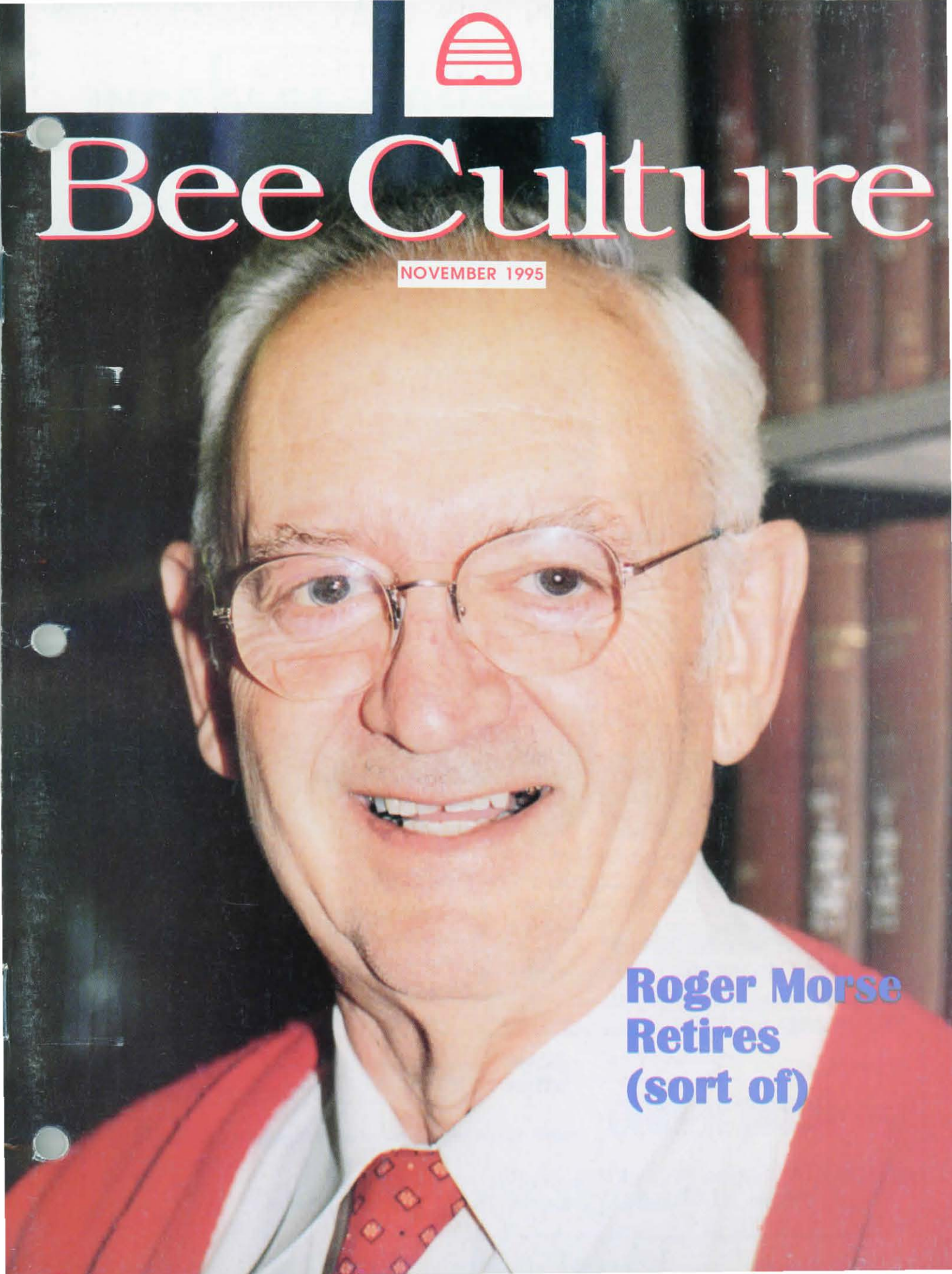


Bee Culture

NOVEMBER 1995

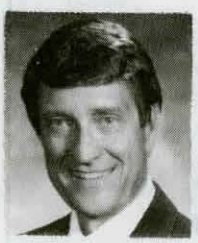
Roger Morse Retires (sort of)

Novem

COLUMNS

DEPARTMENTS

Homeowner's Guide, Pg. 616



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Subscription Rate:
United States, one year, $16.50; two years, $30.00. Newsstand price: $1.95. All other countries, (U.S. Currency only), $9.50 per year additional for postage. Send remittance by money order, bank draft, express money order, or check. Published monthly. Change of Address: Return completed form contained inside issue. Articles are solicited. Opinions expressed by the authors are not necessarily those of the publishers.

ISSN 1071-3190

Advertising
For information on placing display advertisements, contact our Advertising Dept. 1-800-289-7668. Ext. 3220

Postmaster:
Please send form 3579 to: The A.I. Root Co., 623 W. Liberty St., Medina, OH 44256 Tele. 216-725-6677.

Circulation Figures reviewed monthly by Deloitte & Touche, CPAs, and are available on request.

The A.I. Root Co., Publishers 623 W. Liberty Street Medina, Ohio 44256

Second Class Postage Paid at Medina, OH and additional offices.

Bee Culture is Printed on Recycled Paper

VOL 123 ▯ NO 11

ber '95

U.S. HONEY IMPORTS BY COUN

	1990	1991	
			Metric
SOURCE			
Argentina	8,817	9,269	1
China	11,545	20,334	2
Canada	3,454	6,425	
Mexico	7,340	3,559	
NZ	23	13	
Germany	155	113	
Hungary	1,127	1,183	
Poland	20	0	
Australia	1,126	59	
Other	1,348	891	
Total	34,955	41,846	51

Honey Imports, Pg. 623

FEATURES

Cover
Roger Morse, Professor of Apiculture at Cornell University at Ithaca, NY, has been a regular contributor to these pages for nearly 40 years. His column, Research Review is one of the few that makes hard-core research material available to those who can best use it. And, his articles cover the basics of beekeeping. He has published beekeeping books which have helped litterally thousands of beginners avoid the pitfalls of beginning.
Roger has retired, kind of, from his position, but certainly not the limelight of U.S. Beekeeping. Read his story inside.
photo by Marian Hartill

Observation Hives, Pg. 629

Propolis, Pg. 630

Honey Beer, Pg. 637

Antique Gardens; Pg. 642

INNER COVER

On the cover this month, and in the Gleanings section in the back is this magazine's story about Roger Morse. He kind of retired recently, from Cornell, where he's been a professor of Entomology for almost 40 years. You can find out what's been, and what will be with Roger there.

But here, I'd like to tell you what I've always liked about Roger, and what he has done for beekeeping.

The first year I was here I made a trip to New York to visit Richard Taylor and Roger, both columnists for the magazine I was now running. I only knew them from their writings and they didn't know me at all, so it was a first for all of us.

The meeting with Richard went fine, then we all went to Ithaca for lunch with Roger and his army of graduate students. I don't know if Roger remembers, but they didn't let me eat much during that meal because of the questions about my background they kept asking. After lunch I was treated to a short synopsis of the research projects each of those students was pursuing. It was an interesting day.

About a year later Roger and a van-load of his students showed up at the Root Company for a tour and chance to meet the Editor and Publisher of this magazine. He got them around to see the world their research was a part of.

During the years since Roger has influenced those and other grad students in many ways. But one thing stands out besides those trips and presentations and is something we, perhaps even more than those students have benefited from – and that is the articles those students have published here and in other trade journals.

These, coupled with the constant barrage of articles and publications Roger produces, has added a wealth of easily accessed information for everyday beekeepers. To the best of my knowledge, no other Professor has added as much, or influenced as many as Roger. And that is a real big shame.

Hundreds, perhaps thousands of well educated college students have come and gone during that time who have studied some aspect of honey bee biology, beekeeping, honey chemistry and the like, and have never, once bothered to tell anyone but a group of people who *can't* use the information what they learned. Then, they've gone on to careers of producing more students who have done the very same thing. It's a self perpetuating system.

Mark Winston recently discussed the fact that research that doesn't work, doesn't get published, and that, too is a shame. But I think an even bigger waste is that these well educated students are neither required, nor even encouraged to share what they've learned with those who can use it.

The benefit, besides the obvious sharing of information, is that these well educated people would have to learn how to communicate with real people. You know who they are. The ones who pay the taxes that support much of the research that they are doing. The taxes that are used, in the form of grants to pay salaries, tuition, technical and personal support, the trips to conferences and even the beer or two consumed at a local pub. When those grants come from private companies, don't think for a minute that some consumer, somewhere, didn't contribute to that research. They are, I suspect, too often considered an entitlement (I'm smart enough to be here, therefore I *should* get this), rather than an opportunity to share.

There are exceptions, of course. We all know them. They're easy to know because there are so few. But there are so many unknowns, those who come and go and never let us know what they've accomplished.

And although this can be viewed many ways – academic arrogance, (my favorite) indifference or just plain stupidity – it can be blamed (if you choose to use the term, and I do), on the system we (those tax payers I mentioned) have created. We have allowed the arrogance, the indifference and the stupidity to not only exist, but to flourish. We have let those who run the educational system convince us they know more, know best, and

Continued on Page 652

Thanks Roger.

KEEP IN TOUCH

Write: Editor, 623 W. Liberty St., Medina, OH 44256
FAX: 216-725-5624
EMAIL: BCULTURE@AOL.COM

MAILBOX

More Wax Moth Control

This is in response to Richard Taylor's article on wax moth control. I have used this method for 15 years in Missouri, where wax moths are a serious threat four to five months a year, but winters generally kill *most* of these pests. This method may not work in sub-tropical areas with year-round problems.

So, from someone with a lot of experience in this area, let me offer the following refinements:

1. Separate your dark combs with pollen – the moths will get these eventually.
2. Cut hardware cloth into 16" x 20" or 16" x 24" rectangles to go underneath each stack.
3. Place stacks (eight to 10 high) on old pallets – do not stagger supers (unless you want mice damage). Use a queen excluder on top followed by ½" spacer sticks and a lid. I have 4' x 4' fiberglass squares to cover four stacks at a time – thus no building/roof expense.
4. Expect 1-3% comb damage per storage season – more if you don't grade combs. To negate this loss, use plastic foundation.
5. Use alternative methods for brood comb or pollen frame storage until first frost in the fall.
6. Remember, you want maximum light and air circulation for this method to be effective. I successfully stored 500+ supers last year using this method.
7 For late summer storage or dark combs, pile five or six boxes on a hive over an inner cover with bee escape-type hole in it until cool weather arrives. The bees will take care of the moths for you.

Michael Meyer
Springfield, MO

Horse Damage

You have heard that horses will perform tricks for a cube of sugar. They will stand on their noses for a super of honey. The enclosed was a 50 hive apiary in a pasture until the cows were changed out for horses.

John P. Kuchta, Sr.
Lafitte, LA

Farewell

Edward Southwick's farewell salutation (in the October issue of *The American Bee Journal*) touched me very deeply. His serenity and composure show that he is a man who is very certain about his future. I would simply like to say, Godspeed, Ed Southwick, I'll see you later in God's Apiary.

I wrote the enclosed poem last fall and would like to offer it in honor of Mr. Southwick.

Charlie C. Lyon

Season's End

The sun shone warm on that Autumn day,
as the beekeeper checked his hives:
All packed with honey and healthy bees,
Next Spring would find them alive.

His work was done so he stopped to rest,
recollecting the seasons past.
He was tired and old, "Brrr, it's turning cold."
Would this season be his last?

"Will there be honey bees in Heaven?" he mused.
Couldn't be Heaven without flowers:
and fields of clover and goldenrod,
where a beekeeper can spend his hours.

With beehives dressed in a heavenly white.
their honeycombs filled with gold,
and honey bees buzzing the year around,
The weather would never be cold.

I won't need a mansion of silver and gold.
Fine robes are not necessary.
Just give me a shady place I can rest
in a corner of God's Apiary.

Charlie Lyon

ABF Honey Show in Portland

Plans are being made for the American Honey Show, which will be a feature of the American Beekeeping Federation's 1996 covention, Jan. 16-22 at the Red Lion Hotel, Lloyd Center, Portland, OR.

The show will spotlight the finest examples of honey and beeswax. It provides six classes for liquid honey, one for chunk comb honey, two for comb section honey, one for cut comb, one for creamed honey, and two for beeswax

In general the rules call for entries composed of four 1-lb. jars of honey, four comb sections, or a 5-lb. block of beeswax (up to 10 lbs. for the art design beeswax). Detailed rules are available from the ABF Office (P.O. Box 1038, Jesup, GA 31598, ph. or fax: 912-427-8447). Persons not familiar with the show should review the detailed rules before preparing their entries.

A special trophy will be presented for the first place entry in each of the 13 classes. Second and third place entries will receive ribbons. A "Best of the Show" award will be made for the best single entry. Presentations will be made during the ABF business meeting on Saturday, Jan. 20.

Attendance at the convention by the entrants is not necessary. The entries may be shipped to the convention (see rules for instructions), and any awards or ribbons won will be sent to absent entrants.

After being on display for two days, all the entries will be sold at auction with the proceeds benefitting the American Honey Queen Program. Competition in the American Honey Show is restricted to members of the American Beekeeping Federation.

Troy Fore
American Beekeeping Federation

Continued on Next Page

MAILBOX

Hot In NJ

This photo was taken of one of my hives on July 15th here in New Jersey. The temperature that day was about 103°F and the humidity was extremely high.

The Hoffman feeders had been left on after the spring sugar feeding. I was interested in seeing if feeding water would be of a benefit. With the current drought I have been filling the quart jars about every two weeks.

Raymond G. Brandes
Gillette, NJ

Tooth Decay?

After reading the fine piece by Armstrong and Otis, "The Antibacterial properties of Honey," I have one question. Tooth decay. Would eating honey actually help prevent tooth decay and plaque accumulation? Have studies been done on this?

James Tipton
Glade Park, CO

Where Have The Bees Gone?

The song by Peter, Paul and Mary asks, "Where have all the people gone?" We here in St. Bernard Parish, can ask, "Where have all the honey bees gone?" The answer is "They went with the mosquito insect spray." At sundown trucks go about spraying clouds of insect repellent, the only way to overcome our mosquito problem.

Now we have no fruit on the vines, the little sweet pepper plants, no lovely fields of white and red clover.

Now 89 years old, I no longer keep my three colonies of honey bees. Before I check out let me tell the way I took care of that top cover problem on the hives. Instead of the top board I used to put heavy duty aluminum foil over top, under cover. When ready to take off the honey from the shallow super, just open a 1" of the foil at a corner, puff the smoke in, and down go the bees. In a few minutes that super is clear of little folk. I could easily take off the super of honey.

Syrena Lunt
Chalmette, LA

Hive Capture

I am currently a member of the St. Clair County Beekeepers Association in St. Clair County, IL. I am sending you a check for a two-year subscription. I am going on my second year of beekeeping and its been a real experience. Your magazine has helped me a great deal in learning about bees and I am looking forward to getting my next issue already!

I do have a question regarding how to capture a hive of bees that have made their home in a chimney. A friend and I thought it would be a great challenge to see if we could retrieve this hive. We tried, but were unsuccessful.

Thank you for a wonderful magazine and all the help!

Anthony Erwin
Belleville, IL

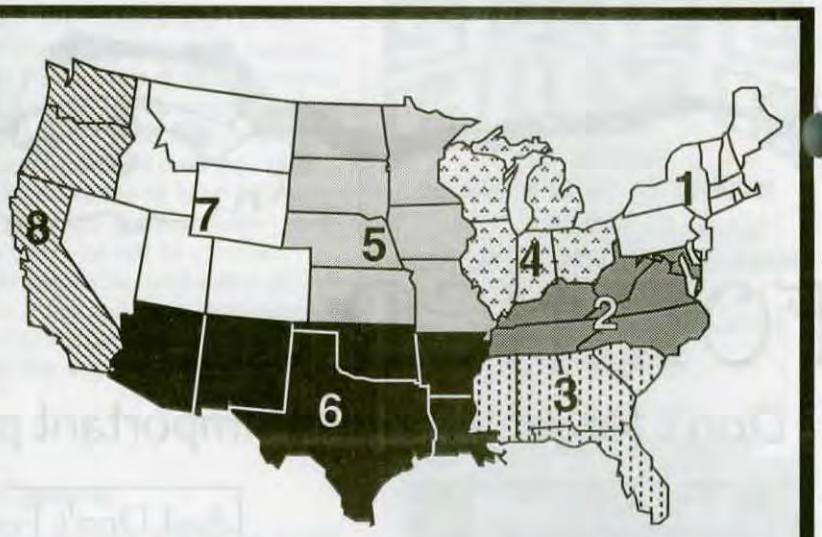
Editor's Note: The full scope of removing bees from a building is covered in many beekeeping books – *ABC & XYZ of Bee Culture*, for example and has been covered in many articles in beekeeping journals. I recommend you check some of these out (includng your state beekeeping specialist) this winter, and get prepared to move those bees next spring – assuming they survive.

NOVEMBER Honey Report

NOVEMBER 1, 1995

REPORT FEATURES

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



	Reporting Regions								Summary		History	
	1	2	3	4	5	6	7	8			Last	Last
Extracted honey sold bulk to Packers or Processors									Range	Avg.	Month	Yr.
Wholesale Bulk												
60# Light	45.61	48.25	40.50	42.00	38.40	42.33	45.00	43.50	38.40-60.00	45.10	44.41	43.00
60# Amber	44.19	47.00	40.80	40.80	37.80	39.37	42.00	41.00	31.80-60.00	42.90	42.47	40.76
55 gal. Light	0.62	0.46	0.70	0.70	0.67	0.54	0.59	0.63	0.46-0.90	0.66	0.62	0.58
55 gal. Amber	0.58	0.49	0.68	0.68	0.64	0.49	0.55	0.60	0.42-0.90	0.61	0.57	0.53
Wholesale - Case Lots												
1/2# 24's	21.72	25.50	19.20	19.20	19.56	22.38	22.85	25.60	18.00-28.50	22.70	22.62	22.92
1# 24's	32.09	33.13	31.87	31.60	33.74	32.43	31.25	33.60	28.80-41.45	33.17	31.96	29.74
2# 12's	29.56	31.20	29.30	28.95	31.76	27.83	30.25	31.41	24.60-38.80	30.83	29.71	29.17
12 oz. Plas. 24's	27.06	29.81	25.20	19.80	26.94	26.58	27.50	26.40	13.20-41.40	28.17	28.11	28.13
5# 6's	31.02	33.50	31.95	31.95	32.76	28.20	29.20	31.50	27.00-41.80	32.45	30.59	**31.27**
Retail Honey Prices												
1/2#	1.32	1.58	1.39	1.09	1.12	1.78	1.18	1.20	0.88-2.00	1.37	1.48	1.45
12 oz. Plastic	1.66	1.85	1.89	1.59	1.54	1.68	1.70	1.54	1.29-2.50	1.71	1.69	1.70
1 lb. Glass	1.90	1.98	2.13	1.82	1.93	2.02	1.90	1.83	1.49-2.75	1.95	2.01	1.93
2 lb. Glass	3.18	3.38	3.28	3.04	3.25	3.20	3.15	3.29	2.49-4.05	3.33	3.24	3.36
3 lb. Glass	4.28	4.37	4.27	3.79	4.24	4.01	4.50	5.38	3.79-6.10	4.48	4.35	4.47
4 lb. Glass	5.44	5.47	5.88	6.26	5.50	5.09	5.25	6.26	4.89-8.15	5.74	5.36	5.75
5 lb. Glass	6.70	7.10	7.39	7.71	7.48	5.08	6.35	6.63	3.10-9.60	7.07	7.20	7.07
1# Cream	2.41	3.23	1.94	1.94	2.08	2.85	2.15	2.08	1.59-4.95	2.44	2.64	2.50
1# Comb	3.27	2.91	3.38	3.75	3.06	4.35	3.75	2.70	1.95-5.00	3.45	3.41	3.16
Round Plastic	2.89	2.75	3.19	3.19	3.19	3.61	3.19	2.50	2.49-4.00	3.07	3.15	3.04
Wax (Light)	1.85	1.43	1.98	2.05	1.70	1.39	1.50	1.80	1.00-4.00	1.88	1.73	1.65
Wax (Dark)	1.20	1.42	1.60	1.85	1.60	0.96	1.40	1.60	0.75-4.00	3.81	1.40	1.31
Poll. Fee/Col.	28.29	20.00	30.50	32.50	29.00	16.00	35.00	32.18	10.00-55.00	29.70	30.00	30.69

MARKET SHARE

We need honey reporters. We need them in every region, but especially in regions 3 and 7. But 4, 5, 6 and 8 need more coverage, too.

