be attracted to the odor of exposed wet combs. Common procedures such as smoking the roaming bees will no longer work. Your neighbors or occasional visitors will be subjected to hoards of out-of-control bees. It's just not worth the risk.

All beekeepers have, at one time or another, dozed off dreaming of full supers of capped honey with the smell of fresh honey from nature's larder filling the air. The hum of the extractor sounds like money being made. In reality, a heavy honey crop is a conundrum – it's great to have, but it means a lot of work (just like catching too many fish). Be prepared for hot, tiring work with sticky honey and disoriented bees covering the extracting room windows. Be prepared for equipment failures and leaking fittings. Especially, be prepared for clogged filters (there are no great hobby-type honey filters on the market). However, once the crop is all neatly stored in clean containers, and your professional label shows the pride of your craft, it will all be worthwhile. You'll be making plans for next year's big crop with no thought of the requisite pain. It's all part of the business. BC

James E. Tew is State Specialist in Apiculture, The Ohio State University at Wooster, OH.

COLONY BALANCE

Richard Bonney

Colony Balance is the relationship between the queen and the colony. And colonies need to be in balance.

Over the past two to three years many, many beekeepers across the country have reported queen problems – queens not accepted by the colony during introduction, queens very quickly superseded after introduction, supersedure queens themselves being quickly superseded, queens disappearing from the colony with no apparent reason. No one has yet come up with an all encompassing explanation for why this is happening, although there has been much discussion and speculation. In January of this year, as previously reported in this magazine, the American Beekeeping Federation included a queen symposium as a part of its annual conference, during which these problems were discussed at length.

In most of the discussions, there seems to be an underlying assumption that the queens are faulty upon installation. Among the many reasons suggested have been weather during production (which affects mating flights), the broad effects of mites, the effects of medication, shipping problems, and the shrinking genetic base in North America. As an industry we must continue to look at all of these possibilities and more, but the problems may not all be in the queen production process. Some, probably, many perhaps, but not all. That brings us back to ourselves as individual beekeepers and what we can do.

Those of us who buy our queens have no control over the production process, and we accept the queens we receive. We can select our source more carefully, perhaps, but no queen producer seems to be exempt from the problems reported. We can control how we handle queens and store queens from the time we receive them until the installation process: that has been discussed here by others in previous articles. One other area of considerable importance seems to have had little attention – colony balance.

What is colony balance? Simply stated, it is the balance between the queen on the one hand and the status and resources of the colony on the other. Differently stated, is the queen laying at a rate that is in keeping with the current status and resources? The bees are very much aware of this balance and work to maintain it. At any given time they know the activity and strength of their queen, assuming they are queenright. They know the status of brood rearing – how much and what kind. They know the amount of incoming nectar and pollen, and the amount of food reserves. They will correct any imbalances if it is within their power to do so. For instance, the bees will not allow the queen to lay at maximum levels if there is a sudden cessation in the nectar flow. Conversely, a sudden increase in incoming nectar may cause them to stimulate the queen to lay more. They will remove brood if there is a sudden change in the colony's ability to support that brood. They will supersede their queen if anything happens that causes them to suspect the vitality of that queen. Long term survival is their goal.

How does this all relate to requeening? Consider the possibilities when we requeen an existing colony, or when we introduce a queen into a newly installed package, or when we introduce a queen into a newly made up nuc or split. Each of these latter is a colony – the package, the nuc, and the split – and each has a particular level of strength and resources. The queen being introduced must match that level, within reason. Let's consider a specific example, an overwintered colony that we wish to requeen. Assume it is May, and though you may see the existing queen as failing, the bees of the colony are presumably happy with her since they are not apparently preparing to supersede or swarm. That means that the queen is laying at least one thousand eggs per day, probably more. We requeen with a new, well-bred queen from a reputable queen producer. She may or may not be accepted. Why? To fully understand, let's briefly review the queen production process in a southern beeyard.

First, larvae are grafted into queen cups and a num-

Continued on Next Page

ber of these cups are given to a nurse colony. Here they are tended, fed, and ultimately capped. The capped cells are then taken individually and each placed in a queenless mating nuc. Here the queen pupa matures, emerges as an adult, and becomes the new queen for this nuc. Over a several day period she matures as an adult, mates, and begins laying. All of this is carefully timed by the queen producer, and after an appropriate number of days the nuc is opened and inspected. If all has gone well the inspection will show that the queen has mated and is laying worker brood at an acceptable rate. This being true the queen is taken from the nuc, placed in a queen cage, and is ready for shipment. When we receive her we see this new queen as a laying queen, ready to take over and become the queen of our colony, and she is, although with limitations.

This queen has recently been removed from a mating nuc, a unit usually containing a small number of small frames: she has had a limited number of cells in which to lay. She has been allowed to lay for only a few days, until the first of her brood has been capped and it is clear that she mated and is producing worker eggs. She has not had the space or the time to mature into her full egg laying capability. Then, she is removed from the nuc and placed in a queen cage. No place for laying here. She may remain in the queen cage for a very few days or for many days while she is transported. It may be a quick and easy confinement, or a long and arduous one, but either way she will be traumatized to some degree and her already limited egg laying capability temporarily set back. Then we receive her.

As stated, we tend to see this queen as a mature laying queen ready to take on the demanding duties of colony life. How often do we look carefully at the actual status of this queen and think about how her capability matches the colony's status? How often do we actually think about the colony's status? What is the colony's status? A related question is – why are we requeening?

One reason to requeen is as a part of an overall management strategy. For instance, requeen every year to reduce the possibility of swarming, or to maintain a particular variety or hybrid line. In such instances the colony may be strong and thriving and the existing queen may also be strong and thriving, laying at a maximum rate for the colony conditions – the colony and the queen are in balance. Requeening with a new, young queen will put the colony out of balance, since this new queen cannot step in and immediately lay many hundreds of eggs per day. She must build to her maximum capability, and this will take her many days.

The colony may initially accept this newly installed queen, but through pheromonal signals they may quickly come to perceive of her as faulty or failing. She is not at the moment matching the performance of the queen she replaced. Since the bees of the colony do not see her as an individual, they do not recognize the cause of her apparent faultiness. They simply react to those pheromones, or the lack of pheromones, and specific action is initiated. Supersedure is such an action.

What can we do about this? We can take steps to match the queen to the colony. If, for instance, we have a strong colony that for whatever reason is to be requeened, do not take a queen directly as received in her shipping cage and install her in that colony. First, build her capability. This is most easily done by installing her into a colony that matches her current status – a nuc specifically prepared for the purpose containing a frame or two of brood with covering nurse bees, a frame with a fair number of empty cells ready to receive eggs, and some honey and pollen. This is a relatively weak colony, which matches the status of our relatively weak queen. After a week or two, the queen will have ma-

PHEROMONES

How do the bees of a colony know that they have a queen? Not through personal and direct contact. The thousands of bees in a colony do not recognize a queen simply by coming face to face with her in the hive. In fact, except for one brief period in their lives, most of the bees seldom are near the queen in the course of their daily activities. They are aware of the her presence by detecting her odor, her pheromones. That odor is a part of their environment and is a signal to the colony as a whole that all is well. When it disappears from circulation it is interpreted as a signal to take whatever steps are necessary to requeen.

If a beekeeper requeens abruptly, that is, if the old queen is removed from the hive and the new queen is introduced immediately, the colony will probably react negatively to that new queen. The old queen's pheromones continue to circulate in the hive for a time after her removal, and the colony will consider itself to be queenright. Delay requeening for a few hours, perhaps overnight, so the colony has time to realize that it is queenless.

