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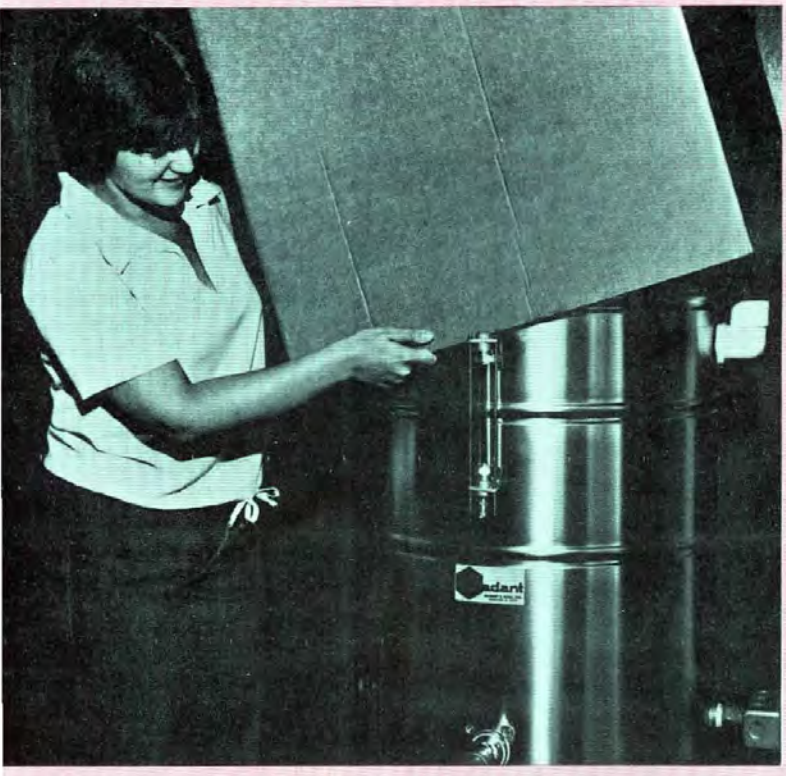

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GLEANINGS IN BEE CULTURE

Since 1873

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CONTENTS

Cover photo by G.A. Pauli

NOTES FROM THE BEEYARD

by Mark Bruner

ACARINE

CONFIRMED IN FLORIDA, NEW YORK AND SOUTH DAKOTA!

So far so good. That's what we thought, almost up to press time for this issue. Then -- word that Acarine infestation has been confirmed near Umatilla and Palm Beach, Florida, in New York, 20 miles south of Rochester; and in South Dakota, very near the Nebraska border. To complicate matters, authorities must now piece together the paths of migratory beekeepers who, it appears, unknowingly transported the pest to these states and, perhaps, to North Dakota as well. Emergency action orders have been placed on confirmed infestation areas, but eradication has been held pending additional surveying as well as the results of meetings, to be held within days, between government people and beekeepers relative to what can now be done in light of the fact that containment efforts have not succeeded as hoped for. What details are available at press time include the fact that the Palm Beach location is within flight range of thousands of other colonies, some of which are parts of migratory operations. The beekeeper in whose Palm Beach apiary the infestation was detected, had just moved his bees from North Dakota. Similarily, the New York beekeeper harbors his bees near Umatilla and migrates them to the Dakotas. A direct relation between these infestations and earlier ones in Texas has not been established but is possible, at least in an indirect sense of infestation due to geographic proximity of bees wintered in Texas. These new outbreaks present the need for re-evaluation of the containment and eradication concept adhered to thus far by the Animal, Plant Health Inspection Service (APHIS), as well as consideration of approval of chemical treatment methods.

According to APHIS officials, eradication of identified infested colonies in Texas and Louisiana has been completed (2,690 colonies in Texas, 188 in Louisiana, plus 6 feral colonies). Surveys on shipments of Chandler Apiary bees, suspected of possible infestation, have, to date, proven negative. In addition to the consequences of the newly confirmed outbreaks, there is concern about being able to provide adequate colonies for proper spring pollination in or near areas with infestation. These questions and others are being addressed in a number of forums. In Guadalajara, Mexico, mid-October, there will be a meeting, with U.S., Mexican and Canadian representatives to, in part, discuss the Acarine situation. *GLEANINGS* will be present and a report will follow.

In related news, Dr. William Wilson, U.S.D.A, Laramie, Wyoming, has been selected to prepare a proposal relative to chemical use in the treatment of the mites. Dr. Al Dietz, University of Georgia, was been given a grant to research regular management treatment techniques and identification procedures.

In that news of this situation is so rapidly unfolding, please consult all the major trade journals. Our publication times are different and, often, what you might not pick up from one, you might from another.

MORE THOUGHTS ON CHILDREN AND OTHER SMALL THINGS

PLUS, A SPECIAL OFFER TO BEEKEEPERS WHO ARE SERIOUSLY CONCERNED ABOUT THE FUTURE

Elsewhere in this issue there is an article you absolutely must read if you are concerned with the future of beekeeping. "Let's Buzz The Schools," by Steve Forrest, is about an effort, sponsored by the Southern States Beekeepers' Federation, to produce and distribute a kit to help beekeepers approach elementary schools and work with young people showing them how to appreciate the beauty and value of the honeybee. Mr. Forrest indicates how interested beekeepers can order a 49 page instructional outline which will, step by step, enable even a beekeeper who has never worked with a school class to present this subject in a meaningful way.

I have said it before, and I'll say it again: a young mind does not think something is beautiful or ugly unless it is conditioned to think as such. The message to beekeepers is straightforward: "If you don't do your part educating the next generation, someone is likely to come along and convince a good many of those impressionable minds that honeybees are an enemy rather than a friend.

At every conference I attend, I hear beekeeper after beekeeper complaining hour after hour about the problems of our industry. I admit that many of these problems are marketing difficulties, but I will also maintain that our public image weaknesses will not go away -- we will not cultivate a generation of new beekeepers -- we will not provide for our industry or the marketing of our products -- until such a time that all of us are living up to our responsibilities to educate our young people.

Sadly, despite the multitude of gripes, when I ask a congregation of beekeepers how many of them have gone to a classroom in recent months, very, very few respond affirmatively. Carol Tschida,

the American Beekeeping Federation's Honey Queen, recently related to a gathering of the Eastern Apicultural Society, that an overwhelming number of school aged children had never even tasted honey, let alone having been properly introduced to the world of the honeybee.

Why is this? We are a small industry, but unlike most other industries, beekeeping is represented in almost every town or county in the country. Within each of those towns and counties there are schools. One need not wait to be invited to speak at schools -- teachers will be quick to welcome a beekeeper who volunteers his or her time to work with kids.

Well, part of the reason, probably, is that folks feel uncomfortable about the idea of working in front of a bunch of students. That's understandable, but not unsolvable. The outline, mentioned above and, later, in Mr. Forrest's article, helps solve that problem -- it provides the means and the way to confidence in being able to make a classroom presentation. Remember, too, that so few people, let alone young people, know ANYTHING about bees and beekeeping, that your mere appearance with beekeeping equipment, honey samples and observation hive will probably be enough to prompt enough questions, from kids, to keep you talking a week. Young people, unlike many adults, are not as shy in asking for answers about things they are interested in. It's easier than you might think.

The other reasons that beekeepers don't go to classrooms is more unforgiveable -- they don't think it's important; they think they don't have time, etc. etc. Let me tell you, though -- if you have ANY serious committment to beekeeping's future, you had better care -- you had better make that small time investment in the next generation. Without that, our problems will only grow.

Think about it, folks --- this has to do with beekeeping and so much more. Bees, I think, represent something all too frequently ignored or abused by humans. Bees are small things. One of the many small links in nature's incredible web of life that we seem, at times, frighteningly willing to compromise or sacrifice in the name of "progress." It's not just bees, of course, but fish that are regarded as inconsequential compared to a power dam, or plants that are valued less than urban expansion and parking lots. The danger in such limited thinking is that we humans depend upon nature's web for our very survival. I wonder if we are as important to the rest of nature? Should we disrupt or neglect even the smallest vital link of that great network of life, we are the ones who stand to lose -- everything. Beekeepers, more so than perhaps many other humans, should know this, nurture it, and TEACH it!

A SPECIAL OFFER FROM *GLEANINGS*

By May 15th, 1985, school is winding down in most places. We'd like to offer a little something to encourage folks to get out into school rooms before then. Here's how it goes:

1. You must be a member of a national, state or local beekeeping association. If you're not, please join one or start one in your area. The cost of belonging to an association is trivial compared with what is to be gained by joining together to learn, grow and help each other.