If you sell, or have access to most of the products listed here (for instance, bulk and wholesale; or, retail only; or, some combination). We'll send you the form each month, you fill it out and return it to us, postage paid. You need to return at least 10 a year (or try, anyway) so we have some consistency.

Can you help: Contact us. Call 800-289-7668, ex. 3214. If you can help, we'll send you a free subscription, and our gratitude.

Region 1

Prices continue to inch up for nearly every product and size. Demand approaching seasonal peak so supplies should be short after the first of the year. Dry fall helped work, slowed honey. Mites a problem, but cautious optimism prevails.

Region 2

Prices up generally, but some still selling at import prices. Too bad. Retail showing stronger gains than wholesale and bulk, but the latter seems to move around alot. Fall weather tended toward cool and moist, which slowed fall honey, and some fall work. Mites aggressive, with some reports of 75-100% loss. Wait and see attitude prevails.

Region 3

Retail prices taking off, while wholesale and bulk staying about the same. That should change, soon. Demand steady but supply limited as short early crop, and fewer producers make for less honey. Prices will climb. Wet fall helped late flows, but mites raising havoc in untreated colonies. Optimism high for those who take care of business.

Region 4

Prices increasing across the board, albeit a bit slowly, especially at retail. An only-average crop means reduced supply, and demand, especially at the wholesale/bulk level increasing. Prices should continue to climb. A dry fall didn't help crop production.

Region 5

Prices heading up at about the same rate as most places, too slow for some, way too fast for others. A warm, mostly dry fall helped late flows as too-dry weather earlier slowed production. Mite really taking a bite where not treated, but production still a bit above average. Optimism abound, though, as producers see dollars for the first time in years.

Region 6

Retail prices heading up faster than wholesale, not uncommon, but not well understood, either. Demand starting to move up, but only steady supply should bring prices up a bit more. Production steady this year, but late rain helped more than usual. Beekeepers generally optimistic about prices, and mite control.

Region 7

Prices heading up, finally. So-so crop has helped. Enough rain has, too, but winter weather (!) has already shut things down in much of region. Outlook for next year generally sound.

Region 8

Prices and demand rising hand in hand, and supply getting shorter and shorter. It should be an interesting spring when stores run really, really low. AHB still moving in, and the pollination and urban crowd worried about the effect. Mites a real big problem. Outlook promising, but guarded.

NEW ON THE MARKET

A Sip Through Time, A Collection Of Old Brewing Recipes. Cindy Renfrow. 335 pgs. Soft. Illustrated. $22.00. From: Cindy Renfrow, 7 El's Way, Sussex, NJ 07461. (201) 875-3535

This book is a beekeeper's delight for two reasons – it deals with making meads, hydromels and metheglins all with honey. In fact, it has over 400 period brewing recipes for ale, beer, cider, perry, brandy, liqueurs, distilled waters, hypocras, wines, candles, possets and syllabubs. The recipes are all from sources such as Ancient Egypt, Greece, Rome, Medieval Europe and 17th, 18th and 19th century America and Europe. And if this was all, it would be more than enough. But there's more.

There's an appendix of herbs and fruits and dye plants used in making all these recipes, a very comprehensive bibliography and a long list of sources of seeds, books and magazines and historical societies.

If you are a maker of any of these brews, this book should be in your library. And if you're not, you will be after reading it.

Kim Flottum

Beekeepers Programs. Quick Learn, Box 73116 #206-2525, Woodview Dr. SW, Calgary, AB Canada T2W 6E4. Computer programs to determine honey production and a Beekeepers' Quiz.. Requires Windows 3.1 or better an 1MB disk space. $29.95 pp.

This program comes in three parts. The first is a honey calculator. It asks what the current floral source is (New England Fall flowers; Midwest Clover etc.), the weather and the strength of the hive. Given these parameters, it will determine the amount of honey a colony will produce on a given day. Multiply that times the price of honey and the number of colonies you have and you can figure out how much money you made.

The second part is a self administered multiple choice quiz covering several areas of beekeeping. Although fun the first time, there are several overlapping areas and there aren't many questions.

The third part is the icon section. From these you can assign an appropriate icon to any of the programs on your computer. It dresses up your desktop nicely.

An interesting addition to any beekeeper's computer.

Kim Flottum

Homeowners Guide To Safe Honey Bee Swarm Control. 26 min. VHS Video. $30.00 Ag Communications/ Computer Support, University of AZ, 715 N. Park Ave., Tucson, AZ 85719.

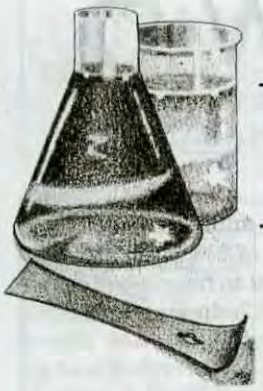
Dr. Eric Erickson has, with the help of other Univ. of AZ staff, put together a 26 minute video dealing with honey bee swarms and homeowners. Arizona does have a resident population of AHB, so this video is especially directed to areas with similar problems. However, the information presented is applicable everywhere honey bees are found.

It does not pretend to make the viewer a beekeeper, which is good. It does give a homeowner the information needed to handle a swarm in the backyard though. It discusses having a beekeeper, or exterminator handle it if possible, but acknowledges this is not always possible. What then?

Then, it shows how to capture a swarm, or how to kill one – definitely a consideration with AHB. But it also shows what kinds of equipment to use – suits, veils, (and how to make them at home), boots and the like. It talks about time of day, using soapy water, returning to clean up and precautions to take.

This video is for every homeowner. Or, every homeowner should see it, along with local fire departments. It is professionally made, short and to the point, with solid information. A must-see, and must-have.

Kim Flottum



RESEARCH REVIEW

roger morse cornell university ithaca ny

"Using extender patties in your colonies, with or without an antibiotic, is beneficial."

Antibiotic extender patties are playing an increasingly important role in honey bee colony management. They were invented in 1970 for American and European foulbrood control by Dr. William Wilson and his colleagues of the U.S. Department of Agriculture. However, two new papers, in part supporting the research of others, indicate that vegetable oil patties aid in the control of tracheal mites and improve colony health where *Varroa* mites are found.

The preferred formula for making vegetable oil patties is one-third of a pound of Crisco (vegetable oil), two-thirds of a pound of finely granulated sugar and two tablespoons of TM-25 (oxytetracycline=Terramycin).

The vegetable oil in the patties is not attractive to honey bees, but since sugar is present, they will eat them, albeit slowly. The slow eating provides a constant, low-level supply of antibiotic that is more effective as a bee disease control agent than when the drug is delivered rapidly.

Effects on tracheal mites

In tests conducted by Calderone and Shimanuki (1995) of the USDA laboratory in Beltsville, MD, four different vegetable oils – peanut, soybean, sunflower and canola were used. These were mixed with finely granulated sugar, using one part oil and two parts sugar by weight. The four oils were about equally effective in reducing tracheal mite populations in honey bee colonies. Antibiotics were not included, though obviously, they could have been added if they were needed.

Effects on *Varroa* mites

The effect of vegetable oil (without antibiotic) on *Varroa* mites was tested by Kraus and Page (1995) of the University of California at Davis, CA. They found that the vegetable oil killed *Varroa* mites in small numbers but did not reduce the *Varroa* population growth. However, treated colonies infested with *Varroa* "had greater average numbers of bees, larger amounts of stored honey and pollen and larger brood areas, compared to control colonies." This indicates a positive effect but does not mean that vegetable oil can be substituted for chemical control of the mites, though it is clearly of value in their control in the United States.

Why do oil patties work in mite control?

I have talked to several people, including some of the authors cited here, about what these studies mean. It is clear that oil patties pose no problem to colony health and are, in fact, beneficial insofar as reducing populations of both species of mites. The use of vegetable oil patties with an antibiotic is approved by the Environmental Protection Agency except that they should not be used during a honey flow when it would be possible to contaminate the honey with a drug. The use of oil patties without an antibiotic is not a registered treatment, and it is not likely that it will be, since an antibiotic is not present.

It is generally agreed that oil patties disrupt the dispersal of tracheal mites, but the vegetable oil may act in other ways as well. It has been suggested that it disrupts mite mating or may even be a repellent. In the case of the *Varroa* mite studies, the vegetable oil was applied to paper placed in the colonies, not as an oil patty. However, we have even less information on why the vegetable oil has such a positive effect with *Varroa*.

Recommendations

Mixing the vegetable oil patties is a tedious job. Many beekeepers have purchased baker's dough-mixing equipment so as to mix the ingredients thoroughly. A single treatment for a normal honey bee colony is a one-half-pound cake, which is placed on a piece of paraffined or other paper and put on the top bars of the frames just above the brood nest.

In the case of both the University's bees and my own bees, I have started using extender patties with antibiotic both spring and fall. A half-pound patty will be consumed by a normal colony in about six weeks. It is still necessary to use Apistan strips to control *Varroa*, as we do not yet have sufficient resistance in our colonies to go without such a treatment. However, it does appear that the patties may reduce the time we must leave Apistan strips in colonies.

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Calderone, N.W. and H. Shimanuki. *Evaluation of four seed-derived oils as controls for* Acarapis woodi *in colonies of* Apis mellifera. Journal of Economic Entomology 88: 805-809. 1995.

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? DO YOU KNOW ?

Bee Breeding & Genetics

clarence collison

Winter is approaching in the more Northern areas of North America, and beekeepers should be thinking of next season. For many, ordering packages and queens is certainly one of the many wintertime tasks that need to be completed before spring. In choosing which bee supplier to order from, it is necessary to think about what traits you desire to have in your bee stock and what is currently available. Selection of the right bees for your operation will require you to think about when your local honey flows occur, wintering conditions for your area and what management problems you have had to deal with the past couple of seasons. In addition, it is important to have some understanding of bee genetics, mating biology and techniques required to have a bee breeding program. This information will help you appreciate what is required in selecting and developing new lines of bees. How well do you understand bee breeding and genetics?

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

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

1. ___ All sperm produced by a drone are genetically identical.
2. ___ Gynandromorphs are individual bees that are part male and part female and are useful in genetic studies.
3. ___ A honey bee colony is composed of a large number of subfamilies of workers.
4. ___ Races of honey bees are much more variable in their characteristics than a breed of domestic animals.
5. ___ During instrumental insemination, semen from the drone(s) is transferred to the spermatheca of the queen.
6. ___ Drones have only daughters, no sons.
7. ___ The largest number of geographic races of the Western honey bee, *Apis mellifera*, are found in the Near East.
8. ___ When two inbred lines of honey bees are crossed, the offspring exhibit inbreeding depression.
9. ___ Gametes (mature reproductive cells; sperm and egg) contain two sets of chromosomes.
10. ___ Workers of _____ can produce other workers and queens from unfertilized eggs.
    A. *Apis mellifera ligustica*
    B. *Apis mellifera caucasica*
    C. *Apis mellifera capensis*
    D. *Apis mellifera mellifera*
    E. *Apis mellifera carnica*
11. ___ Drone honey bees have ___ chromosomes.
    A. 15
    B. 32
    C. 14
    D. 16
    E. 28
12. ___ Worker honey bees that have the same mother but different fathers are half sisters and have _____ of their genes in common by descent.
    A. 25%
    B. 50%
    C. 75%
    D. 100%
    E. 88%
13. ___ Buckfast honey bees are reported to show resistance (lower susceptibility) to:
    A. American foulbrood
    B. Sacbrood
    C. *Varroa* mites
    D. Chalkbrood
    E. Tracheal mites
14. Where was the Buckfast line of honey bees developed? (1 point)
15. Name two ways in which beekeepers attempt to have controlled matings in their selection programs. (2 points).

"Yugo Bees" (ARS-Y-C-1) are a new line of honey bees that recently became available to beekeepers in the United States.

16. What country were they imported from? (1 point)
17. What race of honey bees did they originate from? (1 point)
18. Why were they imported into the United States? (1 point)
19. There are clearly profound differences in life history between temperate and tropical honey bee races. These differences can be largely explained by two major selective forces. Name one of them (1 point).

Select the correct answer. (5 points)

A) Tropical Honey Bees B) Temperate Honey Bees

20. ___ Maintain the largest feral colonies
21. ___ Highest swarming rates
22. ___ Lowest tendency to swarm
23. ___ Exhibit the greatest defensive behavior
24. ___ Show the greatest variation in nesting sites

ANSWERS ON PAGE 650

URBAN BEEKEEPING CAN BE HIGHLY SUCCESSFUL

Bees In The City

mark winston

I know what season it is each year without ever having to look outside, simply by the type of telephone calls I get from residents of Vancouver, British Columbia, where I live and work. My barrage of calls about bees and wasps begins on the first warm day in spring with the predictable "I found a killer bee in my house, what should I do?" The late spring is characterized by "There's a bee nest in my front porch. I heard you study bees and was wondering if you would like to take it away and study it." I know August has arrived when the calls change to "We have a wasp nest on our house, and I hear you study wasps and was wondering if you would like to take it away and study it?" Early September is marked by media calls, each year with the same emphatic question: "This summer was the worst for wasps in anyone's memory. Why were there so many more wasps this year?"

This spring, however, was marked by a different type of call. For the first time, the callers were asking "What's happened to all the bees?" I haven't seen any honey bees in my garden or on my fruit trees and berry bushes. Will they get pollinated this year?" I dismissed the first call or two as nonsense, since this has been our finest spring in many years, but when I kept getting these calls day after day, I finally woke up and realized it was a trend, and perhaps there really was a honey bee shortage in the city.

This has never happened before, because urban beekeeping has been a major backyard presence in Vancouver, as it is in most North American cities. When I moved to my Vancouver home, the 80-year-old gentleman across the street maintained a colony of bees on his flat garage roof, in full view of the street. His neighbor had 10 colonies in his backyard, stocked with swarms he located by leaving his name with our local police and fire departments, who pass on calls about swarms in the neighborhood. Another fellow, living on the busy main street three streets over, maintained three colonies of bees on his second-floor balcony, facing the street. My two backyard colonies barely made a dent in the neighborhood bee population.

Urban beekeeping not only is common, but it can be highly successful. My own backyard colonies produce at least 100 pounds of honey each year, better than our average in beeyards out in the country. One Vancouver beekeeper used to brag about how he maintained 20 colonies on a rooftop in the downtown area, and how each colony produced 400-pound harvests annually. These harvests gave him guru-like status in his local bee club, until everyone realized that his bees were located within a few hundred yards of a sugar-packing facility!

City beekeeping in our region, and probably in yours as well, is regulated by a hodge-podge of bylaws and regulations that differs in each local municipality Vancouver, for instance, prohibits the keeping of bees within the city limits, although the public health officials don't enforce these bylaws unless someone complains. Indeed, there is a very public and obvious Vancouver Bee Club, and both the Municipal Gardens and our Science Museum maintain active bee colonies. Other nearby municipalities allow beekeeping in a properly fenced backyard, as long as the bees don't cause a nuisance, but hiding bees isn't really necessary, no matter what the regulations may be. I can't imagine that the police haven't noticed the flight from the three bee colonies on the front balcony a few streets over from us. No, beekeeping generally is tolerated within the city, and any objections by the neighbors seem to disappear following a gift of a bucket or two of honey.

Managed honey bees in the city provide a major public service by pollinating gardens, fruit trees and berry bushes, and should be encouraged rather than legislated out of existence. Our cities, as groomed and cosmopolitan as they appear, still obey some of the basic rules of nature, and human plantings are no exception. Your home-grown squash, apple trees, raspberries, peas, beans and many other garden crops require bees to move the pollen from one flower to another, no matter how urbanized or sophisticated your home may be. The demise of wild bees, due to pesticide use, nest habitat destruction and vast areas of concrete and asphalt in our

Continued on Next Page

"Managed honey bees in the city provide a major public service by pollinating gardens, fruit trees and berry bushes, and should be encouraged rather than legislated out of existence. Our cities, cosmopolitan as they appear, still obey some of the basic rules of nature, and human plantings are no exception."

CITY ... Cont. From Pg. 621

cities, has made backyard gardens even more dependent on managed pollinators than in many agricultural areas, and any problem with urban beekeeping resonates through our backyards by diminishing pollination.

The apparent decrease in Vancouver honey bees that I'm surmising from all these phone calls probably was due to tracheal mites and *Varroa*. Beekeepers in my region were hit hard by the arrival of *Varroa* mites two years ago, in addition to the already-present tracheal mites. The Ministry of Agriculture reported a 66 percent loss in bee colonies that first season, and there was a tremendous shortage of bees for pollination in the agricultural regions of the nearby Fraser Valley. The impact of these mites has been most severe on hobby beekeepers, many of whom are not involved in organized bee clubs, don't get bee journals and newsletters, and are largely unaware of the management necessary to prevent mite damage to colonies. Further, even the more aware hobbyists don't always have the resources, time or interest to perform the intensive treatments necessary to manage bees in today's mite-infested bee world. No, I think the drop in honey bee numbers reported from these phone calls is a real one, and does not bode well for gardening and plantings within urban environments.

North American urban beekeepers are beginning to confront another "pest" that will curtail beekeeping in the city, the Africanized bee. These bees are not compatible with urban beekeeping and should be kept a good distance from people, pets, homes, schools, roads, and the like. While city beekeeping would still be possible in the post-Africanized world by maintaining colonies with European queens, I expect to see a real reduction in urban beekeeping as the Africanized bees spread. Indeed, stricter enforcement of municipal bylaws, outright bans on bees in some cases, fear of legal action following a stinging incident, and lack of knowledge by urban hobby beekeepers about how to keep colonies non-Africanized all will conspire to reduce managed bee populations in urban environments. Even here in Canada, where Africanized bees are unlikely to ever arrive, municipalities have been tightening their rules about beekeeping in response to news reports about Africanized bees from the Southern United States.