WHEN?

A frequent question asked by backyard beekeepers is – "When is the best time to requeen?" Another related question is – "Is it okay to requeen in the summer?" Often this question will be given a very specific response – "requeen only in the Spring," or "requeen only in the Fall," or whatever the prejudice may be of the one providing the answer.

In fact, it is okay to requeen any time during the active season, provided colony balance is respected and preserved. However, no matter when requeening takes place, success is more likely during a nectar flow or when a colony is being fed.

Keep in mind, though, that even in a long established colony, balance is variable at different times of the active season. In the spring the queen is going all out to build population, and colony expectations are high. In the fall, egg laying is tapering off as the end of the season approaches. Expectations are correspondingly lowered.

tured and be laying at a much more suitable rate – assuming of course that we have given her enough empty cells and other resources to encourage such laying. Now, after removing the old queen, we can transfer some or all of that nuc, with the new queen, into the colony to be requeened. (If you are thinking now – "I can't do this, I don't have a nuc box" – then maybe its time to get one.) The new queen, being buried so to speak, in the center of her nuc is not immediately noticeable to the bees of the parent colony. By the time they come across her, the colony odor will be her odor.

Now let's think again about packages, nuc's, and splits. Even though each of these is a relatively weak colony, problems can arise when installing queens depending on the specific equipment makeup of each unit.

A package may be installed on foundation, on drawn comb, or on a combination of the two. A new queen installed with a package on foundation is in balance. The queen is prepared to lay at a low rate, and the number of available cells is initially low, as are other colony resources. They will build together. A new queen installed with a package on drawn comb may not be in balance. The queen is prepared to lay at a low rate, but hundreds of drawn cells may be empty and waiting. The colony may perceive an imbalance.

A newly prepared nuc can have similar problems. If it has been put together with only a few empty cells, colony expectations will be low, and balance will be achieved as the queen matures and as cells become normally available, or as you add empty frames. If the nuc initially has many empty cells, though, the colony may lose patience with this immature queen.

A split, of course, is the term we use to describe the result of dividing an (usually) overwintered colony into two more-or-less equal colonies. One of the two resulting colonies keeps the old queen while the other receives a new queen. Splits, by their nature, are variable in makeup, depending on the strength and makeup of the original colony, and can have the same problems or lack of problems as do packages, nuc's, or standard colonies. The same considerations apply.

As an exercise, next time you are working with your bees, look at the balance and think about requeening. What would you have to do to make a new queen acceptable to that colony? Such an exercise is not difficult or time consuming, but if you consciously think about it now and then over the season, you will be better prepared to requeen when and if it becomes necessary. BC

Richard Bonney is the retired Extension Educator for the State of Massachusetts, and a regular contributor to these pages.

BREEDING YOUR BEST

Linda Batt

Norm Farmer and Kirk Webster share secrets for better bees and better beekeeping.

It seems like every product out there is "new and improved." Some beekeepers could actually say the same thing about their bees and pass the truth in advertising test.

Norman Farmer and Kirk Webster engineer new and improved bees every year. "I work for better and better bees," says Farmer. "You can't say 'I did that last year' and it's over. You have to improve your stock annually."

Each year, he says, he breeds the best to the best and hopes for the best. With 54 beeyards and over 500 hives in his Connecticut location, Farmer has a large-scale operation. Still, he suggests that even small keepers attempt some "genetic manipulation" as he calls his breeding experiments.

Kirk Webster is doing his own strain improvement at his operation in Middlebury, Vermont. "I'm in the Champlain Valley. I can drive into the mountains and find an isolated area. I mate half my bees in the valley and half in the mountains. That way I can see if I'm making progress," he says. Webster also recommends that even small-scale keepers try some of the genetic engineering methods he uses.

Both men say the start is good record keeping. Details about honey production, gentleness, Winter survival, mite resistance (or tolerance), housekeeping habits and more should be documented each year.

Farmer actually designs test situations and records the results. For example, he killed brood by sticking a needle into the cells and then placed the dead brood in various hives. "Some bees never touched the dead brood. Bees in other hives opened the cells; still others opened the cells, removed the larvae, and cleaned the cells. The queen was laying eggs in the cells in a day," he reports. These last hives, because of the bees' housekeeping instincts, would probably be more resistant to foulbrood disease and perhaps more resistant to mites.

When the best hives have been identified, they should be isolated from the rest if possible. This is difficult since drones and queens travel long distances during mating, but Farmer suggests finding a spot five miles from any other hives. While not perfect, the five-mile distance does insure less outbreeding.

Kirk Webster uses natural geographic dividing features. Taking bees up into the mountains or across a large body of water may control the mating.

Controlled mating yards are easier to establish now than they were in the past since the number of hobby beekeepers has decreased and wild bees have died from the mite problems. It is ideal to have two such isolated mating yards with five to eight strong hives in each spot.

Hives with exceptional traits may be part of your present beeyard. "I've got one hive in one of my yards that gave me nine supers of honey. That's almost unheard of in Connecticut," Farmer reports. It is one he plans to isolate and then use for breeding.

Hives with exceptional traits can be purchased. You might buy some Winter-hardy stock from Webster, Farmer or another supplier and isolate those colonies as breeders. Before using them for this purpose, observe how they are performing for you to insure success.

Norman Farmer tells of another source of strong stock. "A guy in New York gave me 250 hives. They had all died but one. Another man in East Hartford gave me 55 hives. Only one was alive." The surviving bees are probably genetically superior, resistant to disease and more capable of Wintering over. Farmer plans to use these bees in his breeding program.

Both Farmer and Webster caution keepers about taking equipment and bees under these conditions. "The spores of American foulbrood stay alive forever," warns Webster, but he adds that this problem is easy to spot. Before accepting used equipment or surviving hives, he suggests having a bee inspector or an expert beekeeper look over the colonies and materials for disease. The bees may, however, have died from the elements, and those left are sure to be more Winter-hardy.

Now with two beeyards, each with five to eight strong hives, the trick is to carry queens from one strong yard to the other. The outbreeding further improves the genetic line of the bees. Both Farmer and Webster use grafting to produce more queens and then carry new nuc colonies of the one strain into the other yard.

"Grafting takes practice," says Webster, "but it's not mysterious. Most of the supplies are readily available. A breeder hive is just a standard 10-frame hive with a special placement of a queen excluder. The queen is given only one comb per day for egg laying. After a day, the frame is removed to another part of the hive.

On the third day, when the larvae are about 12 hours old, they are ready to be placed in queen cups with a grafting tool. These cups are available commercially.

The queen cells are put into starter hives which are well-supplied

Continued on Next Page

with honey, pollen and young nurse bees. The nursing duty in the colony is assumed by bees who are four to 14 days old with the bees seven days old and older making and feeding royal jelly.

"I put 60 queens cells in the first day, 60 in the second day, and 30 in the third day. The bees will wear themselves out putting royal jelly around the larvae," Farmer says.

After 24 hours in the starter hive, the queen cells are put into finisher hives where they stay until emerging. Each new queen and several frames of bees, honey and pollen make up a nuc box. The nuc box is used to begin a new colony.

More detailed instructions on grafting should be obtained from a experienced commercial beekeeper or from one of the excellent texts on the subject before this method is attempted.

"Grafting for a few queens is a lot of work," Webster says. "If I were a small-scale beekeeper, I'd find another way to get queens." Webster suggests propagating by splitting the best colonies. "People here in the valley have been using this method for years with good success," he says. "I've worked with them."