2. After May 15th, but by June 1, 1985, send us a list including your name/the association you belong to/the schools you visited between now and then (elementary, junior, or high school), identified by name, location plus the number of groups you worked with and their grade levels. This is all on the honor system, folks -- nobody's going to confirm these sessions, but we know if you say it's so, it is! REMEMBER: COUNT BY CLASSROOM OR GROUP, NOT JUST BY ENTIRE SCHOOL. Send to:

GLEANINGS IN BEE CULTURE SCHOOLROOM PROGRAM
Box 706
Medina, Ohio 44258

To the beekeeper who has visited the most number of classrooms, we will donate one observation hive plus package of bees, suitable for installation at your favorite school. For the beekeeper with the second highest number of visits to schools, we'll forward 25 copies of our book *STARTING RIGHT WITH BEES* which can be given to school libraries or special young beekeepers. To the third most frequent school visitor, five wall charts depicting the life cycles of the honey bee. Additionally, all three top beekeeping teachers will receive a write up in *Gleanings*. We hope many of you, as individuals and associations, will join in to help the beekeeping educational process. We'll be talking about this in the future issues and look forward to seeing what comes of everyone's efforts.

LATE BREAKING ITEM: THE U.S. SENATE, LATE THURSDY NIGHT, OCTOBER 4th, PASSED THE HONEY PROMOTION MARKETING ORDER BILL, WHICH NOW REQUIRES ONLY THE PRESIDENT'S SIGNATURE. DESCRIPTIONS OF THAT BILL, WHICH PROVIDES FOR AN ASSESSMENT ON DOMESTIC HONEY WITH THE OBJECTIVE OF RAISING REVENUE FOR PROMOTIONS AND RESEARCH, HAVE APPEARED IN PRIOR ISSUES OF THIS MAGAZINE. ADDITIONAL SPECIFICS TO FOLLOW.

The Monthly Honey Report

October 10, 1984

The following figures represent the current prices reported by beekeepers and packers over the country. They are based on reports from many states averaged out for each region. Where insufficient information is received no price is shown. The retail prices represent the price of each size jar.

Wholesale Extracted — **Reporting Regions**

Sales of extracted, unprocessed honey to Packers, F.O.B. Producer. Containers Exchanged	1	2	3	4	5	6	7	8	9
60 lbs. (per can) White	42.00	42.00	42.00	40.00	36.12	39.00	36.00	36.00	40.80
60 lbs. (per can) Amber	40.00	40.00	40.00	38.00	31.62	33.00	30.00	35.50	37.80
55 gal. drum (per lb.) White	.65	.55	.57	.57				.56	58
55 gal. drum (per lb.) Amber	.54	.52	.50					.54	.54
Case lots — Wholesale									
1 lb. jar (case of 24)	28.50	24.00	24.90	25.92	38.40	24.00		27.00	25.50
2 lb. jar (case of 12)	27.50	22.80	23.25	23.76	34.80	22.25		24.50	
5 lb. jar (case of 6)	30.00	28.50	24.90	23.04		24.00		25.75	24.60
Retail Honey Prices									
½ lb.	.90	.90	.75	.85	.85	.90		95	.90
12 oz. Squeeze Bottle	1.50	1.30	1.35	1.19	1.50	1.25		1.39	1.30
1 lb.	1.50	1.50	1.45	1.42	1.85	1.40		1.59	1.50
2 lb.	2.70	2.60	2.65	2.62	3.55	2.50	2.25	2.89	
2½ lb.	3.35					3.00		3.29	
3 lb.	4.00	3.75		3.39	4.98	3.75	4.005	3.99	3.75
4 lb.	5.00	4.90		4.99		4.75	4.70	5.79	
5 lb.	6.00	6.00	5.35	5.39		5.50	5.40	5.99	5.25
1 lb. Creamed			1.45				1.50	1.74	1.50
1 lb. Comb	2.25	2.25	2.25		1.95	1.75	2.10		2.25
Round Plastic Comb	1.75	1.75	1.85				1.75		1.50
Beeswax (Light)	1.35	1.35	1.50	1.40	1.25	1.50	1.15	1.15	1.35
Beeswax (Dark)	1.30	.1.15	1.35	1.25	1.15	1.40	1.05	1.10	1.15
Pollination Fee (Ave. Per Colony)	24.00	20.00	27.50	18.00	19.00		19.00	19.00	25.00

MISCELLANEOUS COMMENTS

REGION ONE

Connecticut beekeepers are helping the State Dept. of Environmental Protection in a mutual effort to reduce damage done by improperly applied insecticides. A hearing date has been set for Nov. 9th. Very little honey in CT this year, despite reasonable weather. Bees in great shape, though.

REGION TWO

Slow but steady honey flow from goldenrod in New York. Gains in the 35 pound neighborhood. Ground is dry but weather continues to be good. Grocery store prices holding, but about 20-49 cents less in farmers' markets. West Virginia reports cool nights and sunny days with super fall flow. Sales brisk and prices up slightly. Maryland's crop is somewhat less than last.

year. Honey being sold much higher because of black locust. Tulip polplar failed because of rain. Sales of honey doing well. Aster and goldenrod out, but rain needed, especially on eastern shore. PA reports honey sales way off and a poor fall flow. Too much rain there.

REGION THREE

Fall flow progressing nicely in Illinois. Wholesale sales to institutions feeling effect of government give-a-ways. Very little fall flow in Wisconsin. Crop there is spotty with good yards only miles away from bad ones. Very little U.S. honey being offered. Bees in Indiana have only a fair crop of poor quality honey. Plans to increase queen rearing due to Acarine outbreaks in the south.

REGION FOUR

Missouri colonies good since the last of July. Dark honey. Sales slow. North Dakota reports crop disaster in the west, with some areas having five inches of rain for the year. Sunflower averages up somewhat but insecticide problems wiped out manya field forces. Overall crop about 70 percent of normal. Generally dry; outlook for fall germination of sweet clover not good. Some beekeepers extracting brood chambers. One Twin City bottler offering 54 cents per pound light honey, drums returned F.O.B. his dock. Retail sales extremely slow. Some fall feeding required.

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Gleanings Mail Box

The Swedish & Russian Beekeeping Tour Is A Success

Dear Editor:

Nine Americans recently returned from a beekeeping tour of Sweden and Russia organized and led by Borje Svenson. Mr. Svenson is a young Swedish commercial beekeeper who operates Bikonsult,' an apicultural consulting company in Sala, a small town northwest of Stockholm. He has had years of experience organizing beekeeping trips throughout Europe. His numerous contacts and language abilities plus a wonderful personality makes him a natural leader for beekeeping tours.

After assembling in Sala our trip took us to Uppsala, Stockholm, Helsinki, Estonia, Leningrad and back to Stockholm. We were joined by about 20 Swedish beekeepers for the Russian portion of the trip. We saw many historical sights in Sweden and in Russia and had the opportunity to visit many beekeeping operations and stores. Beekeeping methods and equipment observed on this trip varied widely. Standardized equipment such as in use in the U.S. is not a characteristic of European beekeeping. Even though Sweden is free of varroa mites, this destructive mite was observed close hand in Estonia. Effective control of this pest has proven very difficult and many losses are occuring. Not many Americans have had an opportunity to observe the varroa mite and our conclusion is that this is a beekeeping problem that we must somehow avoid.

The only disappointing feature of the trip was the lack of cooperation of the Leningrad Intourists Office to take us to the beekeeping facilities in the Leningrad area which had been promised earlier. As the leader of the China Apiculture tour during the summer of 1983 I could appreciate this problem because such things also happened to our group.

Mr. Svenson has indicated that another Scandinavian beekeeping tour might be possible during the summer of 1985 that would include sightseeing and beekeeping activities in Norway and Sweden. The cost would be modest for a two week tour. More details will be available later this winter and spring. If interested, please contact: **Harold Liberman, 2701 Oxford Circle, Upper Marlboro, MD 20772. Ph: 301-627-4777.**

Smokers

Dear Editor:

The letter in the August issue of *Gleanings* about the fire started by a smoker has prompted me to write this.

As a profession or hobby, beekeeping is a pretty safe venture. A few stings here and there, the possibility of a pulled back if we're not careful, but not much else to be cautious about — except our essential smoker. As summer progresses, grasses and brush get drier and drier, and the potential for danger and possible disaster increases.