Another threat to urban beekeeping is pollution. Bees are notorious for being able to concentrate pollutants in their honey, largely because many pollutants wind up in floral nectar before the bees collect it. Plants that breathe in airborne pollutants, or take up water-borne substances through their roots, tend to concentrate these compounds in their flowers, leading to high levels of pollutants in nectar. Airborne substances also get trapped in beehives by the waxy comb and sticky honey, and are easily carried by bees themselves on their hair. Bees located near highways, or foraging on flowers along heavily travelled roadsides, may be especially guilty of concentrating pollutants.

Pesticides are another problem for city bees, just as they are for country bees. We had a bee kill in one of our backyard colonies a few years ago that we discovered by the large numbers of twitching, dying bees at the colony entrance. I had the bees analyzed by our Ministry of Agriculture, and they tested positive for diazinon, a pesticide that is used frequently by backyard gardeners. Interestingly, only one of our two colonies was affected, likely because those bees were foraging in an area where blooming plants had been sprayed, while the other colony was not foraging in the same locale. There is little that a beekeeper can do to protect colonies from backyard pesticide use, since there may be hundreds or thousands of homes within foraging distance of an urban bee colony.

A final threat to urban beekeeping is an angry neighbor, but it is rarely stinging that upsets nearby residents. No, the worst complaints about backyard bees are due to those orange fecal droppings that fall on freshly washed cars or newly painted porches. I also know spring has arrived by the annual round of calls from city officials who are attempting to mediate between an irate citizen complaining about bee feces and the beekeeper. Most of these problems can be easily solved by relocating the bees somewhere else on the property, or sometimes just by offering to wash your neighbor's car every week or two during the spring.

When I finally get away from my phone, and get the chance to go outside with my bees, I rediscover the greatest joy of backyard beekeeping. My neighbors, rather than feeling threatened by our neighborhood beekeeping, have been intensely curious, and we have had many conversations over the fence that began with bee talk and ended with our becoming much better acquainted. Neighbors do occasionally fall out over bees, but more often, bees bring people together.

Backyard beekeeping is a great conversation starter, but also reminds us that, no matter how urbanized we have become, nature still flows and flies in the city. It will be a great loss for all urban dwellers, not just beekeepers, if mites, Africanized bees, pesticides and pollution drive bees out of the city. There is a little bit of farmer and country dweller in even the most urbane city resident, and bees in the city are an important timekeeper of the seasons that flow on outside of the concrete, skyscrapers and freeways that dominate our urban landscapes. BC

"Backyard beekeeping is a great conversation starter, but also reminds us that, no matter how urbanized we have become, nature still flows and flies in the city. It will be a great loss if . . . these problems drive bees out of the city."

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

U.S. HONEY IMPORTS
A Global Perspective

john parker

A pivotal point in the history of the U.S. honey industry was the year 1993, when imports reached a peak of 60,617 tons valued at $55.6 million. Most of this increase came from China, which rose 27.8 percent in 1993 to 27,251 tons, with a value of $24.8 million. China's share of honey consumption in the United States rose from 8.5 percent in 1990 to an alarming 23.9 percent in 1993, and was viewed as a major reason for declining prices for U.S. honey producers. The average (retail and wholesale) price reported for U.S. honey producers declined steadily from 55.6 cents per pound in 1991 to 55 cents in 1992, 54.4 cents in 1993, and less than 54 cents in 1994. Wholesale prices were in the 40 to 45 cent range.

By 1995 changes in world honey production and trade caused prices to rise because the world's total harvest will decline about five percent at the same time.

Imports of honey into the United States nearly doubled between 1990 and 1993. However, they declined eight percent in 1994, followed by a 24 percent decline in the first half of 1995. Moreover, demand for honey has increased in the U.S. slightly in recent years, despite reduced government deliveries to institutional outlets. Government procurement of honey fluctuated in the past, depending on laws and plans for honey programs. Because of high price support rates from the early to mid-1980s, producers found it more profitable to forfeit their honey to the government than to sell it at market prices. At the same time, industrial users found it more profitable to increase their use of less expensive imported honey. Then, the 1985 Farm Act legislated lower domestic prices which were more competitive with imports. This caused imports to decline during 1986-1988, and use of domestic honey rose to record levels.

Imports accounted for about 44 percent of total domestic disposition of 138,000 tons of honey in 1993, still below the best year for honey demand, which peaked at 145,600 tons in 1987 which included wide government collection of honey that was forfeited in the loan program. Not surprisingly, only 18 percent of the U.S. honey supply was imported that year. Per capita consumption of honey was stable in the range of 1.2 pounds annually in the early 1990s, compared with the peak of 1.32 pounds in 1987 Honey consumption in 1995 may surpass the 1987 level.

World Production

Total world production of honey reached a peak of about 1.2 million tons in 1993, but declined to 1.15 million tons by 1994, according to the Food and Agriculture Organization in Rome, Italy. (To obtain this data FAO sends questionnaires to all countries regarding recent agricultural commodity production. If not answered, FAO economists make estimates for production. Participation is usually fairly high.)

From the survey, it seems world honey production in 1995 will probably decline to less than 1.1 million tons, which has already been reflected through rising prices for honey entering world trade.

Decreased honey production in Argentina during 1995 had a significant impact on world prices because Argentina exports about 95 percent of its honey output. The leading world producers of honey in 1994 were: China, United States, Mexico, Argentina, Ukraine, Turkey, Russia, India and Belarus.

Because of decades of subsidies, per capita production of honey is very high for the 10 million people of

Continued on Page 625

WORLD HONEY PRODUCTION, 1992-94

Producer	1992	1993	1994
		metric tons	
China	183,175	180,895	191,100
U.S.	100,056	104,686	98,500
Mexico	63,886	61,973	62,683
Argentina	52,500	56,000	62,400
Canada	30,339	30,901	33,000
Turkey	60,319	59,207	60,000
Spain	23,958	26,500	26,400
Germany	24,599	25,319	23,300
France	17,183	17,422	18,000
Russian Federation	47,000	5,000	55,000
Ukraine	57,111	63,678	62,050
Belarus	55,000	53,000	50,000
Hungary	10,742	15,873	23,651
Poland	12,891	10,728	9,296
India	51,000	51,000	51,100
Australia	18,948	22,556	22,600
Other	363,521	407,111	298,902
Total	**1,172,228**	**1,191,849**	**1,147,982**

Source: FAO, Agrostat

U.S. HONEY IMPORTS BY COUNTY, 1990-94; JANUARY-JUNE, 1994, 1995

	1990	1991	1992	1993	1994	Jan-June 1994	Jan-June 1995
SOURCE		Metric Tons					
Argentina	8,817	9,269	14,129	16,338	18,302	11,057	8,787
China	11,545	20,334	27,251	34,826	29,334	14,349	6,784
Canada	3,454	6,425	7,624	5,431	4,648	1,660	4,921
Mexico	7,340	3,559	2,169	2,160	2,404	1,609	1,664
NZ	23	13	77	70	59	23	45
Germany	155	113	94	98	98	39	39
Hungary	1,127	1,183	1	28	2	0	4
Poland	20	0	2	36	11	4	2
Australia	1,126	59	12	1,134	593	504	12
Other	1,348	891	636	496	445	310	163
Total	**34,955**	**41,846**	**51,995**	**60,617**	**55,896**	**29,555**	**22,421**
VALUE		Thousand Dollars					
Argentina	$7,019	$8,544	$13,159	$14,458	$15,029	$9,028	$8,442
China	8,781	16,602	22,179	24,837	19,661	9,194	5,051
Canada	4,620	8,781	9,998	7,793	7,136	2,782	6,688
Mexico	6,007	3,012	1,903	1,983	1,952	1,293	1,712
NZ	81	58	156	165	159	72	139
Germany	271	297	290	262	290	116	121
Hungary	822	911	6	51	2	0	9
Poland	32	0	5	73	12	8	4
Australia	891	77	36	939	481	393	30
Other	1,769	1,549	1,152	994	910	578	410
Total	**$30,293**	**$39,831**	**$48,884**	**$51,555**	**$45,632**	**$23,464**	**$22,606**
AVERAGE PRICE		Dollars / Metric Ton					
Argentina	$ 796.08	$921.78	$931.35	$884.93	$821.17	$816.50	$960.74
China	760.59	816.47	813.88	713.17	670.25	640.74	744.55
Canada	1,337.58	1,366.69	1,311.39	1,434.91	1,535.28	1,675.90	1,359.07
Mexico	818.39	846.31	877.36	918.06	811.98	803.60	1,028.85
NZ	3,521.74	4,461.54	2,025.97	2,357.14	2,694.92	3,130.43	3,088.89
Germany	1,748.39	2,628.32	3,085.11	2,673.47	2,959.18	2,974.36	3,102.56
Hungary	729.37	770.08	6,000.00	1,821.43	1,000.00	NA	2,250.00
Poland	1,600.00	NA	2,500.00	2,027.78	1,090.91	2,000.00	2,000.00
Australia	791.30	1,305.08	3,000.00	828.04	811.13	779.76	2,500.00
Other	1,312.31	1,738.50	1,811.32	2,004.03	2,044.94	1,864.52	2,515.34
Average Price	**$866.63**	**$951.85**	**$940.17**	**$850.50**	**$816.37**	**$793.91**	**$1008.25**

NA Not Applicable

Source: Bureau of the Census

THE ITC AGREEMENT

In October, 1993, the Clinton administration requested that the International Trade Commission (ITC) conduct a section 406 investigation on imports of honey at low prices from China. The average price of honey imported from China declined from $816.47 per metric ton in 1991 to $713.17 by 1993 and reached a low of $640.74 in the first half of 1994. Under section 406 of the Trade Act of 1974, the president has the authority to impose import relief measures on products from communist countries when the ITC determines that such imports disrupt the domestic market. This is defined to exist when imports of a like or directly competitive product are increasing so rapidly that they are a significant cause of material injury or a threat of future injury to a domestic industry.

It is interesting to note that honey producers have indicated that a price support program would not be needed if imports were regulated to achieve a domestic honey price which would allow a favorable return. The current situation of lower production in some major honey-producing countries like Argentina may not last. Producers wonder what will happen to honey prices in 1996 if Argentina and Australia have a rebound of production – and exports – and China continues to export about half its output. But as China diverts more exports to Germany, Japan, Russia and the Mideast, it is likely to make smaller deliveries to U.S. importers in the near future and to comply with the agreement worked out with the International Trade Commission.

Belarus, a republic of the former Soviet Union. In fact 1990, U.S. imports of honey from the former Soviet Un reached 298 tons or 0.8 percent of total imports. I after political changes in Moscow in December 1991 a the shift to a free market, Russian output of honey clined. Loss of subsidies and uncertainty in market guarantees contributed to the decline. As a result, R sia switched from a significant honey exporter to a importer, with substantial imports from China and Hu gary.

In fact, most of the smaller suppliers of U.S. hor imports have reduced deliveries, and some have quit co pletely. Hungary was the fifth major source of U.S. hor imports in 1991 with 1,183 tons, but during 1992-19 the country was only a token supplier, the reason be that Hungary has been able to export all available su plies of honey to customers in Europe and the Midea Guatemala ceased deliveries of honey to the United Sta altogether after 1993 because the invasion of Afric ized honey bees reduced both honey production a quality.

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Exports & Percent World Share 1991-1993 by Country

Exporter	1991	1992	1993	1991	1992	1993
	Metric Tons			Thousand Dollars		
China	70032	91756	96597	$66486	$84353	$73448
Argentina	47305	55135	54999	42923	51768	50157
Canada	10259	11137	8275	14228	14650	11601
Mexico	50089	36093	35998	47750	36974	33648
USA	4800	4821	4196	7093	7239	6417
Hungary	12000	7525	13566	14107	11280	14791
Other	85469	82301	84801	132474	139600	115274
World	**279954**	**288798**	**298432**	**$325061**	**$345864**	**$305336**
	Market Share			Percent		
China	25.0	31.8	32.4	20.5%	24.4%	24.1%
Argentina	16.9	19.1	18.4	13.2	15.0	16.4
Canada	3.7	3.9	2.8	4.4	4.2	3.8
Mexico	17.9	12.5	12.1	14.7	10.7	11.2
USA	1.7	1.7	1.4	2.2	2.1	2.1
Hungary	4.3	2.6	4.5	4.3	3.3	4.8
Other	30.5	28.5	28.4	40.8	40.4	37.8
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Source FAO Agrostat, Rome, Italy

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It is interesting to note that honey producers have indicated that a price support program would not be needed if imports were regulated to achieve a domestic honey price which would allow a favorable return. The current situation of lower production in some major honey-producing countries like Argentina may not last. Producers wonder what will happen to honey prices in 1996 if Argentina and Australia have a rebound of production – and exports – and China continues to export about half its output. But as China diverts more exports to Germany, Japan, Russia and the Mideast, it is likely to make smaller deliveries to U.S. importers in the near future and to comply with the agreement worked out with the International Trade Commission.

Belarus, a republic of the former Soviet Union. In fact, in 1990, U.S. imports of honey from the former Soviet Union reached 298 tons or 0.8 percent of total imports. But after political changes in Moscow in December 1991 and the shift to a free market, Russian output of honey declined. Loss of subsidies and uncertainty in marketing guarantees contributed to the decline. As a result, Russia switched from a significant honey exporter to a net importer, with substantial imports from China and Hungary.

In fact, most of the smaller suppliers of U.S. honey imports have reduced deliveries, and some have quit completely. Hungary was the fifth major source of U.S. honey imports in 1991 with 1,183 tons, but during 1992-1994, the country was only a token supplier, the reason being that Hungary has been able to export all available supplies of honey to customers in Europe and the Mideast. Guatemala ceased deliveries of honey to the United States altogether after 1993 because the invasion of Africanized honey bees reduced both honey production and quality.

Australia was the fifth major supplier of U.S. honey imports in 1993 and 1994, but drought reduced deliveries to a token level in early 1995. Australia usually exports close to half its output, and lower production means smaller exports from Australia to Europe and Japan, thus putting an upward pressure on world honey prices. Deliveries of bulk honey account for most of Australia's honey exports, although some shipments consist of small, consumer-ready packages at higher prices. This caused the average price for U.S. imports of honey from Australia to rise from $794 per ton in January-June 1994, when most deliveries were in bulk, to $2,500 per ton in the first half of 1995. Total imports during this period were only 12 tons of honey in attractive packaging, skewing the data.

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Mexico	17.9	12.5	12.1	14.7	10.7	11.2
USA	1.7	1.7	1.4	2.2	2.1	2.1
Hungary	4.3	2.6	4.5	4.3	3.3	4.8
Other	30.5	28.5	28.4	40.8	40.4	37.8
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Source FAO Agrostat, Rome, Italy

ANNUAL AVERAGE EXPORT PRICES BY COUNTRY 1991-93

Exporter	1991	1992	1993
	Dollars Per Metric Ton		
China	949.37	319.32	760.35
Argentina	907.37	938.42	911.96
Canada	1386.88	1315.44	1404.93
Mexico	953.30	1024.41	934.72
USA	1477 71	1501.56	1529.31
Hungary	1175.58	1499.00	1090.30
Other	1549.97	1696.21	1359.35
World	**1161.12**	**1197.60**	**1023.13**

Source: FAO Agrostat, Rome, Italy

Four countries (China, Argentina, Canada and Mexico) provided 95 percent of U.S. honey in 1993 and 1994, and it appears the same situation will prevail in 1995. Most of the honey from these suppliers is in bulk form. It is blended by processors and repackaged by U.S. firms for sale to consumers.

Complaints about the influx of honey from China at low prices in the early 1990s eventually led to actions which contributed to less imported product in the first half of 1995. The concern over China's role in depressing U.S. domestic honey prices reached a peak in 1993 and led to legal and diplomatic actions, and the recent agreement limiting China's deliveries of honey to the United States to prevent market disruption.

Because of this, honey imports in the first half of 1995 declined to 22,421 metric tons, but the decreased imports from China caused the average price to rise to $1,008.25 per ton, up from $793.91 per ton in January-June of 1994. Even the price for honey imported from China was up, rising about 16 percent to $744.55 per ton in January-June 1995. Imports from China in the first half of 1995 were 6,784 tons, down 53 percent from the same period in 1994. In June 1995, U.S. imports of honey from China temporarily were down to only 1 ton, compared with 1,688 tons in June 1994.

It is ironic that China is the world's third largest consumer of honey, after the United States and Germany, although it ranks first in exports. Average honey consumption in the United States during 1993-1995 is likely to average about 138,000 tons, compared with about 104,000 tons in Germany and 100,000 tons in China.

At the same time that imports were increasing federal budget reductions and scheduled elimination of subsidies and beneficial price supports for honey producers were occurring. The free trade policy in Washington left producers at the mercy of unusually aggressive foreign competition in their home market. Programs by the National Honey Board were designed to bolster per capita consumption of honey, and in the early 1990s, it appeared that much of their success provided benefit to imported Chinese honey.

The U.S. Congress' high priority to cut both the federal budget deficit and subsidies for domestic honey led to the Government Reform and Savings Act (GRSA) of 1993, which contained legislation for the 1994 and 1995 honey crops. It made loans recourse, eliminated subsidies and reduced the loan rate to 44 cents per pound, after the guarantee had been 60 cents per pound in much of the 1980s. The 1995 Farm Bill could extend GRSA provisions to the 1996-2000 honey crops. To maintain no federal net expenditures for the honey program, it appears that any assessments will be used to cover administrative costs for running a honey program.

At first the complaints from U.S. producers about sagging prices blamed partly on rising imports from China were quieted by the Clinton administration with a promise that they would monitor imports from China. This was viewed as a continuation of the green light by China's exporters. China has done very well in expanding exports of a wide range of products to the United States in the last five years. Honey being only one of the hundreds of products to show spectacular growth between 1990 and 1993. During this period, U.S. imports of honey from China tripled, and the Chinese now have a trade surplus of about $20 billion annually with the United States.

It appeared that if this pace continued, it would mean a severe contraction for U.S. honey production. China's expanding deliveries also meant that U.S. importers did not suffer from a reduction of Mexico's honey deliveries from 7,340 tons in 1990 to only 2,160 tons in 1993, (primarily due to AHB problems). China's deliveries of honey to the United States increased 76 percent to 20,334 tons in 1991, doubling its share of the U.S. honey market, to about 15 percent. This growth, followed by further gains in 1992 and 1993, led to the official diplomatic activity that occurred this year. (See box.)

Moreover, China's total honey exports to the world increased from 70,032 tons in 1991 to 91,756 tons in 1992, when the value peaked at $84.4 million. Although Chinese honey exports rose to 96,597 tons in 1993, reduced prices caused the value to decline one-eighth to $74.5 million. The United States accounted for about a third of China's total honey exports in 1993. Then, as China shifted some honey deliveries to other markets, the U.S. share of its exports declined about 10 percent in 1994. They will however, decline significantly again in 1995.

Since the U.S. is still a net importer of honey it requires product from somewhere to fill that need. Recently, imports from Argentina declined 20 percent to 8,787 tons in the first half of 1995, mostly because of lower Argentine production. Before the 1995 setback, U.S. imports of Argentine honey had increased steadily from 8,817 tons in 1990 to 18,302 tons in 1994. Argentina usually exports more honey to Germany than to the United States.