According to Webster, these beekeepers make a nuc box with one frame of honey, one frame of eggs and larvae, one frame of sealed brood covered with bees, and top it off with another frame of pollen and honey. "They don't even find the queen. They handle the frames and look for her as they work," he says. The queen should be left with the parent colony. When the box is assembled, they move this fledgling colony to the other beeyard.

Then they usually place the nuc in a small hive with other frames of drawn comb. The hive entrance is restricted, and then the restricted opening is shut off with dried grass to prevent robber bees from entering. By the time the grass withers so the inside bees can remove it, the colony has identified with the new location.

Colonies are divided after the Spring buildup and before the heavy honey flow. The time varies depending on location and seasonal weather conditions.

"People say that if you divide up the bees in the brood, you have no control over which larvae are chosen," Webster says, but he reports good results when the nuc box is well-supplied with honey, pollen and bees.

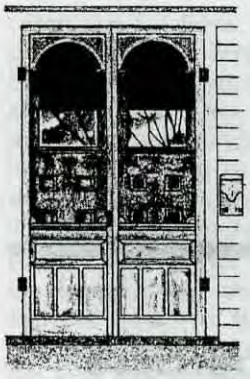
The selection of a line and then the outbreeding of those bees with a second selected line often produces a superior bee. It is the procedure used to improve strains sold by Norman Farmer and Kirk Webster. The process must be repeated year after year, however, to keep a strong line.

Both Farmer and Webster have almost eliminated tracheal mites from their colonies by breeding bees resistant to that problem. "I haven't treated for tracheal mites in years," Farmer says now. The bees raised by these two experts are also more successful at Wintering in cold climates and are well-adapted to their environment.

Honey production, gentleness and good housekeeping qualities have also been bred into their colonies. Their selective mating is a constant process begun over and over each year.

It does pay off and is worth the effort according to these experts. Remember Norman Farmer's motto: Breed the best to the best and hope for the best. BC

Linda Batt is a freelance writer and small-scale beekeeper herself.



Ann Harman

Home Harmony

Making Ices

It's time for the Fourth of July! It's time for picnics! And it's time for something cold and refreshing. Instead of honey ice creams, we are going to have an assortment of frozen dessert recipes. Actually these honey treats can be appreciated any time, so don't save them for a special occasion. You might like to have one of the citrus ices for breakfast on a hot Summer day. Before we start, perhaps a few definitions would be helpful.

An ice is basically sweetened fruit juice or pureed fruit that is frozen. The terms sorbet and sherbet are probably the most confusing. Technically sorbet is pureed fruit or fruit juice combined with a heavy syrup and beaten while freezing to achieve a smooth consistency. A sherbet usually has egg white, or sometimes milk, added for smoothness.

Although recipes for ice cream and ices seem to call for a large proportion of sweetener, the reason is that they are cold. Cold numbs our taste buds so we do not sense small amounts of sweet taste. Therefore, the sweetener is increased to give a sensation of sweet. The honey that we use not only sweetens, but also enhances the tastes of the various fruits.

With the assortment of ice cream makers available today, you can create an ice quickly and easily. If you wish, you can also use just a freezer. However you approach freezing your mixture, remember that the more water the mixture contains, the bigger the crystals will be. The ice crystals are the reason you need to beat the semi-frozen mixtures several times during freezing if you are not using some type of churn. Even if you do end up with some crunchy crystals, the frozen ices are very refreshing.

Any of the frozen ices can be made into popsicles if you wish. After the mixture is slushy-frozen in a churn or partly frozen in a freezer after a couple of beatings, it can be put into paper cups or popsicle molds. A popsicle stick can be stuck in as soon as the mixture is hard enough to hold the stick upright. Freeze hard. The paper cups can be peeled away or can be slipped off after the popsicle sits a few minutes at room temperature. You can hurry up the popsicles by omitting the beating as they freeze. For some reason the crunchy ice crystals in a popsicle seem pleasant.

HONEY WATERMELON MINT ICE

Although watermelon is fun to eat just as it is, you might want to try this recipe. The addition of lemon and fresh mint is delicious. You will need to take the seeds out of the watermelon – I use a nut pick, but you probably have a favorite way already.

6 cups watermelon, seeded and cut into chunks
2 tablespoons honey
1 tablespoon lemon juice
1 tablespoon fresh mint, chopped

Place watermelon chunks in food processor. Drizzle honey over watermelon and add lemon juice and mint. Process until mixture is smooth. If you are going to use your freezer, pour mixture into shallow pan and freeze. Remove from freezer and let sit at room temperature about 5 minutes or until you can cut it into chunks. Place frozen chunks in food processor and process until smooth. Serve immediately, garnished with a fresh mint leaf or cover and return to freezer until ready to serve. Serves 6.

Golden Blossom Beeline

HONEY-STRAWBERRY ICE

Since this next recipe contains an egg white and gelatin, it could be termed a sherbet instead of an ice. Keep the recipe handy for bumper strawberry crops from your garden.

3 cups puréed fresh strawberries
3 tablespoons fresh lemon juice
pinch of salt
1-1/4 cups honey (a one-pound jar, fully drained)
1 cup water
1 envelope unflavored gelatin
1 egg white

Combine strawberries, lemon juice, salt and honey. Stir until thoroughly blended. Combine 2 tablespoons of the water and gelatin in a small saucepan. Heat, stirring constantly, until just melted. Remove from heat and stir in remaining water gradually. Add to strawberry mixture. Beat egg white until soft peaks form. Fold carefully into strawberry mixture. Freeze by your favorite method.

The Honey Kitchen
ed. by Dadant & Sons

BANANA-ORANGE SHERBET

This next recipe would make a perfect breakfast sherbet. It's also great for a midnight snack.

3 bananas, mashed
juice and grated peel of 1 lemon
juice of 2 oranges
3 cups water
1/2 cup honey
2 egg whites, stiffly beaten

Mix together bananas, lemon juice and peel, and orange juice. Bring water to a boil. Add honey and stir to dissolve. Add to fruit mixture and mix well. Let cool. Fold in beaten egg whites. Freeze by your favorite method.

The Honey Kitchen
ed. by Dadant & Sons

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Richard Taylor

Bee Talk

"Stay ahead of the bees, because it is always later than you think"

I have often noted on this page that the primary rule of beekeeping in my opinion is to have strong colonies. Of course you can't always do that; there will always be some weak ones, through no fault of the beekeeper. But it is what you should aim at, not only for bigger honey crops but for *disease* resistance. That rule, however, is to some extent derivative from another, which is, to keep ahead of the bees. It is always later than you think. Fall a step behind and you pay for it.

Beginners are slow to catch on to this. Every May, and even as late as June, I get calls from people saying they would like to get started with bees, maybe get a hive or two. Too late.

I got a fresh reminder of this way the bees have, of always being farther along than you would expect, when I was summoned to gather a stray swarm on the first of May. That is very early for swarms in this latitude, and moreover, it was perhaps the biggest swarm I have ever seen. There was no guessing where it came from; there were no beekeepers in that area that anyone knew about.

A couple weeks later I got another reminder. A friend, who was recovering from surgery, asked me to help him requeen his seven hives. Five appeared to have swarmed already; I could find no queens in those, nor *any* eggs. If they had swarmed there must have been virgin queens there, but they are pretty hard to spot. In the sixth hive I found what looked like a virgin queen, so maybe that one had swarmed too. And of course there were some queen cells. But the bees usually demolish queen cells after the colony has swarmed, so the fact that you find none is no proof that the colony has not swarmed, nor does the fact that there are queen cells prove that they have swarmed. You just can't be sure.