Here are a couple of tips: Light the smoker carefully and puff the bellows so that a sudden gust won't send flames up to your eyebrows (which has happened to me). Equally important, get an old cake pan or something similar and get in the habit of always placing your smoker in it when it is not in use. **J.J. H., Brattleboro, Vermont 05301.**

Pen Pals

Dear Editor:

I would like to contact pen pals in your country and would like to if convenient for you to put my name and address in your journal. My name is Cathy Allan and I am 19 years old. My hobbies are horseback riding and beekeeping. I would like to write to a male or female around my age.

Cathy Allan
C/O Mr. A. Taylor
Conness St.
Chiltevn Victoria
Australia 3683

Hiving A Feral Colony

Dear Editor:

I am writing about your March 1984 edition which contained an article on pages 152 and 153 by Mr. W.B. Chappell entitled "Tree To Hive In Six "Easy" Steps". I read this article with great interest and at the time of reading hoped for a chance to try this method myself.

In late June of this year I learned of a colony which had taken up residence in a dwelling house. The bees had gained entrance to the wall cavity through a crack created by a broken piece of fascia board. This entrance was above the front porch about 10 feet above the ground. Needless to say the owner of the house was anxious to have the bees removed. After explaining the removal procedure which I planned to follow the owner was very willing to grant me permission to try for the bees.

It took me about five weeks total to capture the colony and I consider it a rousing success. About the only problem I encountered was in stopping up the many cracks and other entrances the bees seemed to find after the wire cone was in place. This was primarily caused by the shiplap siding on the house and the rotting fascia board.

It is now the first of September and the colony is thriving very well. I plan to use this method whenever I have the opportunity in the future.

Thank you for such an informative and practical article. **Bill Hoskins, Route 4, Box 139N, Batesville, AR 72501.**

In Response to Dr. Taylor's Storage Recommendations

Dear Editor:

I am writing to comment on the Questions and Answers column of *Gleanings*, September 1984 issue (page 472). The question submitted was: "What is the recommended way of having bees clean supers in preparation for storage?" The response by Richard Taylor was: "Just stack them out in the yard, and soon there will be a great cloud of bees licking the combs dry, and when the bees are through with them, you can store them away."

I adamantly disapprove of this method, for it is an ideal way of initiating robbing and acquiring disease. I cannot imagine a more efficient manipulation of attracting foraging bees that may be harboring spores of *Bacillus larvae* (etiological agent for AFB), as well as other diseases. I have witnessed intense attempted robbing, robbing, and violent fighting after open-air feeding of honey, and it was quite dreadful indeed.

Please allow me to quote several sections, enacted for obvious reasons, from the Food and Agricultural Code of California — State of California Department of Food and Agriculture, Division 13 — Bee Management and Honey Production, Chapter 1, Article 8, Section 29216: It is unlawful for any person to extract or render any honey, pollen or wax from comb ex-

Continued on Page 601

Soybean Pollination and Honey Production — A Research Progress Report [1/]

by ERIC H. ERICKSON, Jr. North Central States Bee Research Unit, USDA-ARS, Madison, Wisconsin

In late 1978 the North Central States Bee Research Unit, USDA-ARS, Madison, Wisconsin was the recipient of a special congressional appropriation in the amount of one-hundred thousand dollars annually for the study of soybean polination[2/] This appropriation was initially requested by the American Honey Producers Association whose members took the lead in guiding it through Congress. Because of widespread interest and support, an informal coalition of beekeepers from many states lent their support in a variety of ways and assured eventual passage of the appropriation.

Now, five years later we submit a progress report to those who supported this research, and to the American beekeeping public. For easy reference, we have provided a complete list of publications emanating from our soybean/honey bee research with those which were funded specifically from the special appropriation indicated by an asterisk. A narrative summary of our research on soybean pollination and honey production and follows there-after.

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5. Erickson, E.H., Berger, G.A., Shannon, J.G. and Robins, J.M. 1978. Honey bee pollination increases soybean yields in the Mississippi Delta Region of Arkansas and Missouri. *J. Econ. Ent.* 71(4): 601-613.

6. Erickson, E.H. 1978. The status of hybrid soybeans. Proc. IVth Int. Symp. on Pollination. Md Agr. Exp. Sta. Spec. Misc. Publ. 1: 25-28.

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* 8. Erickson, E.H. and Robins, J.M. 1979. Honey from soybeans: The influence of soil conditions. *Amer. Bee J.* 119(6): 444-445, 448-450.

* 9. Rust, R.W., Mason, C.E. and Erickson, E.H. 1980. Wild bees on soybeans, *Glycine max*. Environ. Entomol. 9(2): 230-232.

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FIG. 1. Honey bee gathering nectar from a soybean flower.

*13. Robacker, D.C. Flottum, P.K. and Erickson, E.H. 1982. A heat exchanger for soil temperature control of potted plants. Agron. J. 74: 147-148.

*14. Severson, D.W. and Erickson, Jr., E.H. 1983. Variation in soybean (*Blycine max* (L.) Merrill) floral characteristics relating to honey bee (*Apis mellifera* L.) foraging preferences. Paper presented before North Central Branch of Entomological Society of America, St. Louis, MO.

*15. Severson, D.W. 1983. Honey bees and soybeans: Analyses of floral chemistry relating to foraging preferences. Ph.D. Thesis. University of Wisconsin, Madison, WI. 129 pp.

*16. Severson, D.W. and Erickson, Jr., E.H. 1983. High performance liquid chromatography of carbohydrates in cucumber nectar. J. Apic. Res. 22(3): 158-162.

*17. Erickson, E.H. 1984. Soybean floral ecology and insect pollination. Soybean Genetics Newsletter 11: 152-162.

18. Robacker, D.C. and Erickson, Jr., E.H. A bioassay for comparing attractiveness of plants to honeybees. (In preparation).

*19. Robacker, D.C., Flottum, P.K. and Erickson, E.H. Soybean flower aroma: Chemical messages for pollinators? (In preparation).

*20. Severson, D.W. and Erickson, E.H. Quantitative and qualitative variation in floral nectar of soybean cultivators in southeastern Missouri. Environ Entomol. (In press).

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BACKGROUND

Soybeans, one of the five vital grains of ancient China (the others being barley, millet, rice and wheat) are the major agricultural product of the modern world. Their importance is reflected in the fact that in 1981 more than 51 million hectares (about 126 million acres) of soybeans were grown worldwide on an estimated 4 percent of all agricultural lands. Moreover, world soybean hectarage has increased 72 percent in the ten years from 1971 through 1980. In the United States, where they first achieved crop status in the early 1900's, soybeans are now the leading cultivated crop commanding up to 25% of the cropland in some areas. Since the early 1950's, the United States has committed more land to soybeans than any other country and in 1980, harvested more than 27 million hectares (67 million acres) of soybeans; followed by Brazil (8.9 million hectares) and China (7.3 million hectares). Presently, the United States produces 66% of the total world soybean crop.

The explosion of interest in soybeans has resulted in a spectacular agricultural growth for countries like the United States and Brazil. Other countries will surely follow. The driving force behind this growth has been the number and diversity of products derived from this single farm commodity. Soybean products include those used for food (e.g. salad and cooking oil, shortenings, margarine, protein supplements, baby food, artificial meats and cheeses, soy sauce, and edible beans); for animal and honey bee feed (e.g. whole and cracked grain, meal, and finely ground protein supplements); and in industry (e.g., oils, plastics, resins, paints, varnishes and in products for chemistry) just to name a few.

The cultivated soybean is an herbaceous annual, with uncertain ancestry. Most believe that its origin was in Eastern Asia, probably Northeastern China, where it was first cultivated about the 11th Century B.C. Like corn, the soybean may have been selected and bred by ancient man from a more primitive form that was different in growth habit and floral development. Existing primitive soybeans and the cultivated soybean may be the same species or perhaps, the ancestral soybean species has been lost.

Continued on next page

Among the traits that may have been altered through man's selection and breeding is the soybeans' natural pollination syndrome. This could have occurred because selection of the cultivated soybean out of its wild parent was likely carried out in agricultural areas relatively free of insect pollinators. Hence, unwitting selection against bee pollinated types in the modern soybean would have been made. Couple this conjecture with numerous observations of good crop yields in the apparent absence of bees, and it is not surprising that many believe that bees cannot influence soybean yields. However, those who hold this view overlook four key points: 1) that the structure of soybean flowers definitely encourage bee visitation with concomitant pollination; 2) that bees forage extensively in soybeans; 3) that, in the past, studies regarding the relative effect of pollinating insects on soybeans were usually conducted without knowledge of pollinator populations at the study site(s); and 4) that in the absence of an identified wild progenitor there has been no consideration given to the pollination of the ancestral parents of the cultivated soybean. We do know that a related species is insect pollinated.