However, Canada stepped in as the major supplier this year, filling some of the gap left by the decline in China's deliveries of honey to U.S. traders. U.S. imports of honey from Canada tripled in January-June 1995, reaching 4,921 tons. Previously, Canada's deliveries of honey to the United States peaked at 7,624 tons in 1992, declined 28.8 percent to 5,431 tons in 1993, and further retreated 14.4 percent in 1994. Now it appears that U.S. imports of honey from Canada may reach a new peak in 1995, possibly in the range of 10,000 tons. This means that close to a third of Canada's honey production will be exported to the United States this year. Also, Canada's production has increased in recent years, making avail-

able surplus product. It remains to be seen what will occur in late 1995, as predictions of Canada's crop have only been average.

The average U.S. import price for honey from Canada is usually about double that for China's honey. The price for U.S. honey imports from Canada ranged between $1,311 and $1,367 per ton during 1990-1992, and rose to $1,535.28 per ton in 1994. The opportunity to increase sales caused Canada to reduce prices by 19 percent in the first half of 1995 to an average of $1,359.07 per ton.

But, despite problems from Africanized honey bees and drought Mexico remains the fourth major supplier of U.S. honey imports, which were steady in the first half of 1995 at 1,664 tons. However, the average price was up 28 percent to $1,028.85 per ton. Mexico's deliveries of honey to U.S. importers in 1994 were 2,404 tons, only a third of the 7,340 tons delivered in 1990.

Small U.S. imports of packaged honey at higher prices come from some countries, particularly Germany, Switzerland and New Zealand. Germany is the leading world trader in honey, both bulk and packaged. In 1994, its honey imports were about double the quantity imported by the United States. However, a considerable part of this is packaged in attractive containers and distributed to customers in other countries, mostly in Europe and the Mideast.

U.S. imports of honey from Germany declined from 155 tons in 1990 to 98 tons in 1993, and remained steady in 1994 and early 1995. The average price for U.S. imports of honey from Germany increased from $1,748 per ton in 1990 to $3,085 in 1993, and rose to $3,103 in the first half of 1995.

Two other countries prepare their domestic honey in small attractive packaging for marketing in the United States. They are Switzerland and New Zealand. Special brands of honey from the Swiss Alps are probably the most expensive U.S. honey imports. Deliveries of honey from New Zealand have remained small, during the same period, and have little affect on the market.

About 15 percent of the honey consumption in the United States occurs outside the home, in places served by the food service industry. This includes restaurants, schools, hospitals and other institutional operations. Industrial honey, on the other hand, accounts for about 45 percent of total consumption in the United States. Packers supply most of the industrial honey for the food manufacturing industry, particularly bakery, health food and breakfast cereal manufacturers.

Where May U.S. Honey Imports Come From In 1996?

If China's honey deliveries to world markets decline further in 1996, where will importers find extra honey? Argentine honey deliveries may rebound if the weather allows a larger 1995/1996 harvest. Canada is likely to further increase deliveries in 1996, but at a slower pace than in 1995.

Eastern Europe had an increase in 1995 production because of good weather, and some increase in exports by Hungary, Czech Republic and Romania may occur in 1996. Belarus and Ukraine may be able to improve their marketing techniques through emerging private market systems. Their major customer in 1995 and 1996 is likely to be Russia, which was previously an exporter. Russia is increasing imports of honey and is not expected to be a likely source for U.S. honey imports in 1996. Vietnam emerged as a beginning supplier of U.S. honey imports in January-June 1995, with the delivery of 20 tons. Yet, its production is not large, and exports would not be sufficient to replace those by the traditionally important exporters.

German traders have considerable stocks of honey. Most of it is imported and in bulk containers. Germany exports primarily packaged consumer-ready honey at relatively high prices. This would be a source for gourmet shops in the United States, but not for the processors providing honey at reasonable prices to wholesalers and retailers. And, the drought in Australia appears to be abating, and production and exports should pick up from there soon.

All in all, there is enough honey produced in the world to meet the demand, but without the major input from China, it appears that prices will continue to be high.

This, coupled with only an average U.S. crop, should maintain a profitable price for U.S. honey producers for 1995, and perhaps beyond. However, a significantly larger world crop next year, with or without China's help, could level the playing field all over again.

U.S. Exports

U.S. honey exports declined from 5,639 metric tons in 1990 to 3,874 tons in 1993 and remained steady in 1994. Only about four percent of U.S. honey production has been exported in the last several years. Most of the exports are in consumer-ready containers. Exports to Japan nearly doubled in 1994, reaching 389 tons, a result of considerable advertising and market promotion. Exports to Canada were steady in recent years, in the range of 359 to 443 tons annually. Mexico emerged as a new market in the early 1990's, and purchased 115 tons in 1994.

Exports of U.S. honey to Sweden reached 583 tons in 1994, double the 1993 level. However, exports to Saudi Arabia declined from 1,080 tons in 1990 to only 304 tons in 1994. Exports to United Arab Emirates reached a peak of 822 tons in 1993, but declined to 353 tons in 1994. Prospects for U.S. honey exports in late 1995 appear moderately favorable, although competition from Germany, and certainly China hamper exports to Europe and the Mideast.

Summary

The policy change in the U.S. honey program, coupled with both the aggressive nature of China's export program and the variability of world production have permanently changed the world honey market. Even with the restrictions on entry into the U.S. of Chinese honey the term 'Global Market' has come to mean much more to the average U.S. beekeeper.

To be successful, an eye must be kept not only on world production, but policy changes both here and abroad. Selling honey, like any agricultural commodity, has become a volatile and dynamic enterprise. BC

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OBSERVATION HIVES

THE BASICS

dewey caron

thomas webster

The observation hive must be the best way to bring bees to non-beekeepers. People who might be terrified of bees can watch them closely without any chance of being stung. An observation hive on display in a public location is often more attractive than other exhibits because it includes live creatures in tremendously diverse activity.

Following are guidelines for this type of display. We review observation hives that have been up and running for several years now, to illustrate typical opportunities and problems. Wildlife sanctuaries, 4-H camps, libraries and museums are all choice locations. A room that is heated and air conditioned, and with many visitors, is perfect.

Basics

Make sure the hive is attractive: Paint or stain the wood parts. Remove dead bees and chalkbrood mummies if the bees are not doing it themselves. Remember that the hive is an "embassy" to the non-beekeeping world. Find a well lighted spot that everyone will see when they come into the room.

Make the hive accident-proof. Bolt the base of the hive to a table or solid support. Make a note of where the hive entrance is. Be sure there is little or no public access to the area outdoors near the hive entrance.

Find a hive maintenance area. Occasionally you will want to have a place nearby to open the hive. This is where you will add or remove frames of bees and clean the hive of debris. It should be away from non-beekeepers and convenient to you. Ideally, this is just outside the hive entrance, so that straggler bees left behind when you're done will quickly find their way back to the hive.

Make the bees accessible

Train the people who work at the location. Those who run the camps, museums and sanctuaries are in the business of educating people. They generally know little or nothing about bees but are intensely curious. Find the most intelligent and enthusiastic person there and take as much time as possible to point out the details. Check back with them frequently and show them something new each time.

Post written information. A bulletin board near the hive is a great way to explain some of what is happening. Often, those who "host" the hive will be happy to have it printed up. You may want to invite questions from visitors, and post the answers for them to see when they return.

Use props. A flashlight and magnifying glass are always useful. Ask your hosts to supply these items.

Find those future beekeepers. There are a surprising number of people out there who have always wanted to keep bees but don't know how to get started. Post the time and location of the next meeting of your local association. And it doesn't hurt to let people know who's selling honey in the area.

Work with others in the area. County extension agents, scout and 4-H leaders, other beekeepers, and teachers may be interested in using the hive. Other beekeepers can help with maintenance chores.

Problems

Jail breaks. Let someone in charge know what to do if bees escape into the room — turn out the lights, and catch the bees when they fly up to the window. The bees will be disoriented, not aggressive, if they escape. An insect net can be helpful (can be purchased from BioQuip Products, 17803 LaSalle Ave., Gardena, CA 90248-3602, (310) 324-0620).

Bees can sting through the feeder screen. Many designs (see Part 1, Jan.) include a feeder location which is covered with wire screen. This is also a place where children like to put their fingers. Build a barrier around the feeder so visitors can't reach this spot.

Use problems as opportunities to educate others: Mites, diseases and swarming are familiar to us but not to the rest of the world. If the hive is having problems, that is interesting and educational, too.

Working observation hives

Six observation hives are up and running in Kentucky where one of us (Webster) has been monitoring them. Here are a few highlights.

One hive has been in use at a 4-H camp for the past five years. Approximately 7800 children visit the camp each year. In a typical week, 400 will run through exercises at the hive. The camp director and assistants have used many of the ideas presented in this series of articles. All of the kids want to come close to the hive, after a little hesitation. Only three stinging incidents have been noted near the hive. Two were stung while touching the feeder screen, and one occurred outdoors shortly after the lawn was mowed. Water sources provided near the hive seem to minimize problems at a swimming pool nearby. Maintenance has been needed occasionally to control swarming and mites.

Two hives at nature sanctuaries have apparently had no stinging problems, because their entrances are not near foot traffic. Full-size hives outdoors are kept in the vicinity as sources of brood and honey frames. Trained interns and assistants are usually available to answer the most commonly asked questions. BC

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P·R·O·P·O·L·I·S

richard bonney

From a honey bee's prospective, propolis is a substitute for, and a supplement to, and a reinforcer of wax. It's also a building material in its own right. It is a varnish and an embalming material, a bactericide, and probably more that we don't yet realize.

But what is it really?

It has been studied and analyzed in some detail, and we do know its origin and its physical and chemical composition. It is a resinous substance collected by honey bees from the bark and buds of various trees and shrubs. Its specific composition is variable with season and locale. It does seem to have some of the beneficial properties claimed for it, but many of these claims are questionable. We will come back to that.

A question has arisen in the past: Do the bees alter propolis? Probably not. Over the years, suggestions and declarations have been made that the bees add enzymes and perhaps other materials to the collected propolis as they return and deposit it in the hive, and some early reports stated that propolis was actually manufactured by the bees. Later reports stated that there were two kinds of propolis, collected and manufactured. Supposedly, the manufactured material was produced in the bees' bodies using pollen as the raw material and perhaps incorporating other materials such as bee hair, for instance. No scientific evidence supports this notion. An analysis of a sample of propolis scraped from a hive will probably show some of these purported raw materials, but it is reasonable to assume that they are present randomly as detritus from the hive. Pollen, bees' hair and many other materials can be found readily in hive sweepings, and no doubt these materials are incorporated inadvertently into the propolis as it is applied. Scientific analyses in recent years have largely refuted any claims of the bees manufacturing or altering propolis.

Bees collect propolis from the buds and bark of many different tree species, these species varying with geography. Variously reported have been alder, ash, balm of Gilead, balsam, beech, birch, elm, eucalyptus, fir, horse chestnut, oak, pine, poplar, spruce, willow and others. The bees do not restrict themselves to natural sources, however. If they cannot find natural propolis, they will collect and use other substances of similar consistency. They have been known to collect road tar, different types of paint, caulking compound and crude oil. In at least one instance, they upset a manufacturing operation by continually stripping fresh, wet paint from heavy equipment.

An examination of the composition of natural propolis shows a general breakdown into terpenes, resins, volatile oils and other miscellaneous materials. Within that breakdown, approximately 130 different chemicals have been identified. Not every sample of propolis has every one of these chemicals, nor are the proportions the same in all samples, but there is a sameness to all propolis. Physical characteristics include brittleness at cool room temperature, a soft stickiness when warm (we know, we know), a melting temperature around 150°F and partial solubility in alcohol. It is slightly soluble in turpentine and will dissolve readily in ether and chloroform. It is aromatic, and in appearance resembles pitch, with colors ranging from yellow to dark reddish-brown.

"An examination of the composition of natural propolis shows a general breakdown into terpenes, resins, volatile oils and other miscellaneous materials. Within that breakdown, approximately 130 different chemicals have been identified. Not every sample of propolis has every one of these chemicals, nor are the proportions the same in all samples, but there is a sameness to all propolis."

Who collects the propolis?

As with nectar and pollen, there are two aspects to propolis use – collection and application. With both nectar and pollen, foragers collect the material in the field, off-load it in the hive and go off to collect more. They have nothing further to do with processing or handling these raw materials. They are, after all, field bees. The situation is not quite the same with propolis foragers.

Within the total foraging force of a hive, propolis foragers are a small group, and they are a steady group. Not surprisingly, they are bees of foraging age. However, propolis collectors also work in the hive. They are propolis users (or cementers) as well as collectors. They start collecting around mid-morning, as the day warms up and propolis becomes pliable, and finish about mid-afternoon, when the day is beginning to cool and a supply of propolis is on hand in the hive. They then begin to work in the hive, applying the propolis as needed. This group of bees works exclusively at this particular set of tasks for days, collecting and cementing. However, they are supplemented by another group of workers who also cement, but on a more casual basis. That is, they are house bees who do other jobs in the hive as well. Some of this latter group still have active wax

glands.

Why do bees collect propolis?

What do they do with it? A primary use, in fact the use which gave propolis its name, is that of reducing the entrances or openings into the hive. The ancient Greeks observed this use and coined the name from *pro*, meaning before, and *polis*, the city. We have all seen this use, perhaps not so much at the main entrance, but at any of the lesser entrances and ventilation ports that beekeepers are wont to put in hives. Contrary to the belief of many beekeepers, the bees prefer to limit access to their nest.

Cementing or varnishing the walls of the hive and filling cracks and crevices is a second readily observed use. Sometimes we don't appreciate the extent to which the bees do this, but propolis is everywhere in the hive. Take an empty but well-used brood chamber and scrape the wall of the box. It is surprising how much propolis (and wax) you can remove, material that was not particularly noticeable before the scraping. Why do bees deposit the propolis this way? At the entrances or potential entrances, the reason is fairly evident. A smaller entrance is easier to defend and helps to contain humidity in the hive. We often think of the problem of moisture in the hive, but usually in the context of excess moisture in the winter. Too little moisture can also be a problem since there must be a certain level of humidity for successful brood rearing. The brood must not be allowed to dry out. The reason for the varnished walls is not as clear, but again, one possibility is to slow the escape of moisture. Such varnishing is also part of the general filling and smoothing of cracks and crevices, eliminating repositories for wax moth eggs and disease organisms.

Of course, some of the places in the hive that the bees see as cracks and crevices create an inconvenience for us. This goes back to the idea of bee space. Any space in the hive less than about one-quarter-inch wide will be filled, usually with propolis, although sometimes with wax or a combination of wax and propolis. We then must struggle to remove covers, to separate boxes and to remove and replace frames.

This varnishing is further extended to cover foreign objects in the hive that are too large for the bees to remove – a dead mouse for instance. More than one beekeeper has found an embalmed corpse in the hive after a long winter.

Another use for propolis, one we perhaps don't think about a lot is as a wax supplement and strengthener. The bees regularly incorporate propolis into wax, especially in the brood area. We have all noticed how brood comb darkens over time. Usually we attribute this to use and travel stain, and to cocoons and other residual matter in the cells. Certainly these are contributing factors, but propolis adds a substantial part to this darkening. Propolis is actually worked into the wax, supplementing and strengthening it, and more is varnished onto the wax surfaces in the cells, sealing those surfaces. This varnishing is done repeatedly over time, as the cells are used for successive generations of brood, and contributes to the slow reduction in size of the cells.

Next time you place new foundation in a hive, watch the progress from sheet to comb. Periodically pull a frame for close inspection. Use a hand lens. The changes in the wax, from pristine white to tan and then brown over the ensuing months, should give you a better appreciation of that particular use of propolis. Further, if you use a solar wax melter for reducing old brood combs, look at the residue that remains after the wax has been melted from the frame. That black, sticky residue is made up primarily of cocoons and propolis and holds the original cell structure of the comb.

Since bees do not have intelligence in the sense that they do not think and reason, propolis use in a hive is not a matter of their consciously deciding to use it. Presumably, it is an evolutionary behavior, originally stemming from a need to supplement the supply of wax. Bees do not secrete wax at will. They must be a certain age to begin with. Wax glands are activated only when a bee is engorged on nectar (or syrup). No nectar flow, no wax. This means, of course, that during summertime dearths and during fall, winter and early spring, bees secrete little or no wax. Bees are assumed to have originated in subtropical regions where nectar flows were longer, perhaps yearlong, and consequently, wax was more regularly available. As the bees evolved and spread to cooler regions, wax production was less regular. The bees sought a supplement. Propolis was it. Once in the hive it was used as wax, and in fact, is still used as wax.

Not all bees use propolis. In warmer climates with sustained nectar flows, wax is more readily available, and the bees use it in all the ways they use propolis–varnishing (waxing), filling cracks and crevices and strengthening comb, and presumably, this is the behavior that came first in the evolutionary process. Propolis use came later.

Continued on Next Page

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PROPOLIS ... Cont. From Pg. 631

Although all species of *Apis* probably collect some propolis, usage varies greatly. At least three of the Southeast Asian species, *Apis cerana*, *A. florea*, and *A. dorsata*, are considered by some authorities not to use any. Within the single species commonly kept in North America, *Apis mellifera*, the amount and usage varies. Caucasian bees are known as heavy users. Italians and Carniolans use noticeably less. In fact, Carniolans tend to use wax instead of propolis. For all three, usage level reflects, at least in part, the climatic conditions in which they evolved.

In North America, which has no native honey bees, the amount of propolis our bees collect has been a reflection of their ancestry. Since the large majority of our stock for the last one hundred and more years has been of Italian origin, we have seen relatively low levels of propolis use. That is changing. In very recent years, our fingers have been much stickier as Caucasians and perhaps other races have become more popular here.

Propolis does have advantages for those bees that use it. For instance, it does have demonstrated antibacterial properties and it has been suggested that this aids in colony health. However, if so it would be serendipity because not all bees collect propolis. The constant cementing and varnishing seals in disease organisms, rendering them harmless. What about bees in those areas that do not use propolis, or do not use it heavily? Generally, in those geographic areas where propolis is little used, the environment is less severe, and consequently, both environmental stress and disease are less of a factor. That is, there are few, if any, long periods with large numbers of bees in close confinement, there are ample opportunities for cleansing flights, housecleaning is carried out daily, and the bees as a result are *generally* healthier.

How do bees collect it?

It is difficult to observe bees as they forage for propolis. The sources are mostly trees, and the collection sites are usually high, off the ground, and out of casual view. Further, the number of collectors is relatively small compared to other foragers. However, propolis collection from poplar buds has been observed and described.

Propolis (or the resin excreted by the buds) exudes from the buds to form a protective coating, and in places, it forms convenient little clumps and ridges. The actual collection process is hard work. Using their mouth parts and forelegs, the bees break off pieces of the exudate, which are then moistened with their tongues and formed into small pellets, using the mandibles. Then the pellets are passed along to the middle legs and on to the pollen baskets of the hind legs. All of this takes place as the bees stand in place at the collection site, as compared to the pollen packing process, which usually takes place in hovering flight.

Making up a full load of propolis is time consuming, and the bees may interrupt their collecting activity to go back to the hive for 15-20 minutes, presumably to feed. They return to the propolis source with their original loads intact and continue to collect, sometimes repeating the round trip to the hive one or more times until their loads are complete.