The seventh hive had a laying queen and brood; but it was also very weak.

General conclusion: Most of the colonies were a few steps ahead of me, and the lesson to learn is: Try to keep a step ahead of them. Know your swarm prevention measures early. Get the supers on before you think the bees could possibly need them. You are likely to be pleasantly surprised a week later to find them filling with honey. And do your medication on time.

This last one I learned the hard way, three years ago. This was the summer of '95, and the bees were doing wonderfully. I think that was the summer I got the largest honey crop ever. I went off to the E.A.S. meetings in Ohio that Summer in high spirits. Maybe, I thought, the mites won't be such a problem after all. The bees were still bringing in nectar in August, and the colonies were so strong that they were plastered all over the fronts of the hives. I waited until late August to put in the Apistan strips – and then came the awful truth!

The colonies were so weak that I could tell at once they were not going to make it through the winter. How come, then, there were all those masses of bees plastered on the fronts of the hives? That has always been for me a sign of very populous hives. Not this time. What was happening is that the hives were becoming so infested with Varroa that they were driving the bees right out of the hives. At least, that is what I concluded. But now, how come the record honey crop? I think I found the explanation for that, too. I was told by experts that *Varroa* mites attack the foraging bees *last*, so what was happening, apparently, was that what bees left were mostly foragers, and there was not much brood left to consume the surplus honey.

And I was right about the bees not making it through the winter. I lost every colony. A lot of beekeepers did.

Now of course beekeepers are pretty reluctant to take supers off and do the Apistan treatment in early August, which is when you've got to do it, at least at this latitude. You're going to miss all the fall flow by doing that, and the fall flow, mostly goldenrods, are sometimes very heavy. It's not a problem for me, because I'm a comb honey beekeeper, and fall flows do not make good comb honey. So I always just leave that for the bees. But there is a solution to this problem for beekeepers who want to

catch the fall flows, and that is, to put the Apistan strips in the hives in early August, which is when they should go in, leave them there for just a few days, or until the fall flows are about ready to begin, remove them, then put them back in after you have garnered the fall honey The reason this works is that most – maybe eighty per cent or more of the exposed mite – of the exposed *Varroa* mites are knocked down within the first day or two after the strips go in, and that is good enough for awhile. Once you have taken the strips out, however, the mites begin to build up again, so you've got to put them back in when the honey flow is over. This is because there are many, maybe very many mites developing in brood cells that were not exposed to that treatment.

Then what are you going to do, leave those strips in the hives all winter? No.This is against the rules.

Still, through all this, the lesson remains:

Don't merely be on time; be ahead of time. BC

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

HOME ... Cont. From Pg. 43

APRICOT-GRAPEFRUIT SHERBET

Apricots combine well with other fruits. Here is an opportunity to use them in a sherbet.

1 cup water
2/3 cup honey
1-1/4 cups grapefruit juice, freshly squeezed
1 cup apricot purée
1 tablespoon lemon juice
1 egg white, beaten stiff

Combine water and honey in a small saucepan and boil for 5 minutes. Cool thoroughly. Mix grapefruit juice, apricot purée and lemon juice. Stir into the cold syrup. Put into freezer or churn and freeze to the consistency of soft mush. Stir in the beaten egg white. Continue processing until ready to serve. If not serving immediately, store in freezer until about 15 minutes before serving. Makes 4 to 6 servings.

Naturally Delicious Desserts And Snacks
Faye Martin

GRAPE ICE

Grape juice is always popular. You can choose the rich purple juice or the white grape juice for this ice. It is quick to make and very pleasant.

3 cups unsweetened grape purée or juice
3 cups apple or pear juice
1/2 cup honey

Mix all ingredients well and freeze by your favorite method.

Honey & Spice
Lorena Laforest Bass

ORANGE-LEMON ICE

Here is a recipe that can be served immediately after being made. You can adjust the sweetness to your taste with the addition of more honey.

1 cup orange juice
1/2 cup lemon juice
1 tablespoon chopped orange with peel
1 tablespoon chopped lemon with peel
1 tablespoon honey
1-1/2 cups ice cubes (about 9)

Put orange juice, lemon juice, orange pieces, lemon pieces and honey in a blender and blend until fruit is puréed. Then add ice cubes and process at high speed until mixture is a snowy consistency. Serve at once. Makes about 3 cups

Naturally Delicious Desserts And Snacks
Faye Martin

KALEIDOSCOPE HONEY POPS

There's nothing better on a hot afternoon than to sit in the shade and munch on these fruit popsicles. Use whatever fruits, melons and berries are in season. You can leave berries whole, but cut other fruits into small pieces.

2-1/4 cups water
3/4 cup honey
3 cups assorted fruit, cut into small pieces
12 (3-ounce) paper cups or popsicle molds
12 popsicle sticks

Whisk together water and honey in pitcher until well blended. Place 1/4 cup fruit in each mold. Divide honey mixture between cups. Freeze about 1 hour or until partially frozen. Insert popsicle sticks; freeze until firm and ready to serve. Makes 12 popsicles.

Sweetened Naturally With Honey
National Honey Board

HONEY AND FIG SORBET

This next recipe is truly gourmet quality. But don't save it just for guests. If you like figs, make some for yourself and eat it all up.

1-3/4 pound can (or equivalent of smaller cans) of figs in syrup
2/3 cup honey
4 tablespoons lemon juice
white rum for serving
whipped cream for decoration

Drain the figs and reserve the syrup and 4 of the figs. Purée the remaining figs with the reserved syrup, honey and lemon juice. Freeze by your favorite method. About 30 minutes before serving, transfer the sorbet to the refrigerator. Pour a teaspoon of white rum over each portion and decorate with a swirl of whipped cream and a reserved fig. Serves 4.

Ice Cream
Hilary Walden

Actually there is no need to save ices just for Summertime. They can make a refreshing dessert after a heavy Winter's meal. Try ices all year-round. And experiment with different fruits and juices. In that way you can make your own specialty ices.

?Do You Know? Answers

1. **True** Individual workers in a single colony show considerable variability in their defensive responses, older bees generally being more sensitive to disturbances. This is partly because of their location within the hive. Older bees are normally found in the outer regions of the brood nest and closer to the hive entrance than the young workers. Older bees are also more sensitive to alarm pheromones than the younger bees.
2. **True** Workers have a vestigial, nonfunctional spermatheca and also lack the various genital structures with which the queen can mate and accept sperm from drones.
3. **False** The natural life span of the queen is determined by the number of sperm stored in the spermatheca rather than the number of eggs she lays. She will be superseded and killed by the colony when her sperm supply is depleted.
4. **True** Spiracles are the small breathing pores located on the sides of the body. They are connected directly to the tracheae and are involved in the exchange of oxygen, some carbon dioxide and water vapor.
5. **True** The thorax of insects is generally composed of three segments, but in the honey bee as well as most hymenoptera, the first segment of the abdomen has become the last segment of the thorax and is called the propodeum.
6. **True** The bee circulatory system is an open one, with only a dorsal heart and aorta to assist in blood circulation. The blood fills the bee's body cavity, so that cells float freely in blood rather than receive blood through vessels.
7. **True** Bees have no lungs for breathing; rather they use a system of tubes which carry oxygen to and carbon dioxide away from cells. The endings of the tracheae, the tracheoles come into contact with practically all the body cells. Hence the exchange of oxygen and carbon dioxide occurs without any necessity for blood as a carrying medium.
8. **True** The honey bee's central nervous system consists of a dorsal brain and a row of ventral ganglia joined by paired longitudinal connectives. The ventral nerve trunk consists of seven nerve masses or ganglia. The first two are located in the thorax and in the abdomen there are five ganglia that innervate abdominal segments III-VII.
9. **False** The chief function of the compound eye is the perception of objects. In addition, the compound eye can analyze polarized light, thus permitting the bee to use the sun's position as a compass during flight.
10. A) 100
11. To supply nutrients to the sperm stored in the spermatheca, so that they will remain viable for several years.
12. Nurse Cells, Egg Cell, Follicle Cells
13. H) Scape
14. J) Labrum
15. C) Ostia
16. K) Ommatidium
17. L) Corbiculum
18. F) Coxa
19. N) Apodeme
20. P) Basitarsus
21. O) Arolium
22. I) Flabellum
23. E) Valve Fold

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

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

Questions?