The subject of honey bee foraging on soybeans has long been immeshed in controversy, and debated publicly for more than 50 years. There are those who have steadfastly maintained that bees do visit soybeans to gather nectar and pollen (and perhaps pollinate them) while others hold the opposite view with equal conviction. Both observations may, in fact, be accurate.

A somewhat complex picture of interactions between soybean cultivar and environment seems apparent. At certain locales and under certain circumstances foraging by bees on soybean cultivar may be extensive; at other locales, it may be limited or nonexistent. As a result, floral nectar may or may not be secreted and bean yield may or may not be affected.

RESEARCH PROGRESS

Soybean Flowers

Certain cultivars of soybeans are more extensively visited by bees and produce greater quantities of nectar and aroma than do others. Moreover, since soybean cultivars are restricted geographically to narrow latitudes based upon rate of maturation, those cultivars known to be preferred by bees in one area may or may not produce nectar or aroma and therefore may not be attractive to bees at other localities. Hence, when referring to soybeans one must consider the specific cultivar involved. Cultivars grown within the range of their maturity group seem to elicit the most intense bee/flower interactions.

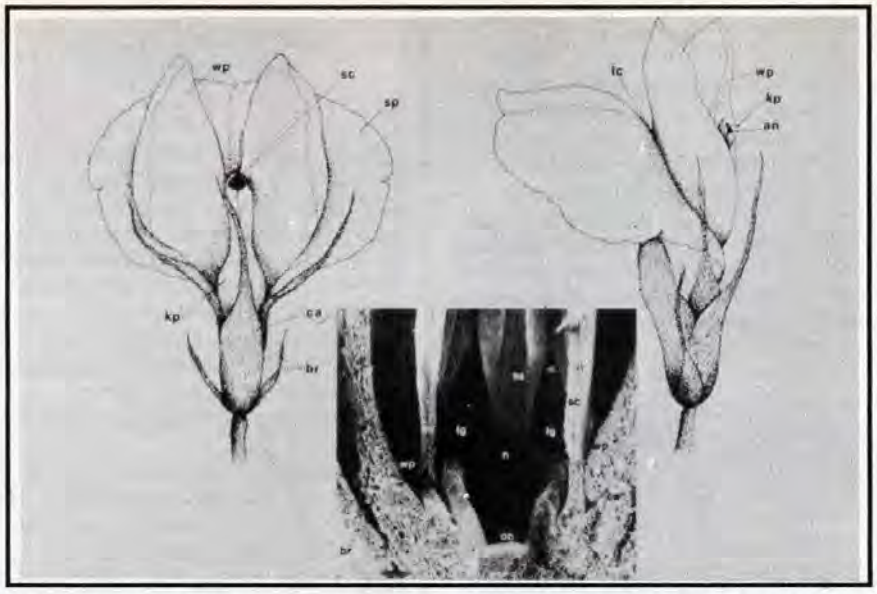

FIG 2. Drawings of a soybean flower with center photograph (magnified 25 times) inset to show the nectary and its position in the flower. Abbreviations are as follows: an—anther; br—bract; ca—calyx; kp—keel petal; n—nectary; ob—ovary base; sc—staminal column; sp—standard petal; ss—single stamen; tc—tongue channel; tg—tongue guide; wp—wing petal.

Other factors further contribute to optimal floral development and pollinator foraging. Soybeans have long been and in some areas are still considered a secondary crop, grown only in deference to other row crops such as corn and cotton. For this reason, perhaps more than any other, the best soybean husbandry practices such as optimizing plant density and nutrient fertilization have not always been followed. For example, many farmers do not follow existing recommendations and adjust their planter to narrower rows for soybeans after planting corn or cotton. And frequently, farmers plant their best land to other crops giving their fields of lesser productive capacity over to the beans. Poor crop husbandry contributes to reduced bee visitation due to altered bee foraging cues and rewards.

The Flower

The soybean flower is variable in size among varieties: some are long and relatively narrow while others are short and broad. Petal color ranges from white through mauve to purple, yet most cultivators possess pigmented flowers. Each zygomorphic (petals are unequal in size) flower has five petals (Fig. 2). The standard petal is bound on either side by a smaller wing petal while two tightly clasped ventral keel petals partially enclose the sexual column.

Previously published depictions and descriptions of soybean nectaries create confusion because of their inaccuracies. It is quite clear that soybean blossoms possess most, if not all, anatomical characteristics of bee-pollinated flowers including: 1) nectar guides (both in the visible and ultraviolet spectra), 2) a characteristic aroma (detectable at higher temperatures, e.g. above 27°C = 80°F), 3) a tongue channel and guide (for pollinators — probably bees), and 4) a highly differentiated nectar (Fig. 2) that produces substantial quantities of nectar. Preliminary data suggest that floral aromas may inform pollinators of flower prereadiness, readiness and post-readiness for visitation (pollination) with separate chemical messages. Further studies are now underway to identify and bioassay flower volatiles and to confirm this concept. The stucture of the flower and the approach behavior of the foraging bee insure that bees will contact the sexual parts of the flower whether gathering nectar or pollen. Yet, in cool climates or during cool weather the flowers of most soybean cultivars never open (are cleistogamous) and hence are inaccessible to bees.

Two to 35 flowers are borne in racemes (clusters) at the nodes of the stem and branches. They first open at the base of the raceme and then open progressively upwards. Each soybean flower is open for only a single day but from one to 13 may be open simultaneously on a raceme, depending upon the cultivar. When the leaf canopy is moved aside multi-flowered cultivars appear quite showy. The number of flowers produced per hectare is highly variable among cultivars. A soybean field is usually in bloom for four to six weeks and in agricultural areas where early and late adapted cultivators bloom in succession, a six to nine week flowering period ensues.

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Nectar

Soybean blossoms have functional nectaries. Each flower of most cultivatars produces only slightly less nectar than alfalfa in northern regions. Sugar concentrations in soybean nectars are 5-10% higher than those of alfalfa when growing conditions are favorable. We see similar variability among cultivars in nectar production and attractiveness to bees in both southern and northern regions of the United States.

In the central United States soybean nectar production, and bee visitation , occur between 0900 and 1500 h (9:00 a.m. — 3:00 p.m. each day. Peaks in these activities, like the time of day when the flower is first fully open, may vary depending upon the cultivar and local weather conditions. Soybean nectar volume per flower, greatest in warmer climates, varies significantly among cultivars ranging from none to 0.2 microliters per flower, with some flowers having as much as 0.5 microliters (Note: the honey stomach of a worker honey bee holds 35-50 microliters).

We and others have examined soybean nectar and reported a mean nectar sugar content of 37.0 to 45.0 percent. In Missouri and Arkansas, the total carbohydrate content in soybean nectar varied from 301 to 1354 micrograms per microliter of nectar and from 15 to 134 micrograms per flower. Floral sugar concentration increased but volume decreased with time of day and temperature. Nectar sugar ratios (e.i. fructose: glucose: sucrose content) differ among soybean cultivars as well as with time of day within a cultivar. We noted no differences in carbohydrate content between purple and white flowered cultivators. Earlier in Wisconsin, nectar production from flower to flower appeared to be most consistent in volume and carbohydrate content among white flowered cultivars, hence, white flowerd cultivars were judged more attractive than purple cvs. But later work in Missouri seems to dispel this notion.

Pollen

Honey bee collection of soybean pollen is highly variable as is cultivar's ability to produce quantities of pollen. Little soybean pollen may be gathered by bees in some areas. However, soybean pollen may comprise more than 50% of the total quantity of pollens gathered by many bee colonies. Soybean pollen pellets taken from the corbibulae of foraging bees are easily recognized by their grey-brown color, small size and compaction.

SOYBEAN HONEY PRODUCTION

Many species of bees, including honey bees (Fig. 1.), forage soybeans for nectar and pollen. Honey bee populations may exceed a density of 1 bee per meter (= 3-3 ft.) row during peak foraging. Working in cooperation with others, we reported 29 additional species of bees that forage soybeans in three regions of the United States. The pollination contributions of, or benefits to bees other than honey bees foraging soybeans are unknown.

Beekeepers, particularly those in the central and southern United States, have been obtaining substantial yields (70 to 90 kg = 150 to 200 pounds per colony) of light amber honey from soybeans for decades. In so doing they have identified those agricultural lands where ample soybean honey production can be expected as well as those areas that are of unreliable or nonexistent productivity. There is little doubt that many beekeepers unknowingly harvest large quantities of soybean honey. Often, soybeans are not exploited by beekeepers for the production of this honey which has a distinctive aroma and flavor and is easily identified with experience.