As stated, propolis foraging can be difficult to observe. However, freshly collected propolis can be taken from a hive and placed in a convenient place where the bees can find it while an observer watches comfortably. The activity observed in such a situation can never be exactly as would be seen when watching bees collecting from a bud for instance, but the general process is the same. To observe this take freshly collected propolis from a hive and expose it nearby. The bees should find it before long and start collecting. It's a fascinating activity to watch.

When do bees collect propolis?

Some small amount of propolis collecting has been observed in the spring, but collecting generally begins in early summer, at a low level, building to a peak in late summer and fall. This is in keeping with our first noticing fresh propolis in the hive. Of course, there is always some propolis in the hive from past seasons, the amount depending in part on how much scraping and cleaning we do over the course of the season. Presumably, a colony will collect more propolis, and perhaps will start collecting earlier in the season, if large amounts of it are removed during spring cleaning.

Why is this pattern of seasonal collecting prevalent? An obvious assumption is that it relates to preparing the hive for the winter to come. However, this is, in a sense, coincidental. The heavy collecting and cementing activity of the late season is not caused by temperature or climatic change per se, but seems to be a part of the behavior pattern of the bees in the late summer, and is coincidental with decreased wax secretion. They must prepare the hive for winter and the wax isn't available. Propolis is it. Availability in nature obviously plays some role, but that role is dictated, at least in part, by the availability of those bees who produce wax - young workers. When brood rearing ceases, so too does wax production.

How do we collect it?

There is a body of literature which claims value for propolis in the treatment of human ailments. Consequently, there is a modest demand for propolis. Beekeepers can collect the material and sell it, either directly to potential users or to a wholesaler

of the product.

This raises the question of how to collect that sticky, gooey mess. There are two approaches – one of them casual, the other deliberate. What's the difference? I use a casual approach myself, primarily in the fall and winter when the material is hard. I have two opportunities, first, during honey extraction time and later, as I clean and recondition equipment. I scrape whatever propolis I find on any of the hive parts and throw it in a container. Appreciable amounts can build up between hive parts, especially between the end bars of adjacent frames. Some colonies, the heavier users, place large chunks of the material on top of the frames, and often I find masses of it on the top surface of the inner cover, almost as if they had collected more than they needed and just put it in the attic. I collect whatever is easily scraped, perhaps averaging 2-3 ounces per colony, and no two years give the same results.

The second, or deliberate method involves placing a propolis collector on the hive during the active collecting season. The collector is a slotted device, the slots being narrower than bee space. They are usually made of wood or plastic, and they are placed on the hive in such a way as to annoy the bees. That is, the collector violates bees' space in the same manner as a queen excluder, or it violates hive integrity by creating small openings to the outside. Either way, the bees go to work and fill up the slots. When the device is full, the beekeeper removes it from the hive and places it in the freezer long enough to make the propolis brittle. Then, with the wooden model, a hive tool can be used to push the propolis out of the slots. If collector is plastic, it can be flexed in such a way that the propolis will pop out. (Look for propolis collectors in your equipment catalogs.)

Of course, collecting is not the end of it. It needs to be cleaned, especially the casually collected material. Deliberately collected propolis tends to be much more pure. Cleaning is a two-step process. First, go through the pile of propolis, picking out the obvious, gross impurities – parts of bees, slivers of wood and pieces of wax. Then, throw the propolis into a large pail filled with cold water and agitate it briskly. Propolis is heavy; it will sink. Impurities tend to be light; they will float or be suspended. You will probably be surprised at the amount of debris that rises up from this propolis even after you did that initial picking over. Slop off the floating debris, agitate again, slop again. It's an action like panning gold. Don't slop too deep. Keep this up, adding more water as necessary, until nothing more is rising. The propolis now is reasonably clean and usable.

All right, now that you have collected and cleaned it, what do you do with your propolis? Sell it, of course. Look at the classified ads in the magazines. Usually someone is advertising to buy propolis in bulk, five pounds and up. The price is variable depending on quality. In the past, I have seen figures of $3.00 to $6.00 per pound. Another option is to sell it locally. Make up one-ounce packets, suitably labeled, and put them on display with your honey. It may take a while, but a market will usually develop, perhaps for more propolis than you can produce. Collecting and preparing propolis is labor-intensive, and the casual supply is low. Get a fair price. Ask at least $1.00 to 2.00 per ounce.

One caution is in order here. In 1994, some samples of propolis were found to be contaminated with lead, and as a result, health products manufactured from those samples were withdrawn from the market. The precise source of the lead has not been determined, but one possibility is that it came from lead paint used to finish hives. If there is any question about your hive finish, take care.

Claims for human health

Claims for the value of propolis are many, and they must be read critically. Much of the information available, from a scientific point of view, is not reliable. It is based on anecdotal reports, on folklore, and sometimes on wishful thinking. Some research has been done and the results published in scientific journals, but much of the work on propolis has been done in Europe, and many of these reports are not readily available to us.

I have found a number of papers reporting on various aspects of propolis which do reflect valid scientific studies. However, I own three books about propolis and I have come across a number of additional papers, all purportedly giving scientific fact and evidence about the value of propolis to humans, and referring to various scientists, professors and doctors as authorities. Unfortunately, these books or papers seldom cite specific scientific research, and the authorities mentioned only rarely have their qualifications or affiliations listed. Further, some of the information in these books is in contradiction with research findings from more reliable sources. An unfortunate outcome of this is that although some of the information in these books is probably valid and worthwhile, we have difficulty separating it from the chaff.

Claims for propolis are wide-ranging. It is said to be beneficial as an anesthetic, an antibiotic, a regenerator of tissue, an anti-inflammatory and a wound dressing. The list of human ailments said to have been helped is impressive. It includes alopecia, anemia, angina, arteriosclerosis, bronchitis, cancer, colitis, dermatitis, gastritis, halitosis, hay fever, multiple sclerosis, muscular dystrophy, mycosis, Parkinson's disease, psoriasis, sinusitis, tuberculosis, ulcers, varicose veins and more. Without further information, we certainly cannot deny that propolis might be such a panacea, but we can and should question it. Because of this, when selling propolis, making claims on the label should be considered with the *greatest* of care.

Other uses

Historically, propolis has had many other *claimed* uses. One that has gained some notoriety is as an ingredient in the varnish used on violins made by the old masters of Cremona – most notably, Stradivarius. The exquisite tone of these violins has been attributed to this varnish. Modern research acknowledges that propolis was an ingredient of the varnish primers commonly used on violins (and other wood products) of the period, but there is some question as to whether the violins' tone can be attributed to this material. Recent research has not found propolis-based varnish to be better for contemporary violins than any of the readily available modern formulations.

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PROPOLIS ... Cont. From Pg. 633

Then again, it is entirely possible that propolis was a factor in those times and in that place. Propolis is a natural product, the specific makeup of which can and does vary with place, and probably with time. Propolis from the Cremona area perhaps was unique because of the particular vegetation of the area. If so, is it still unique after 300 years?

Propolis and you

The claims of the benefits of propolis to the human body are many, and as stated earlier, at least some of them are questionable. But perhaps you would like to try some yourself. I have used it. I think it helped clear up a dose of poison ivy, but before I make a solid claim for it, I will have to test it again. The poison ivy had almost gone by the time I decided to treat it, so nothing was conclusive. My method was to rub some tincture of propolis on the blisters.

Tincture is an often-recommended method for using propolis. However, directions for making it are not readily available. My method is simple. Place one ounce of cleaned propolis in a jar with eight ounces of alcohol. I use vodka so that if I choose, the tincture can be taken internally. Leave the mixture in the jar for about two weeks, shaking it vigorously at least once per day. Then decant the liquid into a suitable bottle, cap it well, and there you are. The remaining solids are disposable. You can also try this tincture in instances where you might otherwise use merthiolate or iodine.

Keep careful records as you experiment. Perhaps you can add something to the body of knowledge about propolis. BC

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

Statement of Ownership, Management and Circulation

(Required by 39 U.S.C. 3685)

1A. Title of Publication	1B. PUBLICATION NO.	2. Date of Filing
BEE CULTURE MAGAZINE	9 4 2 3 - 8 0	10-1-95
3. Frequency of Issue	**3A. No. of Issues Published Annually**	**3B. Annual Subscription Price**
Monthly	12	$16.50

4. Complete Mailing Address of Known Office of Publication (Street, City, County, State and ZIP+4 Code) (Not printers)

5. Complete Mailing Address of the Headquarters of General Business Offices of the Publisher (Not printer)

6. Full Names and Complete Mailing Address of Publisher, Editor, and Managing Editor (This item MUST NOT be blank)

Publisher (Name and Complete Mailing Address)

John Root, P.O. Box 588, Medina, OH 44258-0588

Editor (Name and Complete Mailing Address)

Kim Flottum, P.O. Box 706, Medina, OH 44258-0706

Managing Editor (Name and Complete Mailing Address)

7. Owner (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual must be given. If the publication is published by a nonprofit organization, its name and address must be stated.) (Item must be completed.)

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The purpose, function, and nonprofit status of this organization and the exempt status for Federal income tax purposes (Check one)

(1) ☐ Has Not Changed During Preceding 12 Months (2) ☐ Has Changed During Preceding 12 Months (If changed, publisher must submit explanation of change with this statement.)

10. Extent and Nature of Circulation (See instructions on reverse side)	Average No. Copies Each Issue During Preceding 12 Months	Actual No. Copies of Single Issue Published Nearest to Filing Date
A. Total No. Copies (Net Press Run)	11,671	11,550
B. Paid and/or Requested Circulation 1. Sales through dealers and carriers, street vendors and counter sales	192	75
2. Mail Subscription (Paid and/or requested)	10,605	10,210
C. Total Paid and/or Requested Circulation (Sum of 10B1 and 10B2)	10,797	10,285
D. Free Distribution by Mail, Carrier or Other Means Samples, Complimentary, and Other Free Copies	217	217
E. Total Distribution (Sum of C and D)	11,014	10,495
F. Copies Not Distributed 1. Office use, left over, unaccounted, spoiled after printing	657	1,055
2. Return from News Agents	0	00
G. TOTAL (Sum of E, F1 and 2—should equal net press run shown in A)	11,671	11,550

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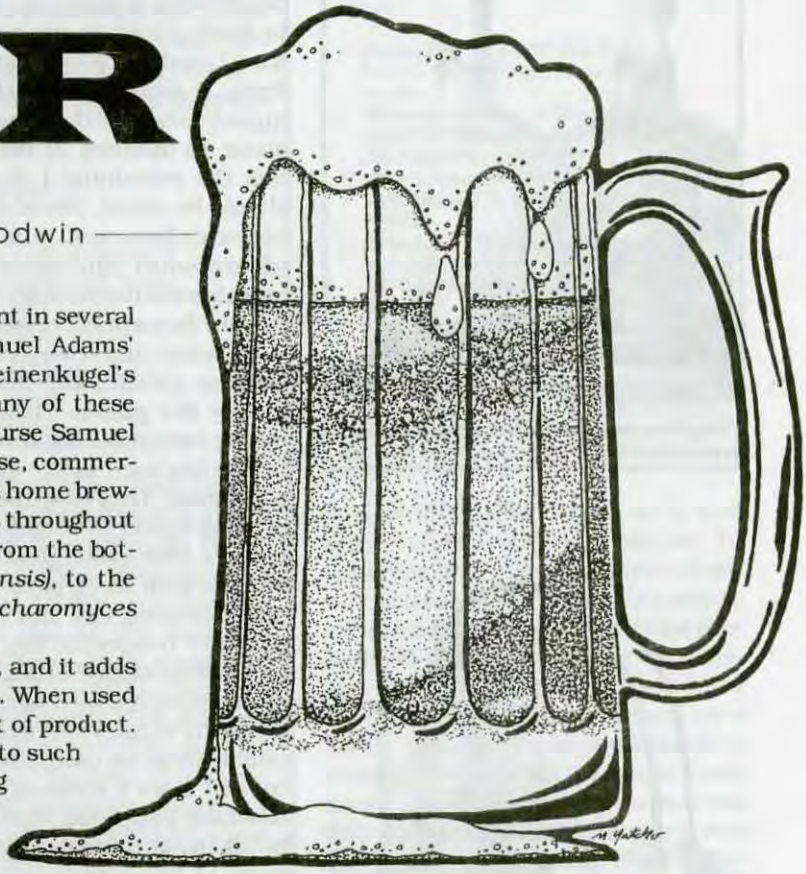
PS Form 3526, January 1991

MAKING HONEY BEER

bob berthold & greg godwin



Honey has recently become an exotic ingredient in several commercially available beers. These include Samuel Adams' Honey Porter, J.W. Dundee's Honey Brown Lager, Leinenkugel's Honey Weiss and Brewer Hill's Honey Amber. Many of these beers are made at local microbreweries, but of course Samuel Adams is distributed nationwide. As is often the case, commercial brewers are years behind the ever-experimental home brewers. Honey has found its way into a variety of brews throughout the years, ranging from rich, dark porters (made from the bottom fermenting yeast *Sarccharomyces carlsbergensis*), to the lightest lagers top fermenting ale (made from *Sarccharomyces uvarum*).

Honey, when used sparingly, ferments readily, and it adds more to alcoholic content and body than to flavor. When used more heavily, the result is a hybrid beer/mead sort of product. While some hard-core beer drinkers may be averse to such a creation, many beer drinkers find it a refreshing variation.

College students are probably the experts on beer, since we think they consume more than any other age group. Each year, we hold a mead-honey beer seminar on campus. There are many samples of both beverages available for tasting by those in attendance. Most of the honey beers we've supplied have gotten rave reviews.

We have been brewing for a number of years now, with varying degrees of success. Some of our most successful brews include honey among their ingredients. In particular, a honey-ginger lager has raised the most eyebrows and hence, the most glasses. Even some non-beer drinkers appreciate this blend. A less popular creation was a honey-spruce lager. The spruce added a love/hate quality to the brew. While some found it "enticing" or "delicious," others likened it to a cleaning product.

In general, light honey is best for brewing. Clover, alfalfa and orange blossom honeys are preferred, as they will not overpower the other flavors in the beer. Darker honey, such as buckwheat honey can be used in moderation in beers with other strong flavors. If "real beer" flavor is desired, honey should not account for more than one-third of the total fermentable sugars. Malt should compose the balance, and corn sugar should be avoided except for priming. The honey should be added and boiled along with the malt to ensure proper mixing and for pasteurization.

The following recipe is loosely taken from the *New Complete Joy of Homebrewing* by Charlie Papazian.

The procedure for making the following beer is quite simple. Any special equipment is readily obtainable from a local home brew supplier or one of various mail order companies. If you have not brewed before, inexpensive starter kits are available for very reasonable prices.

Linda's Lovely Light Honey Ginger Lager

4 lbs light dried malt extract
3 lbs light honey
2 oz Cascade hops
2-4 oz fresh ginger
1 packet of yeast
3/4 cup corn syrup

The amounts of malt and of honey have been rounded up to the nearest pound for two reasons. First, we like stronger beers, and second, we purchase malt in two-pound bags and we don't like leftovers.

To brew this beer, boil the malt extract, the honey and all but 1/2 oz of the hops with about 1.5 gallons of water. A large pot is recommended to prevent boil-overs. I use a large, enameled lobster pot. If you are using an electric stove, placing a trivet made of a bent coat hanger on the burner can prevent scorching the bottom of your pot. Heating your honey, either in a microwave oven or a hot-water bath allows it to mix readily. Some hot water can also be added to the honey, which can then be added

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BEER ... Cont. From Pg. 637

Five gallon glass and plastic containers with fermentation locks.

Sparging "racking" the beer.

Bottle Capper

to the pot and blended in using a mixer. This mixture should be boiled for about one hour, with frequent stirring.

During this time the ginger can be prepared. It should be grated, diced or finely sliced. In my best batch to date, I used 4 oz of fresh ginger, grated finely. It should be added to the other ingredients after they have boiled for about 45 minutes. At the end of the boil the remaining 1/2 oz of hops should be added. These will contribute extra flavor and aroma to the finished product. After about three minutes this mixture is ready to be added to your fermenting vessel.

Fermenting vessels can be either glass or plastic, and hold approximately five gallons. Plastic fermenters are food-grade buckets with tight-fitting lids such as five-gallon honey containers. They have the advantage of being lighter in weight and less expensive. Five-gallon glass containers, often known as carboys, with slight imperfections, can also be obtained at a very reasonable cost from companies who supply bottled water. Beer often improves with age, and if you are going to age your beer, glass containers must be used. Plastic cannot be used, since it allows oxygen to contaminate your aging beer. Care must be taken not to scratch the inner surfaces of the plastic containers, as these scratches can harbor microorganisms and foul your brew.

Before adding the hot mixture to your fermenter, several things must be done first. The fermenter should be clean and sanitized. I soak mine with a bleach solution of 1/2 oz bleach to five gallons of cold water and then rinse it well. To this fermenter, add three gallons of cold water, which prevents stress to the vessel when adding the hot mixture. The mixture should be poured through a sanitized strainer, and you'll need a funnel if a carboy is used. If whole hops are used, pour water through the hops in a strainer to bring the level up to five gallons. This gets a little extra bit of flavor from your hops. In any case, the level should be brought up to five gallons.

The fermenter should then be covered and set aside to cool. A floating thermometer, sanitized of course, can be used to monitor the temperature. When the temperature drops to 75°F, the yeast can be added. If you have a hydrometer, specific gravity can be measured at this point. One or two packages of dried yeast can be sprinkled on the top. The yeast can be rehydrated with hot water, but for a beginner, sprinkling will suffice. A fermentation lock should be attached and the mixture set aside. An area with a cool, stable temperature is preferred.

After a week to 10 days, fermentation should have slowed and stopped. The beer should be clearer and the flow of bubbles through the fermentation lock should have stopped. If you have a hydrometer, take readings on consecutive days until no change is seen. Avoid any contact of non-sanitized material with your brew. Do not return the samples to your fermenter. Dump them out or drink them. When fermentation is complete it is time to bottle your beer.

When bottling your beer, returnable bottles must be used. They are sturdier, and they will seal properly with conventional crown caps. Grolsh-type flip-top bottles also work well. Five gallons of beer will fill about 53 12-oz or 40 16-oz bottles. The bottles and caps should be sanitized. The previous bleach solution should suffice. Sterilizing the bottles in advance saves a lot of hassle on bottling day.

Prior to bottling your beer, it must be sparged (racked; siphoned) into a separate container. In this process, the beer is siphoned into another sanitized vessel leaving the yeast sediments and other debris behind. A five-foot length of plastic or rubber tubing is used, attached to a racking cane. It is best to start the siphon by filling the tube and the cane with water to get the flow started. If you choose to start the siphon with your mouth, you should rinse your mouth with antibacterial mouthwash or strong liquor to prevent contamination.

While sparging (racking) your beer, you can prepare your priming sugar. This sugar will fuel additional fermentation in the bottle. The result will be the carbonation characteristic of beer. For this recipe, 3/4 cup of corn sugar is used. I like to boil it for about 10 minutes in a pint of water to prevent any contamination. This hot sugar water is then added to the beer that has been siphoned into the sanitized container. From this container, the beer can be siphoned

OTHER RECIPES

william goslin

Honey Porter

1 lb dark dry malt extract
3.5 lb amber dry malt extract
0.25 lb black patent malt
0.25 lb chocolate malt
1.5 oz of Kent Goldings hops
1 oz of Willamette hops
1.5 tsp. yeast nutrient
4 campden tablets
2 tsp. Irish moss
2 lb of clover or other light honey
Yeast Lab Irish Ale yeast (make starter two days ahead)

Combine all malts, add Goldings hops, the yeast nutrient and the campden tablets and boil for one hour placing grains in a mashing bag. Boil the above in a 20-quart or lager pot ¾ full at 165°F for 60 minutes. During the last 15 minutes of the boil add the Willamette hops, Irish moss and the honey, reducing heat to 145°F. Cool wort to 80°F, add balance of water to five gallons pitch yeast. Ferment to completion, add ¾ cup of corn sugar and bottle. Wait three weeks and enjoy.