Do They Mix?

How do you mix oil and sugar for use in counteracting mites?

Lloyd Tyler
Coudernport, PA

This is effective only against tracheal mites, and has no effect on Varroa, which is the more serious problem. The standard method is to warm vegetable shortening to the point where it will mix easily, then mix it thoroughly with granulated sugar, so that the mixture can be made into hamburger-size patties, which you lay on the tops of the frames in the brood nest. By coming into contact with this, the bees become somewhat resistant to the tracheal mites. Another method is to simply add vegetable oil to granulated sugar, stirring to get a thick mixture, and ladle this onto the top bars.

Survival

Are there still feral bees in North America? Or have mites destroyed them all? Can honey bees survive without us? This question came up when I recently removed a derelict hive, untended for years and the wood rotted. It was a strong and healthy colony.

Stu Summer
Hillsdale, NY

You raise an interesting question, whether honey bees are going to survive without human intervention. The feral bee population has been devastated by mites but, as your experience shows, some colonies have survived. I believe, but do not know for sure, that bees will eventually develop resistance to *Varroa* mites, as the Africanized bees in Brazil seem to have done. It is known (1) that bees are capable of learning and adapting, and (2) that they do not tolerate other species in their nests if they can help it. They attack them. It seems likely, then, that they will in time learn to attack *Varroa* mites, though not the tiny tracheal mites, but I have no idea how much time. Researchers are experimenting with developing resistant bees, and report some degree of success.

How Far Can I Go?

How many miles from my house can I go to buy honey, put it in my own containers, and still label it as local honey?

Name Withheld

"Local" is a vague term, but so long as the honey comes from an area not too far away that has similar honey flows, I do not think the term would mislead. For example, the honey from northern Vermont is quite different from that of southern Vermont, so what would be local in the north would not be local in the south. Iowa, on the other hand, has similar flows throughout the state, so that would all be local, more or less. The only concern here is whether the purchaser might be misled as to what kind of honey was in the jar.

Menthol - Yes or No?

Last Fall I treated my bees with both menthol and Apistan, and a few days later collected 375 mites on the sticky bottom board. This Spring when I tested, I found only six mites, so I did not treat for *Varroa* but did treat with menthol, Fumidil-B and an extender patty, to combat tracheal mites, nosema and AFB. Was there any point in using the menthol? What is the difference between a grease patty and an extender patty?

Henry J. Hochstettler
Stoneboro, PA

I do not think menthol is very effective at your latitude, because it works only in warm temperatures. A grease patty is made by mixing vegetable shortening and sugar, and the presence of the vegetable shortening is quite effective in keeping down tracheal mites. An extender patty is the same thing with Terramycin added. A grease patty can be left in the hive all year, unlike the extender patty, which contains an antibiotic. It is probably not necessary to use extender patties unless there is a history of AFB in your area. Two or three Spring dustings with terra should be sufficient. *Varroa* populations start out very low in the Spring, as you noticed, but then build up to devastating strength, so it is necessary to treat with Apistan in the Spring, before supers go on the hive, and again in August, after the supers have come off. It is not really necessary to treat for nosema with Fumidil-B, because the bees usually overcome this by themselves, though some beekeepers do consider it a good idea.

Bee Space

I put a full-depth hive body with 5-3/8-inch frames in it on top of a colony so the bees could clean the comb up. That left about a three-inch space under the combs, and the bees built comb, mostly drone, on the bottoms of those frames. On one of the combs the bees were all clustered, like a small swarm. What was happening here?

Jack Sullivan
Chesterfield, IL

The bees always fill empty space in a hive with new comb, often with drone comb. The bees you saw clustered there were probably making new wax, for comb building.

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

Answers!

Richard Taylor

Gleanings

JULY, 1998 • ALL THE NEWS THAT FITS

September, 1999

APIMONDIA IN BC

Apimondia'99 is developing into a beekeeping event you do not want to miss!

Held every two years, congresses of Apimondia (the International Federation of Beekeeping Associations) are a source of new ideas about all aspects of bees and beekeeping from around the world. The next Apimondia congress will be held in Canada, September 12-18, 1999, at the spectacular Trade and Convention Centre on the Vancouver waterfront.

The theme of Apimondia'99 is "Beekeeping in the New Millennium." Mark Winston, a *Bee Culture* columnist from the Vancouver area and Chair of the Program Committee, is excited about what he believes will be "quite simply, the best beekeeping meeting ever held." More than 150 speakers have been invited to participate in large plenary sessions and smaller symposia on dozens of aspects of beekeeping and bee research topics. Hundreds of other speakers will be presenting submitted papers and posters.

The confirmed speaker list reads like an international Who's Who of Beekeeping: Adee (USA), Anderson (Australia), Beetsma (Netherlands), Crewe (S. Africa), De Jong (Brazil), Delaplane (USA), Flottum (USA), Fries (Sweden), Guzman (Mexico), Goodwin (UK), Koeniger (Germany), LeConte (France), Matheson (New Zealand), McKenna (Canada), Milani (Italy), Spivak (USA), van Eaton (New Zealand), and many, many others. It will be a long time before you will have the opportunity again to hear such a diverse group of high quality speakers at one meeting.

ApiExpo'99, the apicultural trade show, also will take place inside the Vancouver Trade and Convention Centre. It will feature more than 150 displays of beekeeping equipment, honey and other bee products, miticides and other chemicals used in beekeeping, alcoholic beverages containing honey, beekeeping journals, ancient smokers, and everything else associated with beekeeping!

The Second Circular with full details about the meeting is scheduled for mailing in October, 1998. To receive more information, contact: Apimondia'99, c/ Venue West Conference Services, #645-375 Water Street, Vancouver, BC, B6B 5C6, Canada; Fax: (+604) 681-2503; E-mail: <congress@venuewest.com>. Please indicate clearly if you are interested in renting space for a commercial display. Check the website regularly for more complete, up-to-date information: http://www.apimondia.99.ca

ALMOND CROP REPORT

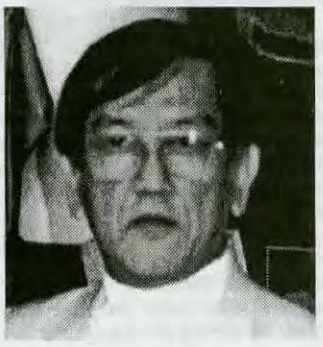
The May 11, subjective forecast for the 1998 almond crop is 550 million pounds, shelled basis, according to the CA Agricultural Statistics Service (CASS). The forecast is based on a survey of growers by CASS.

The 1998 estimate is down 27% from the 1997 record-breaking crop of approximately 750 million pounds.

CASS also released the results of their 1997 acreage survey, funded by the Almond Board of California. The survey indicates 410,000 bearing acres and 62,958 non-bearing acres for 1997. CASS forecasts the 1998 bearing acreage will be 425,000 acres.