Nectar production in soybeans as in other plants is dependent in part upon weather. During cool periods mature flowers remain partially or fully closed and have no nectar. In 1973 I was able to observe that plants in more northern climates (e.g. Wisconsin) required three days to recover the ability to produce nectar, following a period of cool weather even though subsequent flowers were open each day. The quantity of nectar produced per flower following cool weather usually will not reach the level that was present during the preceding favorable period. Temperatures above 22-24°C (= 72-75°F) are required to insure soybean nectar production.

Intuitively, the most vigorous plants given optimal plant husbandry should produce the greatest quantity of nectar. Since most of the basic components of nectar, including sugars, are products of photosynthesis, the healthiest plant receiving the maximum amount of light and grown in the most suitable soil is likely to be the greatest producer of flowers with quality nectar and aroma and thus be the most attractive to foraging bees. Other researchers have shown that soybean seed yields are sensitive to the presence and availability of certain soil nutrients, soil pH, (a pH level of 6.0-6.5 is considered optimum) and soil moisture, as well as sunlight. Optimal soil pH and soil fertility are vital to the physiological well-being of the plant, as well as its ability to produce flowers, nectar and aroma and probably its response to bee pollination.

Soil texture, too, is important since it affects nutrient retention, soil moisture availability, and root penetration. In southern Missouri, others have shown that sandy, coarse loamy, and coarse silty soils provide the least amount of available water to the plant followed by the clayey soils; the fine loamy and fine silty soils supply the greatest amount. Moisture stress reduces photosynthesis as well as flowering and pod filling. Coarse soils are readily leached and so are usually acid and low in fertility. Fertility can be restored to these lands, but unless good crop husbandry is practiced, our studies show that nectar secretion and resultant honey production is likely to be poor (10-20 kg = 22-24 pounds per colony). Heavier soils are less acid, more fertile, and retain their productivity partly because they are difficult to till. As a result, crop yields are usually high (2.6-4.3 kl/ha = 30-50 bu/acre), and our experience has shown high soybean honey yields (90 kg = 200 pounds per colony) can also be expected. Similarly, nectar secretion in various other plant species has been shown to be adversely affected by low soil moisture availability, low soil nutrient availability, and low pH. Nectar secretion is generally low on soils with either too much or too little drainage (Table 1).

Table 1. Honey production in relation to soil conditions

	Low Honey Production 13.5 kg (30 lbs.) per colony	High Honey Production 90 kg. (200 lbs.) per colony
Soil pH	below 5	above 6
Fertility	low	high
Structure	coarse (sandy)	relatively fine (loamy)
Water holding capacity	low	high
Soybean yield	0.9-2.2 kl/ha (10-25 bu/acre)	2.6-4.3 kl/ha (30-50 bu/acre)

Our data from studies conducted in a controlled environment facility demonstrate that plant/flower characteristics, indicating greater plant vigor, were optimal at the in-

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Table 2.

Distance from apiary	Average number of seeds per sample* Arkansas	Missouri
5-15 meters (16.5-50 ft.)	785a**	836a
20-35 (65.6-115 ft.)	839a	931a
50-65 (164-213 ft.)	619b	776a
85-100 (279-328 ft.)	630b	529b
115-150 (377-492 ft.)	594b	

*** Each sample consisted of all seeds from 10 plants**

**** Within columns, values followed by different letters are significantly different at the .05 level.**

termediate day and night air temperatures (28 and 22-26°C = 82.5 and 72-79°F), the higher soil temperature (28-32°C = 82.5-90°F), and the higher (175 ppm) and lower (15ppm) soil concentration of nitrogen (N) and phosphorous (P), respectively. Bioassays showed that honey bees preferentially visited soybeans that had more flowers which produced greater quantities of nectar. The predominant environmental factors contributing to attractiveness of soybeans to bees were moderate and high air temperature and high and low soil concentration.

BEE POLLINATION OF SOYBEANS

Soybeans are classified as self-fertile and automatically self-pollinating. It is said that pollination may occur before the blossom opens. Moreover, large numbers of fertilized and unfertilized flowers (more than 75% in some cultivars) drop off the plant and do not set seed. Thus, it would appear that soybeans normally set a full complement of seed and therefore have little biological need for insect pollination among cultivars and hence little need for the kind of floral development characteristic of insect pollinated plants. Indeed, many argue that such is the case. Others believe some outcrossing would be beneficial. The question is; how much interfloral pollen transfer both within and between cultivars occurs naturally.

One must now wonder whether the earlier observation that soybeans self-pollinate before the flower opens may have involved a misunderstanding of cleistogamy and the fact that soybean blossoms are open for only a single day. Our studies in the controlled environment found that only thirty three percent of the 'Mitchell' soybean flowers examined were completely self-pollinated 3.5 hours after the onset of photophase (artificial dawn): fifty-eight percent were self pollinated 6.5 hours after the photophase began. These results suggest that early in the day soybeans exercise a cross-pollination strategy which is followed by a self-pollination strategy later in the day. Follow-up field studies are now needed to examine this aspect of floral development under field conditions. If corroborated, we should expect that the timing of these strategies may vary with the cultivar's relative abundance of pollen and with other factors as well.

Our studies have shown that bees may increase soybean yields by as much as 20 percent for plots caged with bees vs caged without bees. I demonstrated a yield increase of 13.9 percent for the cultivar 'Corsoy' in 1971 and 5.2 and 16.3 percent for 'Hark' in 1972 and 1973 in Wisconsin. In the Mississippi Delta, we obtained a combined yield differential of 21.6 percent on the cultivar 'Pickett' at two study sites in Arkansas and Missouri in 1975. Here significant differences in the numbers of filled and empty pods were also noted. These differences were attributed to increased pod set since seeds per pod and weight per seed did not vary. These results have since been corroborated by scientists working elsewhere in the United States and abroad.

In open fields trials in Arkansas and Missouri, we obtained significant yield differences between that side of the field near the apiary versus the far side of the field. These data compare favorably with subsequent data sets: All show a high yield near the bees (5-15 m 16.5-50 ft from the apiary), a still higher yield at 20-35 m (= 65.5-115 ft) and then a progessive decline at greater distances from the colonies (Table 2). Similar patterns are common in other insect pollinated crops.

In other studies soybean yield differences due to bees have not been noted. We were unable to show significant yield differences in five cultivars ('Hark', 'Williams', 'Illini', 'Wayne' and 'Mukden') over three years although caged treatments with bees were usually slightly above those caged without in total beans and pods. Some cultivars during some years did show a significant difference in numbers of beans per pod. These studies were conducted in an area of southern Wisconsin on land of much higher productivity than the earlier trials with 'Corsoy' and 'Hark'.

Soybean cultivars are often identified as being determinant (cease vegetative growth before beginning to flower) or indeterminant (flower while continuing growth). But in reality all soybeans are indeterminant but individual cultivars vary in their tendency towards determinancy with later maturity group cultivars tending to be more determinant. I have yet to discern differences in foraging by bees or yield response resulting from bee pollination that can be explained based upon level of determinancy at flowering.

HYBRID SOYBEANS

The development of hybrid soybeans is a topic of interest both for beekeepers and plant breeders as well as others in agriculture. Substantial interest was generated after the discovery of genetic male sterility in soybeans. Others have attempted and are working to produce soybean hybrids. The present status of hybrid soybeans is uncertain as genetic male sterility presents some difficult problems if it is to be considered for commercial development of hybrids. Other forms of male sterility better suited for commercialization are yet unknown in soybeans. Once male sterility is discovered, inadequate pollination will likely be a major factor in limiting the production of hybrid soybeans just as it has limited hybrid production in other crops.

Whether hybrid soybeans will become a commercial reality remains to be seen. Some researchers feel that it is just a matter of time; others think it unlikely. Certainly hybridization would contribute substantially to the research programs of plant breeders by reducing the necessity for hand crossing and for obtaining large-scale out-crossing for recurrent selection. Meanwhile, our soybean flower-pollinator data will facilitate the development of soybean hybrids. Pubic and private soybean

Continued on next page

breeders are currently using our research results. If hybrid soybeans become a reality, plant breeders must pay strict attention to floral characteristics and include selection for pollinator cues and rewards to ensure floral compatability between seed parents in their breeding programs.