Honey Wiezen

3.5 lb clover or other light honey
4.5 lb wheat malt
1.5 oz Hallertau Hersbuker hops
4 campden tablets
1 oz Tettnanger hops
2 tsp. Irish moss
Yeast Lab Barvarian Wheat yeast (make yeast starter two days ahead)

Boil the malt for one hour at 145°F. Then raise temperature to 165°F for one hour; add 1 oz Hallertau hops, campden tablets and the yeast nutrient at this time. For best results, use whole hops or hop plugs, however palletized hops can be used. Add the honey, Irish moss, and the rest of the Hallertau hops and reduce heat to 145°F; boil for 15 minutes. Add the Tettnanger hops; boil for five minutes. Sparge grain with 3.5 gallons of water heated to 170°F. Bring to 80°F and pitch yeast. Ferment to completion, add ¾ cup corn sugar and bottle. Wait three weeks and enjoy.

Honey Rye

1 lb rye malt
3 lb light dry malt extract
1.5 oz Kent Goldings hops
1 oz Willamette hops
1.5 tsp. yeast nutrient
4 campden tablets
2 tsp. Irish moss
1.5 lb light honey

Combine all malts and boil for one hour, placing the grains in a mashing bag. Boil the above at 165°F. Add Goldings hops, yeast nutrient and camden tablets; 15 minutes before the end of the boil add Willamette hops, Irish moss and honey, making sure to reduce heat to 145°F. Cool wort to 80°F. Add balance of water to five gallons; pitch any ale yeast. Ferment to completion, add ¾ cup corn sugar and bottle. Wait three weeks and enjoy.

Honey Brown Ale

1 Munton & Fison Nut Brown Ale Kit
2 lb any medium-flavored honey

Boil honey for 15 minutes at 145°F, making sure you skim off scum. Add kit at the end of the boil and stir until all is dissolved. Cool wort to 80°F; add balance of water to five gallons, pitch yeast with kit or any ale yeast. Ferment to completion, add ¾ cup corn sugar and bottle. Wait three weeks and enjoy.

Have Many a Fine Brew!!!
Bill Goslin recently won 1st place Melomel at the 94-95 Ambrosia Adventure. An avid meadmaker, Bill is currently working on his first book on meadmaking. Susan Price, Editor, Inside Mead

SOURCES

All of the recipes make a little over two cases of beer. Here are a few home-brew supply stores.

- Highlander 1-303-794-3923
  151 W. Mineral Ave., Littleton, CO 80120
- William's Brewing 1-800-759-6025
  2594 Nicholson Street, PO Box 2195
  San Leandro, Ca 94577
- Brew it Yourself 1-915-584-BREW
  6330 Suite B N. Mesa, El Paso, TX 79912
- James Page Brewing Company
  1-800-347-4042
  1300 Quincy St. NE, Minneapolis, MN 55413
- The Vineyard 1-800-626-2371
  PO Box 80 Upton, MA 01568

Additional information about brewing using honey available from the National Honey Board, Box 281525, San Francisco, CA 94128-1525. Fax (415) 340-8568 and phone (800) 356-5941.

into bottles.

When filling bottles, a bottle filler is highly recommended to control the flow. The bottles should be filled, leaving a one-inch space to allow proper carbonation and to prevent exploding bottles. The bottles should then be capped with one of many available capping devices. I find a bench-type capper to be the easiest to use. The bottles should be stored in a cool place, away from light. Within 10 days, the beer should become clear.

At this point, the beer is ready to consume. However, I have found that many of my beers improve with several months of aging. It is therefore a wise idea to set some aside and try a bottle periodically to see how it is coming along. Often, even the worst brews have the capacity to become fine with age. Likewise, a good brew can become outstanding. When drinking homemade beer, pour it into a glass, leaving behind the sediment in the bottle.

Bruce's and Ray's Honey Spruce Lager

3.3 lb unhopped dark malt extract syrup
2 lb dried amber malt extract
2 lb light honey
3/4 lb crystal malt
1/3 lb black patent malt
1.5 oz Cascade hops
1/2 oz Hallertauer hops
1 oz spruce essence
1 package lager yeast
3/4 cup corn sugar

Pour 1.5 gallons of cold water into your pot. Place the crystal malt and black patent malt into a grain bag. This acts like a giant tea bag, and it makes it easy to remove the grains when the fermentative process is over. The grains should be crushed, either by your home brew supplier or at home. If you choose to do it yourself, place the grains in a sturdy plas-

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BEER ... Cont. From Pg. 639

tic bag and crush them with a rolling pin. Heat the water and grains until boiling, then remove the bag with the grains in it. Add the malt, the honey and the Cascade hops and boil for 45 minutes. In the last few minutes, add the Hallertauer hops and the spruce essence. Pour this through a sanitized strainer into your fermentation vessel and make up to five gallons by adding cold water. Follow the procedure explained above for adding yeast and corn syrup when bottling.

Carl's Crystal Honey Lager

Carl got his basic recipe from Charlie Papazian's *The Complete Joy of Home Brewing*. He altered the basic recipe by using a different malt extract, different hops and adding more honey.

3.5 lbs extra-light dried malt extract
3.5 lbs Northern Brewers hops (boiling)
1 oz Hallertauer hops (finishing)
1 package lager yeast
3/4 cup corn sugar (bottling)

Dissolve honey and malt extract in 2-3 gallons of water and bring to a boil while stirring occasionally to prevent scorching. Add boiling hops and boil for 60 minutes. Add finishing hops and boil for two minutes more. Remove from heat and add primary fermenter, diluting to five gallons total volume. Pitch yeast when temperature of mix (wort) is 70 to 80°F. When primary fermentation is complete, transfer mix to secondary fermenter and allow to age (lager) for one to two weeks at 50 to 60°F. Bottle using the 3/4 cup of corn sugar to prime the mix and let age in the bottle for three to four weeks. Flavor will improve with age.

Bill's Brews

The following recipes are taken from Charlie Papazian's book *The New Complete Joy of Home Brewing*.

Propensity Pilsner Lager

5 lbs plain light dried malt extract
1 lb crystal malt
2.5 lbs light honey
2.5 oz Saaz hops (boiling): 10 HBU (hop bittering units indicating how bitter brew will be)
1/2 oz Tettnager hops (flavor)
1/2 oz Saaz hops (finishing)
1-2 packages lager yeast
3/4 cup corn sugar or 1.25 cups malt extract (for bottling)

Add the cracked crystal malt to 1.5 gallons of cold water and bring to a boil. When boiling has commenced, remove the grains with a strainer. Add the malt extract, honey and boiling hops, and boil for 45 minutes. Add the Tettnaager hops 10 minutes before the end of the boil. Add the Saaz hops during the final one to two minutes of the boil. Sparge (filter rack) immediately, add wort (boiled mixture) to fermenting vessel and add cold water to make five gallons. When fermentation is done, add the 3/4 cup of corn sugar and bottle.

Rocky Raccoon's Original Crystal Honey Lager

3.5 lbs plain light dried malt extract
2.5 lbs light clover honey
1.5 oz Cascade hops (boiling): 7.5 HBU (homebrew bitterness units indicating how bitter beer will be)
1/2 oz Cascade hops (finishing)
1-2 package of yeast
3/4 cup corn sugar of 1.25 cups dried malt extract (for bottling)

Add malt extract, honey and boiling hops to 1.5 gallons water and boil for one hour. Add the finishing hops during the final two to four minutes of boiling. Sparge (filter) into fermenter and add cold water to make up to five gallons. Add yeast, and when fermentation is complete, add 3/4 cup corn sugar and bottle.

Belgium's Hoegarden Grand Cru Ale

5 lbs light or extra-light dried malt extract
2.75 lbs light honey
1 oz Hallertauer hops (boiling): 506 HBU
1/3 oz Hallertaur hops (flavor)
1/2 oz hallertauler hops (aroma)
1.5 oz freshly crushed (crush the whole seeds yourself) corriander
1/2 oz dried ground orange peel
1-2 packages ale yeast
3/4 cup corn sugar or 1.25 dried malt extract (for bottling)

Add malt extract, honey and boiling hops to 1.5 gallons of water and boil for 45 minutes. Then add 3/4 oz crushed coriander and flavor hops and boil for 10 more minutes. Then add 3/4 oz crushed coriander and orange peel and boil for five minutes more. During the final one to two minutes, add the aroma hops. When boiling is complete, sparge (filter) into fermenter and add cold water to five gallons. When fermentation is finished, add 3/4 cup corn syrup and bottle.

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These recipes are just a few of an infinite number of recipes. Home brewers are limited only by their imaginations and perhaps by certain natural laws. Both the amateur and the experienced brewer will be rewarded by experimenting with honey in their brews. As honey is the basis of man's earliest fermented beverage, mead, brewing with honey links the modern brewer with his distant brewing ancestors. Commercial brewers have much to learn from both these modern and ancient artists. BC

Bob Berthold is a professor of biology at Delaware Valley College in Doylestown, PA. He is an active educator in the beekeeping industry.

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Greg Godwin is a graduate student at Delaware Valley College.

Antique Gardens

Consider growing some of these old-fashioned favorites and save time, money and provide beauty — for you and your bees

b.a stringer

In the mid-1800s, the Parkinson Society was founded "to search out and cultivate old flowers which have become scarce." The cultivation of antique, open-pollinated varieties became increasingly popular, and today there are many organizations that encourage the propagation of flowers that are "old fashioned." Some seed catalogs now offer "heirloom" varieties in their listings.

At the same time, there has been a resurgence in appreciation for the cottage garden with no set plans, just enough room for each plant to grow and mingle with its neighbors. Color combinations – riotous or subdued, warm or cool, planned or random, are the selection of the gardener. Flowers are simply sown or transplanted with the short ones in front, tall ones in the back, mixed and matched to the grower's pleasure. Many of the plants reseed themselves from year to year, with minimal intervention. Such easy cultivation sounds like an ideal garden prescription for a busy beekeeper!

While the modern plant catalogs offer a vast array of spectacular flowers, many of these are highly developed hybrids from which seed does not come true. This means that you cannot save their seeds and get the same plants from growing out the seed; you have to buy another packet of seed to reproduce the same floral display. Gardening and beekeeping overlap in many ways, and there are seasons when both require work at the same time. Consider growing some of these old-fashioned, open-pollinated flowers to save yourself some time and money, yet still provide a beautiful garden that is also attractive to bees. Seed sources are noted in parentheses at the end of each plant's description.

Calendula, Pot Marigold Ruddles (*Calendula officinalis*). Blooming from July to frost, Calendulas offer a steady supply of nectar and pollen in their cheery golden flowers. Their name comes from the Latin 'calendae, meaning the first day of the month, referring to the long flowering period, as the plant may be in bloom at the first of many months of the year. Calendula is sometimes used in English country cooking, where one head of calendula is added to a thick soup brew. A 1588 cookbook was found to contain a recipe for chicken broth seasoned with calendula, marjoram, parsley and thyme. Another 16th-century book contains a calendula concoction to "enable one to see the fairies."

An annual which self-seeds readily, calendula is well suited for borders, containers, cut flowers and kitchen gardens. The plants thrive with little attention and are easily grown from seed or transplanted from purchased seedlings. The flowers, ranging in color from pale yellow through deep orange, are borne singly on 18-inch stems. The single-flowered varieties are the older types; double-flowered kinds are modern developments which are of little use to bees. (1,3,4,5)

Canterbury Bells (*Campanula medium*) A source of both nectar and pollen, Canterbury bells bloom from late spring to mid-summer, about the same time as do foxgloves. The tall, hip-high plants bear a spire of large, nodding bell-shaped flowers to which their name, derived from the Latin word for "little bell," refers. These flowers were known as Coventry bells in the 16th and 17th centuries, around the time when pilgrims to the shrine of Thomas à Becket at Canterbury rejoiced at the sight of the Canterbury Cathedral spires after their arduous journey. It is not known when the name was switched from Coventry to Canterbury.

As early as 1760, these plants were offered for sale to the American public in a Boston newspaper, and rapidly became a mainstay in colonial gardens. Some of these gardens were self-sowing, including a mix of

pinks, poppies, larkspurs and Canterbury bells, providing a show of flowers every year. Canterbury bells are biennial, blooming the second year after seed is sown, but transplants will bloom the year they are set out. Apart from good watering, the plants have few requirements and will make themselves at home in almost any garden. Colors of the single-flowered varieties available include blue, pink, mauve, rose and white. There is also a semi-double variety "Calycanthema" which is known as cup-and-saucer, with the bell representing the cup and a frill at its base the saucer. (1,5,6)

Cornflower, Bachelor's Button, Bluebottle (*Centaurea cyanus*) Bees collect both nectar and pollen from cornflowers throughout the summer-long bloom. This flower has been around for a long, long time . . in fact it is present in a small wreath with olive leaves on the second sarcophagus of King Tutankhamen. It is often called the bluest flower in the garden, its color exactly matching the old-fashioned blue Nankin china. The common name of Bluebottle is thought to refer to the similarity between the flower base shape and Old Testament wineskins. *Centaurea* is named for the mythical centaur Chiron, who used the flowers to heal a wound and later showed men how to use herbs for healing. Part of a large genus of about 500 species, and readily grown from seed, these plants have no special requirements. They grow about knee-high, and whether growing wild or cultivated in the garden, are always accompanied by bees seeking nectar and pollen. (1,2,3,4,6)

Wallflower (*Cheiranthus cheiri*) During spring and early summer, bees visit wallflowers for both nectar and pollen. This plant, native to the Canary Islands and Madeira, grows about as high as a one-story hive. It appears on ancient Roman lists of desirable ornamentals and was also grown in early Persian gardens. In 1625, Francis Bacon wrote an essay, "Of Gardens," stating that wallflowers should be planted under parlor windows where the scent could be enjoyed by those indoors. Wallflowers were used in knot gardens as filler plants in 16th-century French *parterre* gardens and were popular components of Tudor English bouquets. In fact, its botanical name comes from the Greek words *kheir* and *anthos*, meaning "hand-flower." In 1807 Thomas Jefferson acquired seeds from Philadelphia seedsman Bernard McMahon, author of *The American Gardener's Calendar*. He grew the plants successfully in pots at Monticello, bringing them inside for winter protection, as they are not really winter-hardy. The roots must always be kept moist, and deadheading will prolong bloom. Wallflowers are half-hardy perennials, treated as biennials, and are still grown at Monticello. (1,4)

Honesty, Money Plant, Moonwort (*Lunaria annua*) Some nectar and pollen are produced by this plant through its bloom in April and May. This plant has the reputation for thriving for those who told the truth. It was introduced into cultivation from Sweden in 1570, and was an early favorite in colonial gardens when the root was sometimes used in salads. In John Josselyn's list of vegetables and flowers grown in the colonies (1665), he called the plant White Satten, referring to the smooth dried pods. It was also advertised in a bulk seed list in 1760, with a note that it would be "sold in small parcels that everyone may have some." The sweetly scented flowers give way to translucent seedpods which earn the folk names of "money flower," "money seed," "money-in-both-pockets" and "moonwort." Growing about knee-high, Honesty is attractive combined with wallflowers or in a mixed flower bed. It grows well even in poor soil and freely reseeds. (1,6)

Poppies (*Papaver species*) Poppies produce abundant pollen, which is very popular with bees. These are the true poppies, named from the Latin *papa* (thick milk), referring to the juice of the opium poppy. A hip-high annual with grey-green foliage, the opium poppy, *Papaver somniferum*, has been in cultivation for centuries for various uses. The white, pink or red silky flowers appear in summer and give way to attractive seedpods often used in dried arrangements. These poppy seeds, heat-sterilized, were formerly called maw seed, and are commonly used in baking. They have also been a component of mixed seed fed to cage birds, as they are high in oil.

The field poppy, *P. rhoeas*, is also known as the Flanders or corn poppy. Its petals are the source of red pigment used in wines and medicines, and the plant does have some narcotic properties. This is the parent of Shirley poppies which were bred by Rev. Wilkes of the Shirley Vicarage in England from a single white-edged flower found in a field in 1880. Thomas Jefferson grew a white opium poppy at Monticello and naturalized field poppies in the grove there.

The Oriental poppy, *P. orientale*, was discovered in 1702 and sent to France for Louis XIV By the mid 1770s, seed had been distributed through England to John Bartram in Philadelphia. This large, clumping perennial has hairy leaves and huge red or pink flowers with lustrous black centers. Pollen is shed from a mass of anthers and is very attractive to bees, as you can often see several bees in a single flower revelling in the pollen. (1,4,6)

Rugosa rose (*Rosa rugosa*) Roses produce pollen but no nectar. We know they are very ancient flowers, as geologists have found Oligocene deposits in Colorado that have roses which grew 35 million years ago. A rose is shown in a Crete fresco dated about 2000 B.C. Roses were cultivated by the Chinese about 500 B.C. and by the Greeks about 300 B.C. The Romans loved roses, and spread them throughout Europe. Rosaries, strings of prayer beads used in the Catholic church, were originally made of rose petals compressed into beads in memory of the rose wreath given to St. Dominic by the Virgin Mary. From 1817-1824, the renowned painter Pierre-Joseph Redouté published his record of 700 roses collected by the Empress Josephine at her Malmaison

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ANTIQUE GARDENS ... Cont. From Pg. 643

gardens. This was the largest single reference of rose species and varieties compiled, and even today "old-fashioned" or moss roses in illustrations are most likely to have been first painted by Redouté. In the early 1880s, John Champneys began the first American rose breeding efforts in Charleston, South Carolina. Today there are over 12,000 named roses.

The first rugosa roses were brought from Japan and China to Europe in 1784, thence to England. By 1806, in America, seedsman Bernard McMahon's catalog of "Hardy Deciduous Trees and Shrubs" offered "*Rosa rugosa*, the wrinkled-leaf rose." The plant is hardy, robust, prickly and fragrant. It tolerates salt, poor soil, wet soil, drought and cold temperatures. You can prune it or not, to suit, as it blooms on old and new wood from May to October. Rugosa rose flowers are purple, rose and white, nice cut flowers and sweetly scented. The plant's vigorous growth and tolerance to growing conditions have led to its use as understock for more temperamental roses. In fall, the sturdy bushes are adorned with bright rose hips, which have 20 times more vitamin C than orange juice. (1,2)

Marigolds (*Tagetes erecta*, African marigold, *T patula*, French marigold) Nectar and pollen are produced by the single-flowered varieties of marigolds (and a few double flowered varieties) throughout their summer and fall bloom. The native habitat of the genus *Tagetes* is from New Mexico to Argentina. Both African and French marigolds actually originated in Mexico. After the Conquest, seeds

were sent to Spain and disseminated to monasteries in France and North Africa. The French marigold was brought to England in 1573 by Huguenot refugees, while the African marigold became naturalized in North Africa and was rediscovered in 1596. Their common names were given to distinguish them from the English native pot marigold, *Calendula*. In 1633, Gerard's *Historie of Plantes* noted that these new marigolds should not be eaten, unlike the pot marigold. *Tagetes* was named for an Etruscan deity said to have sprung from the earth as it was being ploughed.