Morse Retires

DR. SHIM IS PRESIDENT



The Chairman and Council of IBRA are pleased to announce that Dr. Hachiro Shimanuki will be president of the International Bee Research Association for the next two years. He succeeds Professor Roger Morse in the office.

Dr. Shimanuki is one of America's leading bee scientists and heads up the Bee Research Laboratory of the United States Department of Agriculture at Beltsville in Maryland. He began working with bees in 1959 and has been a member of IBRA for many years. The bee culture branch of the U.S. Department of Agriculture and the Agricultural Research Service have always worked closely with IBRA and in the early days with our founder, Dr. Eva Crane. Dr. Shimanuki is proud of this heritage and wants to play a role in not only ensuring our survival but also growth into the next county.

Shim is married to Susan who is, in her own right, an expert beekeeper and honey show judge, well known in the Eastern United States and beyond. All of us look forward to working with our new president and to welcoming him and Mrs. Shimanuki to our Cardiff headquarters sometime during his term of office.

Richard Jones
Bee World

AG FACTS

- Computers are used on 83 percent of America's farms. Nearly 75 percent of today's young farmers have a cellular telephone and nearly 33 percent have access to the Internet, up from 10.5 percent last year.
- The United States has less than 7 percent of the world's land but produces 13 percent of the world's farm commodities.
- Within each kernel of corn lies a yield potential in excess of 600 bushels per acre.
- In 1995, over 2.5 billion pounds of beef was produced, half from beef cows and half from dairy cows.
- Some 22 million American workers produce, process, sell and trade the nation's food and fiber. But only 4.6 million of those people live on farms – slightly less than 2 percent of the total U.S. population.

From Farm Digest

MARKETING NEWS

Secretary of Agriculture Dan Glickman has appointed five members and five alternate members to serve on the National Honey Board.

The following appointees will serve a term beginning immediately and ending March 31, 2001:

Producers representing Region 1: Gene Brandi, Los Banos, CA, member and Roger Stephenson, Delta, UT, alternate.

Producers representing Region 2: Lyle Johnston, Rocky Ford, CO, member and Donald Smoot, Power, MT, alternate.

Producers representing Region 3: Judith Gulleson, Britton, SD, member and Jack Meyer, Jr., Madison, SD, alternate.

Producers representing Region 4: Dale Bauer, Fertile, MN, member and Manley Bigalk, Dresco, IA, alternate.

Handlers: Brent Barkman, Hillsboro, KS, member and Walter Diehnelt, Ashippun, WI, alternate.

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You're familiar with the slogans – "Got milk?" "Beef: It's what's for dinner." "Cotton: The fabric of our lives." "Pork: The other white meat."

Why do growers and commodity group representatives work so hard to establish a national advertising program?

The answer is simple. These programs have been wildly successful.

"This generic advertising took off in the mid-80s with dairy, then beef and pork," says Henry Kinnucan, Auburn agricultural economist. "Now, 75% of all agricultural commodities have a mandatory or voluntary check-off program. They spend $750 million annually on generic advertising."

But the amount spent on commodity advertising is very small in relation to the income generated by these industries, says Kinnucan, who began researching commodity advertising in 1983. The dairy industry spends $100 million yearly on fluid milk advertising whereas consumer expenditures on milk are about $18 billion per year.

Southeast Farm Press

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A recent survey conducted by CDB Research and Consulting in New York has to have U.S. manufacturers smiling. The study found that Americans overwhelmingly feel that products "Made in the U.S.A." are as good or better than products made anywhere else in the world. As a matter of fact, eight out of 10 Americans shared this nationalistic opinion. Only about 25% of the people surveyed felt products out of Asia topped those of the States. Some 24% felt the products out of Western Europe were superior and roughly 19% felt products manufactured in Eastern Europe, Central America and South America were better.

From Incentive Magazine

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Year-to-date assessments through April 30: $1,035,053, down 4% from last year. Domestic $687,922, up 37%. Imports $347,131, down 39%. Imports have been lower in each of the first four months compared to last year.

The Budget Variance Report: April is 4/12 or 33% of the year. The report shows total Administrative (Office) expenses at 36.4% and Total Administrative Expenses at 31.3%. Professional Services shows 53.9% because of the one-time payment for the end-of-year financial audit, which accounts for a little more than half of the amount spent so far. Special Projects, Collections and Software, shows 62.2% because of the new accounting software purchase and installation.

Under Administrative (Federal) expenses, the amount paid for Customs Collection Fees includes fees for both the 1996 and 1997 calendar years. USDA User Fees are being billed at $10,370 per month and the amount paid covers four months, January through April.

In the program areas, 22.4% of the budget for total program expenses has been spent: 22.1% of the budget for Advertising, public Relations and Research has been spent; 23.9% of the budget for Industry Service and Support has been spent.

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Secretary of Agriculture Dan Glickman has appointed 17 members to the National honey Nominations Committee, which nominates individuals for appointment to the Honey Board.

New members are: Stephen Culp, Jonesboro, AR; Robert Kelley, Lakeland, FL; Tracy Hunter, Martinsville, IN; Kathryn Fassbinder, Elgin, IA; Robert Strickler, Pascagoula, MS; Diane Rudebusch, Randolph, NE; M. Lee Gollihugh, Sr., Deming, NM; Bonnie Woodworth, Halliday, ND; David Hackenberg, Lewisburg, PA and Richard Drutchas, Montpelier, BT.

Reappointed members are: Thomas Hamilton, Nampa, ID; L. Rick Sutton, Lancaster, KY; Clifford Hatch, Gill, MA; Grant Stiles, Clark, NJ; John Ambrose, Raleigh, NC; Robert Zahler, Edmonds, WA and Milton Miller, Dubois, WY.

The Honey Board administers an industry-funded national research, promotion and consumer information program to increase U.S. honey consumption and exports. USDA" Agricultural Marketing Service monitors the program.

Beeless Pollination? Soon?

GENETIC ADVANCES CONTINUE

Australian researchers have made a breakthrough in their research aimed at making male plant parts in crops redundant – and dramatically lift grain production around the world.

But a spokesman for the Commonwealth Scientific and Industrial Research Organization (SCSIRO) said beekeepers need not worry because the work is only aimed at specific crops and it is likely to be a long time before the researchers achieve success.

The research program aims to develop plants which can produce seed without sex. It is a 15-year collaboration between CSIRO, the Australian Center for International Agricultural Research (ACIAR), and the International Rice Research Institute (IRRI).

"The normal process of pollen formation and transfer is very sensitive to weather conditions – it cannot be too dry nor too windy and so forth," said Dr. Abed Chaudhury, of CSIRO Plant Industry. "It is estimated that A$400 million is lost in rice production alone around the world each year because of drought-related pollination failure."

In a world-first discovery, CSIRO scientists have found a gene that allows Arabidopsis – a test plant used by scientists because of its rapid life cycle – to bypass the normal pollination process and begin seed formation. This is the crucial first step in developing plants which can produce seed without pollination.

The hunt is now on to find equivalent genes in commercial plants like rice – the world's biggest crop, and the staple diet for billions of people globally.

"In most crop plants, the male parts of the flower transfer pollen to the female parts, prompting the grain to develop," Chaudhury said. "But we are aiming to produce grain without the need for male plant parts."

Plants that do not require pollination for seed-set undergo an alternative, sexless process called apomixis. CSIRO scientists aim to identify the genes involved in apomixis and then use them in pollination-reliant crop species.