CONCLUSIONS

Our data indicate that bees produce substantial honey crops from soybeans and may increase soybean yields in some fields/localities but not in others. Hence, the convictions of those on both sides of these issues appear equally valid. Regardless of opinions to the contrary, many soybean growers continue to encourage beekeepers to locate apiaries near their fields and report increased yields with bees present.

Differences in soybean honey production and soybean yield due to bee pollination seem attributable in part to heritability factors and to environment. Interpretation of all bee-soybean data suggest that greatest honey yields occur on the most productive soils in warm climates, while soybean yield increases resulting from insect pollination have been highest on poorer soils. Further research is needed to clarify these hypotheses. Some cultivars are more attractive to bees than others. Many cultivars have yet to be studied in this regard. Bees rarely visit soybeans in geographical areas with low median temperatures because soybean flowers do not open or produce nectar and aroma in these areas. Studies are needed to ascertain the nature of bee/flower interactions for each agricultural zone. As new knowledge is developed, new avenues can be pursued to maximize soybean yields for growers and honey yields for beekeepers.

Our studies are continuing.□

Acknowledgements

I wish to thak B.J. Erickson for her encouragement and advice and D.C. Robacker and D.W. Severson for their excellent research efforts. I also thank the many members of our staff who assisted in this work.

1/ Mention of a trade name does not constitute a guarantee or warranty of the product by the U.S. Department of Agriculture nor an endorsement over other products not mentioned.

2/ See: Gibson, Glenn. 1979. Soybean Research — A New AHPA Sponsored Project. *American Bee Journal* 19(1): 60-61.

Nectar Collecting

by J. IANNUZZI RFD 4, Ellicott City, MD 21043

Some thoughts on my best— and worst-tasting honeys; on additional contributors; on the costs of collecting; and concluding with (1) a complete listing of all my national and international nectars and with (2) a challenging claim

The Best and the Worst

In my successful search for honeys from all 50 United States and 34 foreign countries, I have fashioned opulent opinions about certain of my stickingly sweet substances. The worst-looking must be my Chinese lychee. Dark amber, it is turning to sugar with a quarter-inch layer of white(!) cystals forming at the base, a completely new experience for me. The most awful tasting by far must be the Trigona from the Philippines, the only one in my horde not from *Apis mellifera* but from *Trigona minima,* the stingless bee that belongs to the *meliponidae* family, not *Apidae* as do the other four races of honeybees. As for the stateside mels falling into this same category, I have no preference but one contributor from Nebraska, Marion Ellis, does have a premier candidate: Wrote he:

> **Smartweed is a fall-blooming plant that secretes a lot of nectar in wet and marsh-like areas. It is probably the worst-tasting honey there is but the bees winter very well on it. You have to remove your honey before it blooms in this area or it will be mixed with the otherwise light mild honey and give it a harsh bite.**

North Carolina's most famous first sweet sourwood does not rank among my favorites (with apologies to my friends, Steve and Sandy Forrest, Moravian Falls), namely, apple blossom, basswood, black locust and fireweed (I also found the Gary H. Schmidt, Martin, South Dakota clover very delightful). My apples come from Pennsylvania, New Jersey and Washington state, the last of which is superior. My two basswoods originated in Howard County, where I live, as well as in Allegany County (Cumberland area), Maryland while the locust is from my very own apiary consisting of about 20 apian domiciles.

The black locust is a peculiar tree. Blooming profusely each year with small white bell blossoms (like a bunch of grapes) around the ides of May just before tulip poplar, it only surrenders a surplus about once every decade. It is a light nectar with an exquisite flavor. Perhaps its infrequency makes it taste better (absence makes the heart grow fonder)?

Then there is fireweed, extra water white, the lightest of them all (honeys do darken over the years). Mine come from Alaska and Canada. The first was a spontaneous August 1982 contribution from DAVE TOZIER, Hives & Honey, S.R. Box 80632, Fairbanks. He had read about me in *Gleanings.* It was 1976 vintage, he remarked, "the best honey year" in the Last Frontier State for a decade. He continued:

> **This is not typical Alaska honey... According to my Color Comparator this would go a notch past Extra Water White, if there were such a grade. The moisture content, by refractometer, is (I didn't write it down but it was) 16.35%. Main nectar source was Fireweed (** *Epibolium angustifolium*) **or Willow Herb with, undoubtedly some wild flowers thrown in (goldenrod, hair vetch, Eskimo sweet pea and a few others that usually are in bloom at the same time).**

(Ah, what a superb taste, that fireweed. During my six-week camping trip to and from that state more than ten years ago, fireweed impressed me, not because of its nectar secretions but because of its healing character: after a conflagration had destroyed an area, the first plant to sprout was this weed which is so very appropriately named!)

My other sample of this nectar, several shades darker, crept in from Port Alberni, Vancouver Island, British Columbia, from the apiaries of GERRY GABEL, taking just under a month to appear on November 23, 1982, prepacked in an attractive "crate." He also had read "I'm a Nectar Collector, Part III," in the October 1982 issue of "the most popular bee journal in the English language."

Other Contributors

The GABEL contribution reminds me of another from his area. The day after the traditional birthday of the most famous cherry-tree chopper in the world, 1984, a package with the return address of 1249 D. McClean Road, Mount Vernon, Washington 98273, mailed on behalf of Jim Stewart, RR1, S2-C17, Naramat, B.C., VOH INO, Canada, joined my nectar ranks. The 16 ounces looked and tasted like clover with a touch of basswood— a very fine combination. Mr. Stewart had telegraphed his apian punches, stating that he kept his 10 hives near an orchard (the honey indeed looked like apple blossom but lacked the distinctive twang) and wondered what kind it might be. He likewise typed: "While reading through *Speedy Bee* for November 1983, I came across the article [I think he meant the letter to the editor] that was in the paper by JIM STEED, Richmond, KY 40475." Although Canada was not mentioned, he was delighted to make a contribution. (I wonder if he was intimating that I should now expand my efforts to include the missing provinces: Alberta, Manitoba, New Brunswick, Newfoundland, *la belle Quebec,* Nova Scotia, Prince Edward Island, Saskachewan and the Northwest Territories—five of which I have already visited on the way to trying to crash *Guinness* as being the first family to have camped at least one night in the 48 contiguous states and Alaska.)

Others made spontaneous contributions:

WILLIAM O. WALKER, 2516 Waverly Drive, Bossier City, LA. 71111 — a pound of each of clover and wildflower (January 1984);

Army nurse ANN T. MCBRIDE, Panama — Panamanian (August 1982);

My sister-in-law DOROTHY MARIE IANNUZZI, Pittsburgh — Knoxville "World's Fair Honey" as well as Swedish and Finnish (August 1982);

JAMES M. STEED, Richmond, Kentucky — Korean lespedeza (December 1982); plus many others too numerous to mention;

MARY E. OTTMAR, Atlantic, Iowa — clover (January 1983);

DR. DAVID SLATER, Ellicott City, Md. — Chinese (March 1983);

JIM ZOERNER, West Olive, Michigan — clover (August 1983); and

ROBERT R. HOFFMAN, Holmen, Wisconsin — clover/basswood (August 1983). (If I have missed anybody, your honey either has not arrived yet or was lost in the mails of All Fool's Day, 1984, when this is being typed. Anyway, as Caesar would say, *gratiae et benedicat deus te.)*

The Cost of Collecting

Amassing nectars is not without its ex-

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penses. Although I do not have precise figures, I feel certain that the jars I have purchased outright and the reimbursements I have made to all contributors (save two: the "mystery" honey man and one other) via directly or by having them fill in my blank checks have depleted my treasury by at least $600 for 244.66 pounds (110.97 kilos) of mel to be found in 250 containers coming from all 50 states and 34 countries (including Puerto Rico) over the past 67 months.

A Challenging Claim

Now that I have completed my goal, I am making the claim that my nectar assembly is greater than anybody else's within the country and, until I hear otherwise, I will maintain that allegation—for what it's worth. During my persuals of pertinent literature over the past several years, I have stumbled upon only two other hordes: (1) the collection of James W. Dickson Jr. (Rt. 2, Horse Shoe, North Carolina) who in 76 autumns has amassed 203 jars from 39 states and 53 nations and who later donated the same to the University of North Carolina in care of JOHN T. AMBROSE and (2) the 490 samples collected by JONATHAN W. WHITE JR. while he was with the U.S. Department of Agriculture, Philadelphia (note that the picture on page 383, revised edition, *The Hive and the Honey Bee,* Roy A. Grout, editor, shows scarcely a filled bottle, whereas of my 196 one-pounders, less than six are not full while the remaining 54 odd sizes are.