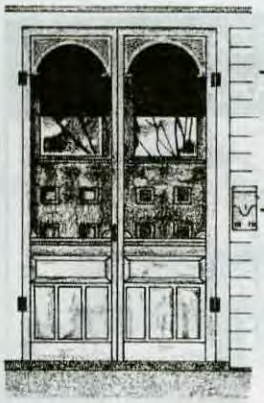
The French marigold (*T patula*) grows to two feet with yellow or orange flowers, sometimes with markings. It was popular with 18th-century florists, and today the flowers are often grown as a natural pest deterrent in gardens. French marigolds were grown in combination with larkspur at Monticello.

African marigolds (*T erecta*) are taller plants with larger flowers. 18th-century gardeners said they grew to five feet, but varieties today are shorter. Single-flowered forms of African marigolds were also grown at Monticello, and The Thomas Jefferson Center for the Preservation of Historic Plants still propagates these species and offers seed for sale. Gertrude Jeckyll used them in her famous herbaceous borders in the "hot" centers of beds, winged by selected "cool" flowers at each end. (1,4,6)

These flowers and many others have a long history of cultivation and usefulness. Try growing some in your own yard for your bees and your own pleasure and leisure. BC

B.A. Stringer grows antique flowers, as well as many other bee plants from her home in Oregon. She is a freelance writer and regular contributor to Bee Culture.

Sources:
1. Thompson and Morgan, P.O. Box 1308, Jackson, NJ 08527
2. Abundant Life Seed Foundation, P.O. Box 772, Port Townsend, WA 98368
3. Environmental Seed Producers, Inc., P.O. Box 5904, El Monte, CA 91734
4. Thomas Jefferson Center for Historic Plants (TJCHP) Monticello, P.O. Box 316, Charlottesville, VA 22902
5. Wellsweep Herb Farm, 317 Mt. Bethel Road, Port Murray, NJ 07865
6. W. Atlee Burpee, 300 Park Ave., Warminster, PA 18974



HOME HARMONY

ann harman

Herbs & Spices

Gold! Spices! These two items, perhaps more than any others, have shaped our world. The quest for these commodities sparked exploration, even at the cost of ships and lives. Today, we hardly give a thought to the history of spices and herbs as we reach for a bottle of cinnamon. Why were spices and herbs so important? In the past, were they sought to mask the flavor of rotten food or to improve the flavor of boring food? Were spices and herbs considered medicines or just pleasant flavorings? Perhaps spices and herbs filled all those roles and even some we may not have considered.

The ancient Egyptians recorded their uses of spices and herbs. China, Mesopotamia and India had thriving spice businesses in the first century. The trade routes that opened across the East brought spices and herbs to Greece, and from there to Rome and on into Europe. The settlers brought them across the ocean to the New World. The hazards of the trade routes, plus unscrupulous traders, elevated the spice prices to astronomical levels. In the ninth century, cloves and mace commanded a price equivalent to $18 a pound. Pepper was so scarce that people could afford to buy only one peppercorn! Today, spices and herbs are sent around the world from their native habitats to be enjoyed and used by all. Many spices and herbs are still used medicinally, and many more are being investigated for the same use.

The herb garden was a focal point of many kitchen gardens of the past. Today's gardeners frequently tuck a few herb plants into vegetable gardens, or into flower beds, or grow a few in pots on windowsills. The mints will grow almost anywhere if given a bit of water from time to time. A freshly picked sprig of any herb will liven up winter meals as well as contribute a pleasant aroma to the room. If you plan to grow some herbs, you might like to plant a bit of catnip for your favorite cat.

Bees also appreciate the spices and herbs. Many of these flowers are attractive to bees, so if you are able to grow a few, you will benefit your colonies a little bit as well as your own meals.

Spices and herbs blend perfectly with honey flavors. In fact, honey has frequently been used to make medicinal herbs palatable. Choose honey flavors that will complement the spice or herb you have chosen for seasoning. Don't be afraid to experiment. However, remember it is best to start out with just a little pinch, then increase the amount of herbs and spices to taste. Flavors frequently are enhanced if allowed time to mingle.

Both spices and herbs will lose their delicate flavors if not used quickly or not stored properly. If you are buying spices and herbs already crushed or ground, choose the smallest container that will serve your needs. Figure on a one-year shelf life. Although spices and herbs do not spoil, many of their subtle aromas and flavors will disappear after some months – not unlike honey. Select small glass jars with tight-fitting lids. Store all spices and herbs out of the sun and heat. A dark kitchen cabinet is fine if it is in a cooler place in the room. But don't put the flavorings out of reach. Herbs and spices can be used daily to improve all foods. (But don't overdo them.)

At this time of year, plans are being made for Thanksgiving dinner and the beautiful pumpkin and apple pies that top off the meal. Of course, both of those desserts would be quite bland without their usual addition of cinnamon and other spices. This first recipe is not for pies at all, but for a really delicious pumpkin bread that can be enjoyed any time. Have a piece with a cup of hot cider. For the best flavor use a fresh cooking pumpkin in this recipe, not a jack-o'-lantern pumpkin. Buy a whole nutmeg and a little nutmeg grater, and you will appreciate the aroma and flavor of freshly grated nutmeg.

PUMPKIN BREAD

2 eggs
1 cup honey
1/2 cup oil
1 cup grated pumpkin
2 cups whole wheat pastry flour
1 teaspoon soda
1/2 teaspoon salt
1/2 teaspoon nutmeg
1/2 teaspoon cinnamon
1/4 teaspoon ginger
1 cup raisins
1/2 cup chopped nuts
1/2 cup water or low-fat yogurt, if needed

Cream eggs, honey and oil together and mix in the pumpkin. Sift the dry ingredients into the wet ingredients. Mix well and stir in the raisins and nuts. Add the water or yogurt if necessary and pour into 2 oiled bread pans. Bake at 350° for 65 to 75 minutes.

Honey And Spice
Lorena Laforest Bass

PASTA PRIMAVERA

Frequently, we look for a quick but nourishing recipe for vegetables. This next recipe will take care of your dinner menu if it is served with your choice of meat. If you have fresh basil and oregano from your garden or flower pot, you will have a wonderful taste treat.

2 tablespoons salad oil
2 tablespoons butter or margarine
1 clove garlic, minced
1 cup broccoli florets, blanched
1/4 cup slivered carrots
1/2 cup slivered zucchini
1 medium tomato, seeded and diced
1/2 teaspoon basil
1/2 teaspoon oregano

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HOME ... Cont. From Pg. 645

2 tablespoons mild-flavored honey
salt and pepper to taste
1/2 pound cooked linguine OR fettucini noodles
grated Parmesan cheese

Heat oil and butter in large skillet. Add garlic and broccoli. Stir-fry for 2 minutes. Reduce heat and add carrots, zucchini, tomato, herbs and honey. Simmer 5 minutes, stirring gently. Season with salt and pepper to taste. Place hot linguini on a warm platter. Cover with vegetable mixture. Sprinkle with Parmesan cheese. Makes 4 servings.

Honey Naturally
California Honey Advisory Board

TEXAS STYLE CHILI

Sometimes we get into a rut by using the same spices over and over again. This recipe uses cumin, which gives this chili a great flavor. Make a pot of this chili on a frosty weekend.

3 pounds lean ground beef
1 cup chopped green pepper
2 cans whole tomatoes
1 can tomato paste
2 teaspoons chili powder
2 teaspoons oregano flakes
1-1/2 cups chopped onion
3 cloves garlic
2 cups water
8 teaspoons beef bouillon
1 teaspoon ground cumin
2 teaspoons honey

In a large kettle, brown beef and drain fat. Add onion, green pepper and garlic. Cook until tender. Stir. Add remaining ingredients. Cover, bring to a boil. Reduce heat; simmer 1-1/2 hours or until meat is tender. Serve with corn chips and shredded cheese if desired.

Cooking With Honey
Kansas Beekeepers

BARBECUED PORK WITH BROCCOLI AND BUCKWHEAT NOODLES

For this next recipe, you can use the Chinese five-spice powder already mixed or you can mix your own. The five-spice mixture is very good and useful with meats. If you wish, you can mix a batch of it and keep it tightly covered for use in other recipes.

3/4 pound boneless pork tenderloin
1/3 cup barbecue sauce
2 tablespoons dry sherry
1 tablespoon soy sauce
1 teaspoon honey
1/4 teaspoon Chinese five-spice powder (can be made from equal parts of Szechwan pepper, star anise, cinnamon, cloves and fennel seeds)
1/4 teaspoon garlic powder
2 cups hot water
3 ounces buckwheat noodles
4 cups fresh broccoli florets

Thinly slice pork across the grain into 1/8-inch slices (easiest when partially frozen). In a 2-quart casserole, mix together barbecue sauce, sherry, soy sauce, honey, five-spice powder and garlic powder. Add sliced pork and stir to coat. Set aside. Place water in a 4-cup glass measure. Cover with vented plastic wrap and microwave on high 4-6 minutes or until water boils. Stir in noodles. Do not cover. Microwave on high 3 minutes. Set aside. Cover casserole of pork with lid or vented plastic wrap. Stirring midway through cooking, microwave on high 5-6 minutes or until pork is opaque. Drain noodles and stir in pork mixture. Place broccoli in separate casserole. Cover and microwave on high 3 minutes. Drain. Stir broccoli into noodle and pork mixture. Makes 2 servings. Can be frozen.

Kansas Honey Producers Cookbook

Experiment with herbs and spices –and with honey, of course. But just remember, one herbed or spiced dish in a meal is a taste adventure, but a meal with every dish herbed or spiced is a culinary disaster. BC

BEE TALK

richard taylor

"You can't become a really good beekeeper by just heeding the principles."

Beekeeping is an art, not a science. Formulae and set management practices do not work when it comes to apiary management. It's like gardening – people who are good at it are said to have a green thumb. They just sort of know what to do to get the desired result. I once knew a physician who decided to try gardening, except he was going to do it in a scientific way. The seed packet said to plant the seeds one-quarter inch deep and two inches apart, so he took a ruler to his plot, carefully made the furrows the prescribed depth, and measured precisely the distance between seeds. Later, his garden was overwhelmed by weeds, and he gave up. He had nothing of the art of gardening, and his scientific approach did more harm than good.

I've seen novice beekeepers approach their projects with the same incompetence, trying to apply fixed principles and procedures in the way of requeening, reversing, medicating and so on. But to be a good beekeeper, you have to know the limits of such procedures, how to work around them and when to more or less disregard them in order to meet the unexpected situation. In beekeeping, more than anything else I can think of, the unexpected is the norm.

For example, I have long stated that the fall honey flow should be left with the bees, especially if you are producing comb honey. And I am still convinced of that. But just how you carry that principle into practice requires judgment and art. What works one year may not work the next.

Now I shall illustrate what I mean by all this.

A good friend and beekeeper who doesn't get out to these parts very often was visiting me the other day, and we went off together to harvest some supers from my most productive apiary. It is a yard that I am pretty proud of, and I had put the bee escapes on the hives a couple of days earlier. We couldn't help noting the somewhat decrepit condition of most of my hives there, and I proudly showed him a couple of aged and rusty hive covers that were missing a couple of sides. But he also could not help noticing what was really important about that apiary, which is that the colonies were of overwhelming strength. It was a cool day – in the 60s – and bees were clustered on the fronts of half the hives. The comb honey supers we took off were filled up right to the corners. And there is, of course, a connection between those two facts. To get good crops, you need strong colonies, and indeed, you can't get good comb honey any other way.

How did I get my colonies so strong? By having them strong the whole year round – fall, winter, spring and summer. That's how you get honey, and that's how you minimize disease – strong colonies. The bees don't care if the equipment is old, and there are lots of things more important than the condition of a hive cover.

And how do you get strong colonies? By having the hives as heavy as lead in the fall. And that means letting the bees have the fall honey flow. Sugar feeding is no substitute for this. I never feed my bees. If the bees come into spring not merely alive, but with a good supply of honey still in the hive from the fall flow, then they will be strong right from the start of the season and, with reasonably effective swarm control, you'll get a good crop of honey. This is pretty much the theme of my talks when I'm invited around to speak to bee clubs, and I've said it before in this column, but it is not always easy to convince people.

But here is where what I said about beekeeping being an art comes in. Just how do you ensure that your hives are well provisioned with honey in the fall, without at the same time losing what might be a good honey crop for yourself from late flows?

I used to say, in response to this, that I did no supering after the first of August. Any supers still unfinished at that time were left on the hives to get finished, but I added no new ones. That is a neat, clear formula, but, as I realized this year, it has to be tempered with judgment. Art must take precedence over rules here.

Unlike most years, my bees were still storing beautiful honey well into August, before the Fall flowers had even bloomed. Well, I couldn't just leave them, so populous that bees were clustered all over the fronts of the hives, and with nectar in the fields to gather and no supers on the hives, no matter what my neat formula said. So, I kept adding supers, and the bees kept filling them almost as fast as I could get them on the hives. I found myself still adding a few new supers to some of my monster colonies right into September.

So what about that principle to add no new supers after the first of August? I simply abandoned it, of course. And now, as mid-September arrives, it looks like we are going to get our fall flow, and the bees will go into winter heavy as lead. That is what

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BEE TALK ... Cont. From Pg. 647

is important, not some fixed and quasi-scientific formula for keeping bees. Indeed, the hives are already heavy, quite apart from what is in the supers. I hefted a couple from behind, after harvesting the supers, and sure enough, they felt like they were full of rocks. Good! I checked one that I had thought, earlier on, might be queenless, and on which I had, accordingly, put no supers at all. I removed a couple of combs from the center and found them so full of honey that the colony had little room left for brood. But there was brood there, so it wasn't queenless; and that hive, while it is going to go into winter without much brood, will emerge next spring overwhelmingly strong because of all that honey, and I'll bet it will be one of my best producers next summer.

It is not hard to teach fixed principles of beekeeping. You need only to spell them out. But you can't become a really good beekeeper by just heeding those principles. You need, in addition, judgment, and skill in the art of beekeeping. That is much harder to teach and, indeed, I know that there are beekeepers who never get to that level at all. BC

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

Questions?

Organic Honey

Q **Do you think honey should be marketed as organic?**

Rich Drutchas
Montpelier, VT

A No, I think it should not, because the word has no meaning as applied to honey. A far better marketing approach is to affix a small label to the jar which might read: "This honey was gathered by the bees from floral sources in _____. Nothing has been added to it or taken away, and no chemicals were used in harvesting it." Strictly speaking, the bees gathered nectar, not honey, but that is not significant, and the description is consistent with having used terra and Apistan, since these were not used in harvesting.

Easy Winter

Q **Is there any way to overwinter small colonies, such as nucs?**

Ray James
Fairburn, GA

A I think one should never try to overwinter a colony that is low either in population or in stores. Lots of bees are needed to make a good winter cluster, and lots of stores for good spring buildup. Conditions might be significantly different in Georgia, however, where winters are not severe.

Wrapping Hives

Q **Does it do any good to wrap hives with black roll paper for winter?**

Burr Fassett
Hastings, MI

A Opinions differ on this, but I think it is a waste of time and effort. Sometimes, with the sun shining on that black roll paper, the colony gets too warm, and bees fly out and perish in the snow by the hundreds. I never wrap my hives. I consider that the main things for wintering are lots of stores, protection from wind, such as is provided by trees, entrance guards to keep mice out and ventilation to prevent moisture buildup.

Apistan Question

Q **The advertisement for Apistan strips states that Apistan does not contaminate honey, but the directions for using them say to "remove honey supers before application of Apistan strips and do not replace them until the end of the control periods." These two statements seem inconsistent. If there is no danger of contaminating the honey, why go to the extra work of removing the supers?**

Floyd Helm
Odon, IN

A Good question. These directions, like so many that are supposed to be precise and scientific, are confusing. They make it sound as if you should take all the supers off, set them aside someplace, insert the Apistan strips, and then, after the "control period," put the same supers back on the hives, which is, of course, absurd. My own practice, and, I believe, that of most beekeepers, is to put the strips in the hives after the season's crop has been harvested, that is, in the fall. This requires no additional removing and replacing of supers. Apistan, being a pesticide, should not be in the hives when the bees are storing honey, just on general principles.

Editor's Note: The EPA requires certain standards to be met when handling and applying pesticides. Generally, the term 'Safe when used according to instructions,' apply. And, considering that you are using a pesticide, common sense should prevail.

Varroa Problems

Q **All my hives seem to have Varroa mites. I put Apistan strips in on March 14 and removed them on May 8. By mid-July, after a good honey flow, I find the mites again on the drone larvae and pupae. Is a mid-Summer treatment necessary? Last year I treated them with Apistan in mid-Summer then harvested the goldenrod honey and treated them again beginning October 7 For three days the mites fell like rain. I could run my finger along the entrance and hundreds of mites would stick to it. That was only seven weeks after I had treated them. Is Apistan losing its potency?**

George Piper
Torrington, CT

A I have not heard any reports that Apistan is losing its potency or, which is the same thing, that bees are becoming resistant to it. Usually an Autumn treatment, when the bees have begun to cluster or become less active, is considered sufficient. I can only surmise that you are in a heavily infested area. Sometimes Varroa spreads rapidly when bees are moved in and out of areas by migratory beekeepers and pollinators. My guess is that this pest, like most others, is cyclical, and you can hope for better seasons to come.

Note: Questions are welcomed and should be sent to Dr. Richard Taylor, Box 352, Interlaken, NY 14847, not to Medina. Enclose a stamped envelope if you desire a direct response.

Answers!