"If we can produce commercial crop plants that don't need pollination, the benefits would be enormous in terms of higher yields and more efficient production methods," Chaudhury said.

ACIAR have estimated the minimum likely benefits from the research will be A$7 billion to A$8.6 billion worldwide with the benefit to Australia estimated at A$16 million to A$19 million.

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Gene Gun Blasts New Genes Into Garlic – Garlic plants with traits new to this crop may show up in future home and commercial gardens if Agricultural Research Service (ARS) scientists succeed in applying a system they developed to transfer genes. ARS scientists have taken the first step toward this goal by applying molecular tools developed for transferring genetic traits in other crops, such as corn. They've transferred marker genes via a blast from a gene gun. In their experiments, they moved bacterial genes into garlic. But these genes that only serve as markers to let the researchers know the gene transfer method succeeded. The next step: insert useful genes for traits like virus resistance. This could provide long-term protection against disease in future generations of the crop. ARS scientists say this preliminary work is a first step to introducing useful new traits, such as virus resistance, in garlic and onions.

MI QUEEN

The 1998 Michigan Honey Queen is Melissa Chouinard of Riley, MI. She is the daughter of Matthew and Cheryl Chouinard.

WHERE HAS ALL YOUR MONEY GONE?

The table below will make the proposed federal budget easier to understand. If your gross family income is $70,000 for husband and wife, you both work and have two children, figure on $17,900 for deductions and personal exemptions. Your federal tax bit would be nearly $14,000, counting $9,100 in income taxes and $4,900 in social security and Medicare. Figure more or less depending on income.

	Fiscal '99 Spending (in billions)	Share of Total	Your Share
Social security	$396	22.9%	$3199
Defense	$266	15.3%	$2149
Net Interest on the debt	$242	14.9%	$1955
Medicare (minus premiums paid)	$208	12.9%	$1680
Medicaid	$108	6.2%	$872
Federal pensions	$77	4.4%	$622
Veterans	$43	2.5%	$347
Transportation	$42	2.4%	$339
Education	$31	18%	$250
Housing subsidies	$29	1.7%	$234
Supplemental security income	$28	1.6%	$226
Health research and planning	$27	1.6%	$218
Law enforcement	$26	1.5%	$210
Food stamps	$24	1.4%	$194
Unemployment payments	$24	1.4%	$194
Low-income tax credit	$24	1.4%	$194
Environment and resources	$23	1.3%	$186
Family support	$21	1.2%	$170
Science and space	$18	1.0%	$145
Nutrition programs	$14	0.8%	$113
Int'l, including foreign aid	$14	0.8%	$113
Agriculture	**$11**	**0.6%**	**$89**
Job training	$7	0.4%	$57
Other (Energy, Commerce, etc.)	$30	1.7%	$242
TOTALS (after rounding)	$1.733 trillion	100%	$14,000

Where does the money come from? 46¢ of each dollar of revenues is from individual income taxes. Social security and other payroll taxes account for 34¢. Corporate taxes, 11¢. Excise taxes, 4¢. Other, 5¢.

Half of federal spending recycles money back to individuals . . . social security and Medicare checks, vets' benefits, gov't salaries, etc. That has doubled as a share of the overall budget in the past 30 years.

NEW BEE PEST FOUND IN FL

Laurence Cutts, Chief Apiary Inspector for the FL Department of Agriculture and Consumer Service, reported today that a new exotic pest of honey bees had been discovered in Florida. A sample was submitted by a beekeeper on June 1 which was later identified on June 5, 1998 as being the small hive beetle, *Aethina tumida* (family Nitidulidae).

Cutts reports that the small hive beetle has been found in four operations on the east coast of FL in the Ft. Pierce and St. Lucie area. A delimiting survey is currently being conducted. Plans are being made to quarantine the infested area.

Most of the honey bee colonies from at least one of the known infested operations are currently in Maine for pollination rental. Other colonies from the area have been moved earlier in the year to various locations across the country. It is not yet known whether any beetles were transported with the bees, and if they were transported to other places whether they will survive in cooler areas of the country.

The small hive beetle has killed colonies that were apparently strong in FL. Mr. Cutts described the larvae of this beetle as being the size of the lesser wax moth but looking like a typical beetle larvae with six legs. The larvae apparently feed on a mixture of honey and pollen. In particular, they have been uncapping sealed honey, defecating in the honey and making it unattractive to the bees. Adult beetles are also found in the hive where they are repelled by light and hide in debris on the bottom board and between frames and hive boxes. Colonies have been found with 100's of adult beetles and 1,000's of larvae.

Aethina tumida larvae leave their host colony and burrow into the ground to pupate. Control of this beetle could probably be made while it is out of the hive and in the ground. Pest control products made for killing mole crickets or fire ants (Diazinon) would probably kill this beetle.

The literature reports this beetle as being as destructive as the wax moth where it is widely distributed in tropical and subtropical Africa. Both larval and adult stages cause damage in colonies. However, in Africa there are few beetles reported in strong colonies with the beetle normally attacking weak colonies and stored equipment. The adult beetle is shiny brown to *black* and is about 0.5 cm in length. Fermenting fruit is reported to be attractive to the beetle.

Submitted by I. Barton Smith, Jr., State Apiary Inspector, MD Dept. of Agr.

The 3rd Edition of Pests, Predators and Diseases reports that stored supers of honey are at risk if infested with the larvae. A moderate to heavy infestation can ruin an entire crop by causing honey to ferment. Do not let honey supers sit. Comb storage procedures that protect for wax moth are effective.

OBITUARY

Earl & Josephine Emde

Very Old File Photo

Earl Emde was born August 18, 1911 and passed away March 15, 1998.

Earl's grade school hobby in Southern California became a commercial venture while he was yet a teenager. By the time he was 18, Earl owned a truck and was a full-time apiarist. In 1933, Earl married Josephine Neeley. An active migratory business kept them busy in California and Oregon.

In the 40s Earl heard about vast amounts of sweet clover in the Midwest. It wasn't long before he was driving east with a load of bees. With Iowa as the intended designation, he drove a large circle in the state but didn't find just the right area. Turning west again, all the while looking for a good place to unload, Earl decided to settle in South Sioux City, Nebraska. After unloading and doing some scouting, he hurried back to California for another load.

The warehouse two miles west of South Sioux City, Nebraska on U.S. 20 was Emde headquarters until 1960. Other areas of operation included Burton, Nebraska, Dallas and Timberlake, South Dakota.

The 50s were more comfortable, "settled" years for Earl and the family without the busy pace of migratory beekeeping. Earl was active in the Dakota County Farm Bureau and was a member of the Sioux City Seventh-Day Adventist Church. But eventually, the lure of orange blossom honey production turned Earl's interest to Florida. The Emdes and the bees were on the move again.

In the 60s with three sons, Dave, Mark and Tom, in the business, the operation consisted of 6,000 colonies and expanded to North Dakota. Both daughters, Gail and Jeanne, married and lived in the Nebraska-Iowa area.

In the mid-60s, with each son running his own bee business, Earl and Jo moved to Canada for Summer "retirement" and to start yet another bee business. By this time, Earl had already been operating a queen-rearing operation in Florida as well.

Through the 70s and 80s, Earl and Jo traveled widely, attending Apimondia, and trips to Africa and Central and South America to study Africanized Honey Bees.