Complete Listing: Domestic and International Nectars

For those who want the full litany of my claim, here it is broken down by state and country while those seeking the floral sources alphabetically will have to refer to the first page of the first installment of this five-part series.

a. The 50 states (as of Feb. 14, 1984):

1 Alabama — tupelo
2 Alaska — wildflower [fireweed]
3 Arizona — mesquite
4 Arkansas — wildflower
5 California — alfalfa, avocado, eucalyptus, orange, safflower, sage, tamarisk
6 Colorado — wild geranium
7 Connecticut — wildflower
8 Delaware — blueberry, clover
9 Florida — buckwheat, clover, gallberry, Key lime, melaleuca, orange blossom, palmetto, thistle, tupelo, wildflower, wild raspberry, willow
10 Georgia — tupelo, gallberry, wildflower
11 Hawaii — lehua, mixed blossom
12 Idaho — clover
13 Illinois — clover
14 Indiana — clover
15 Iowa — clover
16 Kansas — sunflower, wildflower
17 Kentucky — blackberry, clover, dandelion, wild cherry, wildflower, tulip poplar
18 Louisiana — wildflower?
19 Maine — wild raspberry
20 Maryland — alfalfa, basswood, black locust, blackberry, buckwheat, clover, holly, lima bean, sumac, thistle, tulip poplar, wildflower
21 Massachusetts — cranberry, linden
22 Michigan — sweet clover
23 Minnesota — clover
24 Mississippi — "sourwood," wildflower
25 Missouri — blue vine
26 Montana — clover, knapweed
26a "Mystery state — "mystery honey"
27 Nebraska — clover, smartweed
28 Nevada — mixed blossom (white sweet clover/ladino/alfalfa)
29 New Hampshire — strawberry, wildflower
30 New Jersey — apple blossom, blueberry, clover, Spanish needles, wildflower
31 New Mexico — mixed blossoms (alfalfa/cotton/tamarisk)
32 New York — buckwheat, dandelion, wildflower
33 North Carolina — basswood, buckwheat, clover, sourwood, wildflower
34 North Dakota — buckwheat
35 Ohio — clover, basswood, black locust, buckwheat, wildflower
36 Oklahoma — clover
37 Oregon — peppermint
38 Pennsylvania — alfalfa, apple blossom, buckwheat, clover, goldenrod, "sourwood," tupelo-tulip, wildflower
39 Rhode Island — mimosa
40 South Carolina — "sourwood," vetch-locust, wildflower
41 South Dakota — yellow sweet clover
42 Tennessee — clover, (genuine) sourwood, Virginia copperleaf, wildflower
43 Texas — Chinese tallow
44 Utah — clover
45 Vermont — clover, wildflower
46 Virginia — clover, mixed blossom (locust/clover/apple blossom) sourwood, tulip poplar, wildflower
47 Washington — apple blossom, huckleberry
48 West Virginia — buckwheat, clover, sumac, wildflower
49 Wisconsin — clover/basswood
50 Wyoming — clover

b. Thirty-four Countries (including Puerto Rico — as of Feb. 14, 1984)

1 Argentina — unspecified
2 Australia — bluebell, leatherwood
3 Brazil — "killer bee," unspecified, wildflower

The best-tasting honeys according to the author (clockwise): J. Iannuzzi's own rare black locust; Fern Wilson's basswood from Oldtown, Maryland; apple blossom, from Snohomish, Washington, gift of George F. Wooten, Malott, WA; and fireweed (mostly), gift from Dave Tozier, Fairbanks, Alaska.

4 Canada — clover, fireweed, goldenrod, mixed blossom?
5 Chile — wildflower
6 China, People's Republic — lychee, watercress, wildflower
7 Colombia — unspecified
8 Denmark — wildflower
9 Egypt — wildflower
10 Finland — unspecified
11 France — lavender, wildflower
12 Germany, West — acacia
13 Greece — wild thyme
14 Haiti — poinsettia
15 Honduras — unspecified
16 Hungary — acacia
17 Ireland — unspecified
18 Israel — orange blossom
19 Italy — wildflower
20 Jamaica — logwood
21 Japan — buckwheat, tree of paradise
22 Korea, South — lespedeza
23 Morocco — unspecified
24 Mexico — wildflower
25 The Netherlands — unspecified
26 Panama — wildflower
27 The Philippines — dorsata, trigona, wildflower
28 Puerto Rico — coffee
29 Rumania — lime blossom
30 Spain — rosemary, wildflower
31 Sweden — unspecified
32 Thailand — unspecified
33 Tobago & Trinidad — mixed citrus blossom
34 United Kingdom — England — wild ling heather
North Wales — heather
Scotland — wild raspberry

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Beeman Dr. J. Iannuzzi with his 50-state collection. Idaho was the last to arrive, February 16, 1984, 67 months after the hobby was inititated. (Read left to right, bottom shelf, starting with Alabama [tupelo] and ending with nine-year old clover from Wyoming, a gift of Coralee Tuck, Sykesville, Md.) [Photo taken by author with self-timer.]

Parting Word

Finally I must express my gratitude again keyed to the 34 nations above and to all those across the country and across the world *(muchas gracias,* thank you, *obrigado,* thank you/*merci beaucoup, muchas gracias, hsieh, muchas gracias, tak, ashkurukum, kiitos, merci beaucoup, danke schoen, efcharisto, mercia beaucoup, muchas gracias, koszonom, tagoromhaith, dank/todah, mille grazie,* thank you, *arigatoo gozaimasu, komapsumnida taedani, shukran, muchas gracias, dank, muchas gracias, muchas gracias/* thank you, and a final thanks heaps to those in the British isles) who have been a part of my meliflous meanderings over these past five-plus years and especially that collector of honeypots from the Blue Grass state, Mr. Santa Claus himself.

SIGNIFICANT NEW PUBLICATIONS

The Impact of Pest Management on Bees and Pollination, price including postage US $24.00

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Testing Your Beekeeping Knowledge

by CLARENCE H. COLLISON Extension Entomologist, The Pennsylvania State University, University Park, PA 16802

Beekeeping practices vary throughout the United States because each geographical region offers different climatic conditions and floral sources. In addition, bees are kept for a wide variety of reasons and operations may have from one to several thousand colonies. With so much variation, it is difficult to write questions for this column, that will have the same meaning for everyone that attempts to answer them.

During the past two months, two specialists in the country have written to me with additional information concerning specific questions where local conditions or crop requirements differ from the answers that were presented. First of all let us consider question 5 from the April 1984 issue dealing with beekeeping pests. The true or false statement was, "The presence of ants in a honey bee colony may be an indication of a weak colony or a colony having problems." The answer was true and I indicated that one of the best ways of controlling ants in hives, is to maintain strong colonies. Steve Taber of Vacaville, California wrote me that, "The Argentine ant, *Iridomyrmex humilis*, will kill healthy honey bee colonies. He indicated that this ant is a problem in California and in the past was a problem in Florida and Louisiana before the fire ant moved in."

Our second letter was from Mr. Malcolm Manners, an instructor in Citrus-Horticulture from Lakeland, Florida. His comments were concerned with the August 1984 test which dealt with honey bee foraging behavior and pollination biology. In question 10, I indicated that grapes are self-fruitful and insects are of limited or no value in pollen transfer. Mr. Manners indicated "while this may be true for some types of grapes, many of the grapes grown in the South (muscadines, hybrids of *Vitis rotundifolia)* produce only female flowers, and have an absolute requirement for cross-pollination from other muscadine varieties." These varieties are therefore, self-unfruitful and do benefit from pollen-transfer. Honey bees actively forage on these varieties and undoubtedly assist in pollen distribution.

In question 13, I suggested that the correct response for citrus could be either B (crop is self-fruitful but still requires insect transfer of pollen) or C (crop is self-fruitful and insects are of limited or no value in pollen transfer). Both answers were allowed since various citrus types differ in their pollination requirements. Mr. Manners further expanded on this question by stating that "most oranges, grapefruit, lemons, and limes do not benefit from cross-pollination. However, a number of specialty citrus, (e.g. tangeloes and some tangerines) produce reduced yields or no yields at all, in the absence of honey bees for cross-pollination." Thus, answer A (require cross-varietal pollination, self-unfruitful) would be partially correct for these speciality citrus crops. A need for different varieties is not indicated.

Reader feedback in regards to these tests is certainly appreciated and encouraged. All of us can benefit from each other's experiences and expertise. A special thanks to Steve and Malcolm.

This monthly feature is a way of testing and increasing your beekeeping knowledge. Take a few minutes and answer the following questions to find out how well you understand general beekeeping.