Richard Taylor

?Do You Know? Answers

1. **True** All sperm produced by a drone are genetically identical; thus geneticists think of the drone as a flying gamete. The sperm are identical to each other, and they are identical to the chromosomes in the unfertilized egg that developed into the drones.
2. **True** Gynandromorphs are bees that are part female and are part male, sometimes referred to as sex mosaics. Gynandromorphs can be bilateral with one side male and the other female, or segmental where one end is male and the other female. Individuals can also have mosaic patches of different sexes throughout the body. Some gynandromorphs have functional male sex organs, and others may have functional female sex organs. Gynandromorphs have special uses in honey bee genetic studies.
3. **True** Honey bee queens mate with several drones, resulting in a complex structure of genetic relationships within a honey bee colony. There are usually seven to 10 subfamilies, depending on the number of drones the queen mated with. A subfamily would be a group of workers fathered by the same drone.
4. **True** Domestic animals have been selectively bred by human beings for thousands of years. Honey bee races, however, have not been strongly controlled and bred by man. Geographical races have resulted from natural selection and uncontrolled matings; thus, they are highly variable in their characteristics.
5. **False** In a successful instrumental insemination, the semen is placed in the medium oviduct and lateral oviducts. Then, through muscular contractions following insemination, the queen forces the semen from the lateral oviducts into the vagina. Here it is stopped by a valve-like fold of the vaginal wall, which causes it to be directed into the spermathecal duct, and finally into the spermatheca.
6. **True** The origin of drones from unfertilized eggs has the peculiar effect of making the drone's mother the genetic father of the drone's progeny. Drones have only daughters, no sons.
7. **False** The geographical area of the world that has the greatest number of races of the Western honey bee, *Apis mellifera*, is Africa. Not only does this area have the most races, it alsohas some of the best known, such as *Apis mellifera scutellata*, the African honey bee.
8. **False** When two inbred lines of honey bees are crossed, they often display superior characteristics known as hybrid vigor. This is the principle used in breeding hybrid bees. Each inbred line itself will exhibit inbreeding depression or loss of vigor.
9. **False** Mature reproductive cells (gametes; egg and sperm) each contain one set of chromosomes and are referred to as being haploid.
10. C) *Apis mellifera capensis*
11. D) 16
12. A) 25%
13. E) Tracheal mites
14. Buckfast Abbey, England
15. Instrumental insemination
    Isolated mating yards
16. Yugoslavia
17. Carniolan
18. They were believed to show some resistance to *Varroa* mites.
19. Climate, Predation Pressure
20. B) Temperate Honey Bees
21. A) Tropical Honey Bees
22. B) Temperate Honey Bees
23. A) Tropical Honey Bees
24. A) Tropical Honey Bees

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

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

Gleanings

NOVEMBER, 1995 • ALL THE NEWS THAT FITS

COLLINS TO BELTSVILLE

Dr. Anita M. Collins resigned as Research Leader for the Honey Bee Research Unit, Weslaco, TX, and moved to the Bee Research Laboratory, Beltsville, MD, under the direction of Dr. H. Shimanuki in early July, 1995. She accepted a Directed Reassignment to satisfy a strong personal need to relocate closer to her family. "Leaving Weslaco and a very fine group of colleagues was a very difficult decision," Collins said.

Her new assignment includes responsibility for developing germplasm preservation of honey bees to bring them in line with current technology for cryopreservation (freezing) of semen, and possibly embryos. She is also exploring the use of molecular genetic methods for the identification of sperm by subspecies and for Africanization. Successful results will lead to improved methods for maintaining variety in stocks of honey bees, and to aid in the selection of more effective, disease- and parasite-resistant colonies.

HONEY BOARD NEWS

The National Honey Board will participate in the 9th Middle East Food, Hotel & Catering Show and Salon Culinaire (MEFEX 96), January 13-16, 1996 in Manama, Bahrain at the Bahrain International Exhibition Center.

MEFEX is one of the region's premier food shows. MEFEX 96 is expected to draw over 5,000 visitors from throughout the Gulf and over 300 companies are expected to participate in this trade only event. The Middle East is one of the fastest growing agricultural markets in the world and heavily dependent on food imports. Within the region, the six countries of the Gulf Cooperation Council (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates) import almost $9.0 billion in consumer-ready food products annually. The Middle East is the largest market for U.S. bottled honey.

The National Honey Board has arranged for exhibit space at MEFEX 96 to promote U.S. honey and is inviting current or potential honey exporters to share its booth. Space availability is limited to three firms. Each firm will be charged $500 for exhibit space. In the event of numerous applications, selections will be made on a first come basis.

The Honey Board also invites exporters to display their honey products and promotional materials in the Honey Board's booth at no charge.

If interested, contact Linda Hampel at the National Honey Board office, 390 Lashley St., Longmont, CO 80501-6045, 800-553-7162 for details.

The National Honey Board will update its Export Directory this winter.

The Honey Board created the Export Directory booklet to assist international buyers to identify and locate sources of United States honey. The directory lists U.S. companies that export honey. Individual listings include such information as regions served, floral sources, sizes available, other hive products available (i.e., royal jelly, propolis), inventory available and shipping ports used.

Don't miss this excellent opportunity for exposure in the international marketplace. Contact Linda Hampel at the Honey Board office by December 31, 1995 to include information about your company in the directory.

WAS HONORS ERICKSON

Eric Erickson has been active in honey bee research, teaching and outreach for more than 20 years. He has authored more than 130 scientific and popular articles on honey bees and has been director of two USDA Honey Bee Research laboratories. From 1978-1986 he led the honey bee research program at the USDA lab in Madison, WI, where his research focused on problems of winter management, pollination, and pesticide mortality in bees. In 1986 he moved to Tucson AZ to become laboratory director of the Carl Hayden Bee Research laboratory. He is currently research leader, location coordinator, adjunct Professor of Entomology at the University of AZ, and a member of the University of Arizona Center for Insect Science.

In addition to his research and teaching activities he has been very active in public education. Since the arrival of Africanized honey bees in Arizona, Dr. Erickson has given dozens of talks to beekeeping organizations, schools, and local service groups. He has also served on innumerable committees devoted to raising public awareness about bees and to educate beekeepers and emergency response personnel.

MANN LAKE ANNOUNCES WAX MOTH CONTROL PRODUCT

Mann Lake Supply announced in mid-October they had received final EPA registration (#61671-2) for their paradichlorobenzine wax moth control product called Paramoth. The U.S. beekeepers have been without a wax moth control product for over a year due to registration and label acceptance problems brought about by stringent EPA regulations.

Paramoth™ is available in 1 lb., 5 lb., and 35 lb. containers from Mann Lake Supply in Hackensack, MN.

UTAH TRACKS AHB

The Utah Department of Agriculture began a five-month long effort in May to detect Africanized Honey Bees that may migrate to Utah. Last year the state conducted its first bee trapping effort and found none.

Utah Dept. of Agriculture entomologists placed about 100 specially designed traps along the Utah/Arizona border in late May to detect the presence of the Africanized bees. The so-called killer bees were first detected in the U.S. in 1990 in Texas. Since then the bees have migrated to parts of southern NM, AZ, and CA.

Utah Dept. of Agriculture Entomologist Ed Bianco says, "The possibility always exists that Africanized Bees could migrate to Utah this year, but the likelihood is remote." Bianco says most of Utah's winter climate is too harsh for the bees to survive throughout the year. But he says the climate in some areas of southwest and southeast Utah could support the bees. Africanized Bees are known for their aggressive behavior in defending their hives, and in the past have attacked animals and humans.

The USDA has allotted $15,000 to Utah to track the Africanized Honey Bee and to establish an identification lab at the Utah Dept. of Agriculture office in Salt Lake City.

INNER ... Cont. From Pg. 608

know it all. We, those who are paying the bills, are just smart enough to pay, but not quite smart enough to use the information we have paid for.

And that may be. My knowledge of DNA is limited, as I'm sure yours is. And how much do you know about the biochemistry of nectar? But does that mean we don't have the right to know what we're paying for? I don't think so.

The argument, of course, that's been used by those in the know is that all of this information is free and accessible to any and everyone who wants it. Right. When was the last time you picked up a copy of "The Journal of Economic Entomology," or "Experimental Acarology," or whatever, at the local magazine rack? And, if you have gotten ahold of one, was it in English, or at least in a language you could use? I don't think so, again.

Which is why I've always appreciated Roger's philosophy. He makes it a point to get what he (and his students) have learned to the people who can use it, in a form they can use. Thanks Roger.

Kim Flottum

Roger Morse Retires, Sort Of

Roger A. Morse, 68, retired on August 30, 1995 as Professor of Apiculture at Cornell University in Ithaca, New York.

Morse began beekeeping when he was 10 as a result of his hobby-beekeeper father's giving him a hive of bees. Actually, the hive was not a gift but a bribe to get the junior Morse interested in bees so that he would help his father with his hobby work. However, it was a bribe that worked and Roger began to build a library and read about bees and beekeeping. At one time, as a teenager, he kept 200 colonies in the Hudson Valley and Catskill Mountains of New York State.

After serving in the army, Morse entered Cornell as a freshman in the fall of 1947 where he earned B.S., M.S. and PhD degrees. When finished at Cornell, he was employed by the Florida State Plant Board as an apiculturist for two years and subsequently became an Assistant Professor at the University of Massachusetts where he remained for nine months before returning to Cornell as an Assistant Professor of Beekeeping in the fall of 1957.

During his career at Cornell his research on honey bees and travel has been financed by 14 grants from the National Science Foundation, several from the National Institutes of Health, the U.S. Department of Agriculture, the Food and Agriculture Organization of the United Nations, and one from the Army. His research has had to do with such diverse subjects as the sex attractant of the honey bee, swarm orientation and movement, alarm and attractive pheromones, honey wine and honey products, African and Africanized honey bees, and *Varroa* mites.

He has visited over 60 counties examining honey bees including six months in the Philippines working on the biology of *Apis dorsata*, the world's largest honey bee. He received an honorary doctorate from Academy Rolnicza in Poland for his work with researchers and beekeepers in that country. He has been a visiting Professor at the University of the Philippines, The University of Sao Paulo in Brazil, and the University of Helsinki in Finland. He is currently President of the International Bee Research Association and a Fellow in the American Association for the Advancement of Science and the Entomological Society of America.

Nearly 40 students have earned M.S. and PhD degrees under his direction. Several of these are now his counterparts in other states and countries and engaged in teaching, research, and extension.

Morse published his first article in *Gleanings In Bee Culture* in 1947, and at the urging of then-Editor John Root began his column Research Review in 1958.

Morse's chief reason for retiring at this stage, he says, is so that he can spend half of the year in a warm climate where it is possible to work active colonies in January. He has been hired back on a part-time basis by the College of Agriculture and Life Sciences for a period of three years. He is teaching this fall and over 100 students are taking his introductory beekeeping course while 25 are enrolled in the laboratory on practical beekeeping.

Roger and Mary Lou Morse have three children. Their son is a Professor of Entomology at the University of California at Riverside. Their oldest daughter is a supervisor in the Cornell Library system and their youngest daughter is a manager with an international company in New York City. The Morse's will continue to live on an unprofitable farm near Cornell and Ithaca that boasts 26 chickens, 21 sheep, 16 beehives, 14 horses, three dogs, and sometimes a cow or two.

At the present time, Roger Morse is concerned with assembling, in books, the world's literature on a variety of beekeeping subjects. He, his students, associates, and wife have authored 12 books, some of which have gone through several editions and been translated into several languages. He is currently working on three new books and two revisions.

USDA IN THE NEWS

Resistant Bees From Russia

U.S. Department of Agriculture scientists are looking to far-eastern Russia for honey bees that have genetic resistance to *Varroa* mites.

Thomas E. Rinderer of USDA's ARS said an initial analysis of bees collected in the Primorsky region indicates that they may be more resistant than their U.S. counterparts to the *Varroa* mite. Within U.S. honey bee colonies, the mite has taken a drastic toll since it came into the country from Mexico in the mid-1980s.

Rinderer said beekeepers in Primorsky only treat once a year for *Varroa* – U.S. beekeepers usually must treat twice – and that colonies in Primorsky had far fewer mites compared to U.S. colonies last fall.

"Honey bees and *Varroa* mites evolved in the Primorsky area over the last 100 years, so the bees may have developed resistance during that time," said Rinderer, research leader of the agency's Honey Bee Breeding, Genetics and Physiology Lab in Baton Rouge, LA. He, entomologist Robert Danka and technician Gary Delatte are working on the project in cooperation with Russian scientists.

Rinderer and colleagues traveled to the Primorsky region last fall to collect the honey bees and test them for resistance to the mites, *Varroa jacobsoni*.

Varroa attacks both adult bees and larvae. Young mites develop in the brood cells of the bee colony, sucking blood of bee pupae. The standard chemical treatment for *Varroa* is fluvalinate, a synthetic pyrethroid approved in 1988 for use against the mites.

But there are reports from Europe that mites are developing resistance to the chemical, Rinderer said. No other chemical treatments are approved for use against the mites in this country. Rinderer said many U.S. beekeepers would probably be forced out of business without some way to control the mites.

Reorganization Moving Along

The U.S. Department of Agriculture's reorganization and reinvention efforts have been effective and beneficial, according to Agriculture Secretary Dan Glickman. USDA is in the process of closing or consolidating nearly 1,200 of its 3,700 field locations and establishing 2,535 USDA service centers where USDA customers can receive one-stop service. Twenty-five percent of the designated locations will have closed or moved by the end of September. The timetable for closing or moving the remaining locations extends through fiscal year 1997. USDA began streamlining in the fall of 1994 by reducing the number of agencies from 43 to 29, in addition to staff reductions of 13,000 over the next five years. USDA reinvention projects have included a number of areas. Examples include: the biggest application of Electronic Benefits Transfer governmentwide to date in the food stamp program which is administered by USDA's Food and Consumer Service, the reduction or improvement of more than 80 percent of the department's regulations, the easing of the paperwork load and reporting requirements for farmers and ranchers. The paperwork project will result in a savings of 2.5 million hours annually of farmers' and ranchers' time dealing with farm program issues.

OBITUARY

Edward E. Southwick passed away on August 22, 1995 at his Brockport home. Dr. Southwick was an internationally recognized bee expert and taught at the State Univ. of New York at Brockport since 1977. He was also the founder and co-owner of Bee-1, which was created as a means for bee researchers to communicate and keep in touch around the world.

Raised in Midland, MI, Dr. Southwick held a bachelor of science degree in mechanical engineering and a masters degree in biology from the Univ. of Michigan. His doctoral degree was in physiological zoology from Washington State University.

Southwick died of pancreatic cancer; he was 52. He is survived by his wife, Alrun Southwick, and two daughters, one in San Antonio, TX and one in Ann Arbor, MI.

Send Us Your Notices At Least Two Months In Advance So We Can Publish Them In Our Calendar Section

EAS AWARDS WILSON, SAMMATARO

Wilson

Sammataro

EAS presented Bill Wilson, USDA honey bee researcher at Weslaco, TX with the Hambleton award, the highest honor awarded by the group.

Bill Wilson has added much to the knowledge of practical beekeeping during his career. This includes the research that led to the common use of the extender patty and terramycin for the control of American foulbrood. At Weslaco Wilson's work has focused on detection and control of both tracheal and *Varroa* mites, work with the Africanized honey bee both in Texas and Mexico and many other projects.

Diana Sammataro was awarded the 1995 EAS Student Award. She is a graduate student with Glen Needham and Brian Smith at The Ohio State University in Columbus, OH. Her work has focused on control of tracheal mites using vegetable oil and sugar patties, and documenting tracheal mite behavior on bees and in a colony. She receives her PhD in Entomology this fall and will continue her work on tracheal mite behavior biology and control.

EATING MORE FRESH FRUIT

Americans' consumption of fresh fruit hit a record high of more than 100 pounds per person in 1994. That was not enough to boost total per capita fruit consumption which fell to 276.5 pounds in 1994, from 278.2 pounds in 1993. USDA analysts say per capita consumption is not likely to post a substantial gain in 1995. Near-record citrus output is pressuring prices and boosting orange juice consumption. But noncitrus fruit production is down in some western states and export demand is high. California stonefruits, pears and strawberries were damaged by storms early in 1995, bringing shipments down and prices up. Fresh-market apple consumption is expected to decline in 1995 due to a smaller Washington crop and higher export demand.

Display Index

In Winter

howard scott

The solitary beehive in winter stands forlornly against the white expanse. The only sound is of bluejays perched on a nearby tree. The wind whips swirls of snow over the banks. I wonder – what is going on inside? How is the colony faring? How are the honey supplies holding up? Is the queen resting up for an active spring? Are the bees successfully coping with frost, moisture, debris, temperature control and disease? Will they survive?

The books tell us the bees go into their bowling-ball formation when the weather turns cold. They regulate their temperature by forming a two-to three-inch outer shell of active bees. The queen reigns in her central chamber at the core of the sphere. In colder weather, the cluster of bees contracts; in warmer weather, it expands. The sphere moves Pac-man-like around the hive, eating its stores of honey. In the early winter, there's a kind of homeostasis – a semi-hibernation. Then in mid-February, the queen begins to lay eggs, and brood tending begins in earnest. The core temperature must be a steady 92°F. The brood-tenders work to create the perfect balance of heat, humidity, liquid, disease control and pollen feeding to insure perpetuation. When the weather turns suddenly warm, the bees will fly out en masse for a cleaning and an awakening. This is a good sign.

This mysterious process invites questions: How do the bees keep the core at a consistenttemperature? What do they do during their down time? Do the bees age during that lull? Is the surviving population aged? What signal tells the queen to start laying eggs? How do the new bees know to gather nectar and pollen? Are the young bees taught by the older ones, the ones who were born in the fall? Or does all learning come from the queen? And how is learning conveyed when a new queen is created?

Meanwhile, on this frigid winter day, with the earth frozen, icicles hanging down over the top cover and a foot and a half of snow on the ground, I knock on the side of the hive. The hollow sound of my knuckles hitting the wood sends an echo over the back yard. No sign of life appears. For a second, I think of pulling off the top cover and reaching down into the hive to feel the pulsing life, but I resist the impulse. Instead, I lift up my wool collar as the cold begins to sting my cheeks. I walk away, hoping that all is well. Of course, my mittened fingers are crossed, for it's always a gambler's toss, no matter what precautions were taken.

As I head toward my house, I think back over years past to the signs of life that appeared through the winter. On warmish days, a few bees will emerge from the hive and fly around. Occasionally, I'll see some evidence of housecleaning, perhaps a spotting of dead bees in the snow beneath the entrance. And sometimes, on icy-crisp days when there is almost complete quiet in the neighborhood, I will place my ear against the hive and hear the unmistakable buzzing.

Of course, we never actually know what is going on in the hive, and sometimes there are surprises. I remember the one year I saw all these signs of life during the winter, and then when spring came, the bees did not emerge. I opened the hive and found a few sluggish bees meandering around on top of the inner cover, and nothing else. Since there were plenty of honey stores, it was disease that had ravished the colony. Upon inspection, I found decaying masses of bees that smelled like putrid vegetables. It felt like I was visiting a charnel house. There was nothing to do but start over again with a package.

When this happens, one always wonders: Was it my fault? Did I fail to observe significant signs? Did I take too much honey? Should I have left them another super? Did I medicate effectively? Were my grease patties thick enough? Did I install my Apistan strips too late? Should I have medicated with Terramycin? Should I have requeened at the beginning of the season? Should I have tried harder to catch a lost swarm and replant it in the hive?

Winter is downtime for beekeepers, it is true. Most of this season I ignore my colonies, but every so often, walking from bedroom to living room or taking the trash barrels out, I catch the white stacks, and the sight brings me up short. I think – out there in the frozen tundra, there is life, ready to burst forth, ready to begin anew.

Like alone and impregnable lighthouses, my beehives stand in the sea of snow, beaming the infinite possibility of life.

A.I. ROOT Middle School

On October 1, 1995, the Medina, OH, School Board held an open house and dedication of its newest facility, the A.I. Root Middle School. Named after one of Medina's most famous citizens the 128,000 sq. ft., $15,000,000 facility hosts the very latest in teaching technology

Present at the dedication were the entire Root family, parents and teachers and community members.

An aerial view of the nearly completed structure.

Speakers at the dedication were, L-R: Charles Irish, Medina School Superintendent; John Root, President, The A.I. Root Co., Thomas McKenna, A.I. Root Middle School Principal; and Jeff Eble, Medina School Board Business Manager.

John and Stuart Root display the plaque donated to the school, by The A.I. Root Co.

The plaque donated by The A.I. Root Co. is a bas relief of A.I. Root with a sample of an early Root hive in the background. It will hang in the school lobby. Several books on beekeeping, and the autobiography of A.I. Root were also donated.