Earl's advice was sought after by his queen customers and sons. He was truly a master beekeeper. Earl Emde was a member of Sioux Honey Association for 37 years and was actively interested in keeping bees for more than 70. He received the Pioneer Award from Sioux Honey Association in 1996. Earl Emde was proceeded in death by Josephine, his wife, partner and best friend for 63 years. He is survived by five children: Dave Emde, Apopka, FL; Gail McLafferty, Collegedale, TN; Mark Emde, Dallas, SD; Tome Emde, Apopka, FL; Jeanne Becker, Lincoln, NE. There are 11 grandchildren and seven great-grandchildren.

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Meet David De Jong

Roger Morse

Dr. David De Jong has been working at the University of Sao Paulo in Ribeirao Preto in Brazil for the past 18 years. he was in Florida recently and we had a good opportunity to talk about Africanized honey bees, bee diseases and the management of colonies in that country.

Varroa mites are found in every colony of Africanized honey bees in Brazil, but no one treats for them and they pose no problems for the bees or beekeepers. The maximum *Varroa* infestation rate was about 60 mites per 100 adult worker bees when they were first discovered in Brazil in 1978. However, no colonies died from mites. The infestation rate declined rapidly, and by 1987 there were three mites per 100 bees. Today you find only two to three mites per 100 bees in every colony. In other words, from the very beginning the Africanized bees in Brazil had some degree of natural resistance to *Varroa* mites.

The rapidity with which bees in Brazil became even more resistant to the mites is not difficult to understand. The mites prefer to feed on drone larvae and pupae. Colonies with heavy mite infestations have more drones killed or weakened than do colonies that have some degree of resistance to the mites. It is a simple fact that the more susceptible colonies have fewer drones. As new queens are produced, either through swarming or supersedure, the chances are they will mate with drones from the more resistant colonies and only rarely with drones from heavily infested colonies. Thus, with each mating, resistance increases.

What causes Africanized honey bees to be more resistant than European bees to *Varroa* mites? De Jong says there is no simple answer, but it appears that there are a number of factors working simultaneously. One fact is that Africanized bees develop in slightly less time than do European honey bees and some of the mites do not have time to mature – but Dr. De Jong emphasizes that this is only one of several factors they have researched and it is certainly not the whole answer. Africanized bees are good groomers and have been seen removing *Varroa* mites from each other. The bees bite these mites, often biting off legs and making indentations in their bodies, but this, too, is only one factor. For reasons that are not at all clear, mites have a lower reproduction rate in Brazil than they have in other countries. In addition to these behaviors, there is a suspicion that there are some other physiological factors that play a role. Dr. De Jong has found that climate plays a role in *Varroa* reproduction in both European and Africanized honey bees but this is still under study.

We also talked about American foulbrood (AFB) in South America. AFB has not been found in Brazil though it has been rampant in Argentina since 1989. Dr. De Jong has seen AFB kill colonies of Africanized honey bees in Mexico and El Salvador and there is no indication the Africanized bees are resistant to it.

Argentina has some Africanized bees, but most of the honey bees there are European honey bees that do better in the temperate climate of Argentina. As a result they have great trouble with *Varroa* mites. Argentine beekeepers are forced to use drugs and miticides to control both AFB and *Varroa* in their country because the diseases got out of control before the beekeepers realized they were present.

There are approximately two million colonies producing about 100 million pounds of honey in Brazil. Between 50,000 and 100,000 colonies are rented for pollination, especially for apples and cucurbits in the southern, cooler regions of the country. Some bees are rented throughout Brazil for melon pollination.

Brazil exports only about one percent of its honey crop and is importing some honey from abroad, especially from Argentina, which means that per capita consumption of table honey is not too different from that in the United States. Almost no honey is being used in breakfast cereals, graham crackers or cakes and cookies. However, Dr. De Jong noted that honey-flavored yogurt is popular in Brazil.

More than half of the commercial beekeeping operations in Brazil are migratory, but forklift trucks are expensive, so most colonies are loaded and unloaded by hand. Labor is still relatively inexpensive in Brazil but that is changing rapidly and will soon catch up to the United States.

The management of Africanized honey bees in Brazil is different from that of European bees. Colonies are carefully smoked before they are opened. Hives are usually kept on individual hive stands so that opening a colony does not jar and have an affect on an adjacent colony.

Dr. David De Jong was raised on a dairy farm on Long Island, NY. He attended Cornell University and obtained his Ph.D. there under my direction in 1980. While he was a student he spent six Summers as an apiary inspector for the New York State Department of Agriculture and Markets and thus became thoroughly familiar with honey bee diseases under field conditions as well as in the laboratory. He spent six months at the University of Maryland and went to Brazil in July of 1980 to study *Varroa* mite biology as a result of a grant we had from the National Science Foundation. Under that grant he made a number of contributions to our knowledge of the life history of *Varroa*. When that grant expired, after six years, the Brazilians invited him to become a faculty member at the University of Sao Paulo, where he has been ever since. BC

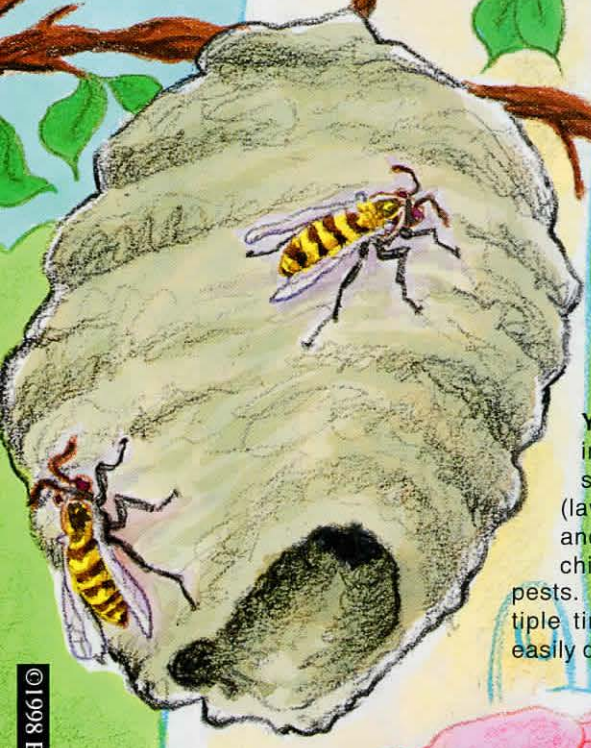
Be Careful . . .

CARPENTER BEE Large, fuzzy, yellow with black abdomen. Bores into and lives in wood and can damage structures. Control when in buildings. **Gentle.**

PAPER WASPS Thin-waisted, elongated, usually black to reddish brown. Long legs. Nests commonly on a stalk. Eats spiders and garden pests. **Non-aggressive, but don't push it.**

BALD FACED HORNET Black and white, shiny, larger than a honey bee. Aggressive, easily provoked. Multiple stings. Large paper nests by late summer, usually in trees. Feeds its young caterpillars and insect pests. Use **Extreme caution when near nests.**

YELLOW JACKET Common stinging insect. Bright yellow and shiny black, smaller than honey bee. Ground nests (lawn mower encounters dangerous) and small aerial nests (trees, eaves, chimneys). Feeds its young garden pests. Aggressive, can sting multiple times. Dangerous and very easily disturbed. **Extreme caution.**



BUMBLE BEE Common. Large, fuzzy, usually yellow and black. Small underground nests. Great pollinators for the garden. **Gentle.**

HONEY BEES The most often encountered 'bee', and the most beneficial. Fuzzy, golden-brown to dark, with stripes. Collects nectar (for honey) and pollen (for food) from many kinds of flowers pollinating them in the process. Can be defensive around nest (hive), use caution.

PROTECT HONEY BEES!