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

1. _____ The survival of drones during late fall and early winter in the north usually indicates an abnormal colony.
2. _____ Supersedure queen cells are normally produced along the bottom bars of brood combs.
3. _____ Wax glands are located within the thorax.
4. _____ Honey bee workers are covered with branched hairs.
5. _____ A good nectar flow speeds up the recovery from EFB, AFB, Nosema and Sacbrood.
6. _____ Honey bees flying up to 2.5 miles in all directions from a colony, have access to:
   A) 1250 acres B) 12,500 C) 125 acres
   D) 125,00 acres E) 125 acres
7. _____ Terramycin feeding should stop at least _____ before a surplus honey flow in the spring.
   A) 1 week
   B) 2 weeks
   C) 3 weeks
   D) 4 weeks
   E) 5 weeks
8. _____ Beeswax melts at a temperature of:
   A) 170°F
   B) 132°F
   C) 112°F
   D) 120°F
   E) 145°F

Listed below are several structures, organs and glands associated with honey bees. Please indicated in which caste of bees these stuctures are present. (Each question is worth 1 point).

A. Queens, Workers, Drones
B. Queens and Workers
C. Workers
D. Drones
E. Queen

9. _____ Corbiculum or Pollen Basket
10. _____ Sting
11. _____ Spermatheca
12. _____ Nassanoff Gland
13. _____ Hypopharyngeal or Brood-Food Glands
14. _____ Wax Glands
15. _____ Antenna Cleaner

17. What are the three body regions of the honey bee body? (3 points)

ANSWERS ON PAGE 622

Associations Working Together For A Common Cause

By LORETTA SURPRENANT Miner Institute Chazy, NY 12921

With the help of the William H. Miner Agricultural Research Institute, the Champlain Valley Beekeepers' Association was formed in October, 1981. Since that time the Assocation has grown and conducted a good many educational meetings. In May, 1984 again with the help of the William H. Miner Agricultural Research Institute, the newly formed Northeastern New York Maple Producers' Association was established. With the combined effort of the two Associations, a 30' x 50' ample sugar house was erected at the Clinton County Fair Grounds in Plattsburgh, New York.

With very little money in the treasury, the Associations started the construction of the building. The Producers contributed the trees, cut, trucked and sawed the logs for the sugar house. On June 16th, the blocks were layed on a 30' x 50' concrete slab. June 22nd was declared as a work day. It was a bright sunny day and approximately 35 maple producers and beekeepers gathered together to start framing the sugar house. The ladies prepared lunch and worked right along with the men. By the end of the day all the frame was erected. Succeeding work days were scheduled until the building was completely finished. Opening day for the Clinton County Fair was July 31st.

Both the beekeeper and the maple producers shared the same building. What a beautiful building it was! The beekeepers sold honey products, gave free honey samples and had display equipment and materials available for viewing. The observation hive created a lot of interest and tons of questions. Sales were great!

The maple producers had a 3' x 10' oil fired evaporator which they fired up from time to time to give the effect of boiling sap. There were also many exhibits demonstrating both old and new methods of maple sugaring. such exhibits included: a spout display, wooden buckets and pails, galvanized and aluminum buckets, sap bags, snow shoes, a section of a maple tree 103 years old, economizer, pressure filter, reverse osmosis, and a tubing and vacuum system.

Maple products such as maple syrup, maple candy, maple frosted donuts, sugar on snow and maple flavored sno-cones were sold.

Many maple syrup producers and beekeepers contributed their time, effort, know how, materials, equipment, products and even financing to assure a first class operation. They were working together for a common cause. The promotion of NEW YORK STATE HONEY PRODUCTS!

Beekeeping Management Workshop Set For University Of Delaware On Jan. 4, 5, 6, 1985

A BEEKEEPING MANAGEMENT WORKSHOP is set for the first weekend of the new year, starting with Friday evening sessions. The program is coordinated by Dr. Larry Connor, Beekeeping Education Service, Cheshire Connecticut, with local arrangements handled by Dr. Dewey Caron, University of Delaware, Newark, Delaware.

The program will be fashioned after two very successful programs conducted at the Ohio State University in 1976 and 1977. "In those two programs, we split our time in half so we spend equal time on beekeeping management and on business management" Connor explained. "We had many beekeepers attend these programs, including a few hobby operators who are now full time commercial beekeepers".

Workshop content will reflect the changing times in beekeeping with presentations on the bee business area including taxes, insurance, bookeeping, using computers in beekeeping, product labeling, estate planning, considerations in expanding an operation, and related subjects.

Beekeeping management subjects will cover a wide range of subjects, including honey promotion, honey marketing, honey labeling, pollen collection, diseases and mites, bee genetics and breeding, queen rearing, increasing wintering success, increasing colony numbers, preventing bear damage, etc.

The registration fee is set at $95 per person, with reduced fee of $75 per person for second members of the same family or business. Registrations are requested by December 28, 1984, after which a late fee of $25 will be charged.

The University of Delaware is located near Interstate 95 as well as train and plane terminals in Neward, Willington, and Philadelphia. For additional information, registration forms, travel information and motel information, contact Dr. Larry Connor, Beekeeping Education Service, P.O. Box 817, Cheshire, Connecticut 06410. Phone 203-271-0155.

Overwintering A "Nuc" In Arkansas

by THOMAS DOONAN 1416 N. Broadway Heber Springs, Ark. 72543

What would you do, if you had a four-frame strong "nuc", headed by a fine young queen — late in the season, and no place to use it? I'd never attempted to overwinter one before, but decided to give it a whirl once. Little did I realize then, that one of the worst winters ever was ahead for most of the nation, and Arkansas in particular.

First thing, since I had a second four-frame body, with drawn combs, and some honey in them, plus one deep division board feeder, I placed it on top of the bees.

Picture No. 1 shows the two supers wrapped in tar paper, and secured with slats. Then I fastened each end of the telescoping cover with screen door hooks, so it could not be accidentally peeled off.

PICTURE NO. 1.

Picture No. 2 reveals a heavy throw-rug, covering the upper portion of the hive.

The next picture shows how I kept the upper "insulation" as dry as possible, an Egg Pullman carton, with corners and seams reinforced with duct tape, neatly fit down over all. Last, I sprayed the carton with several coats of Amway "dri-fab" water repellent. From there on, all I could do was hope and pray that this small winter cluster would survive. I'm sure everyone who loves bees can understand my feelings.

On December 19th, we left Heber Springs on a Holiday trip, after a substantial snow the night before. We were flying from Little Rock, and we learned later that we beat an ice storm by less than 24 hours. However, it pursued us to Dallas, Texas, where we almost missed a flight to Tacoma, Washington, on account of iced streets: Even in Tacoma, they had ice, and all together the worst winter weather on recored. When we returned to Arkansas on January 30th, the state was mostly a solid sheet of ice, and had we tried to return a day sooner, we wouldn't have been able to make it home.

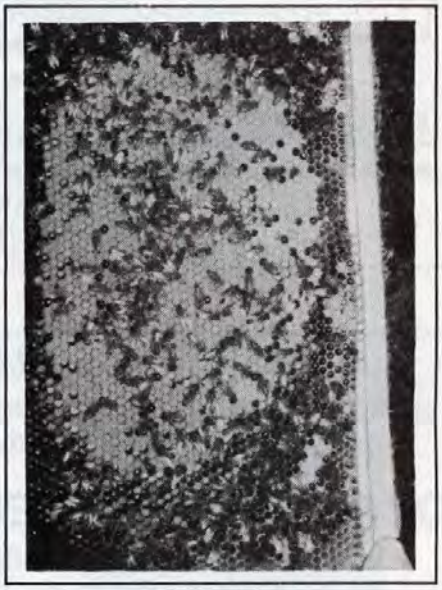
PICTURE NO. 2.

PICTURE NO. 3.

Meantime, back at our city "ranch", that first "go around" of severe weather caused heavy casualties in the "nuc" — too many dead ones in the front of the hive. And I worried! Surely, they could not survive!

However, as the weather moderated, there was a fairly good flight of bees, and I felt some encouragement. Time would tell! Finally, when the bee inspector came on March 27th, we saw, as you may see, the two lovely frames of brood, and in one picture, the large marked queen. Incidentally, that same queen with her bees in an observation hive was shown for two days on behalf of our county beekeepers, at the Cleburne County Fair, in late September of 1983.

That "nuc" was so gentle, I could usually work them with little or no protection . . . Much later on, the "nuc" which (with a little help) survived the winter of '83-'84, was happily used to replace an inferior queen.

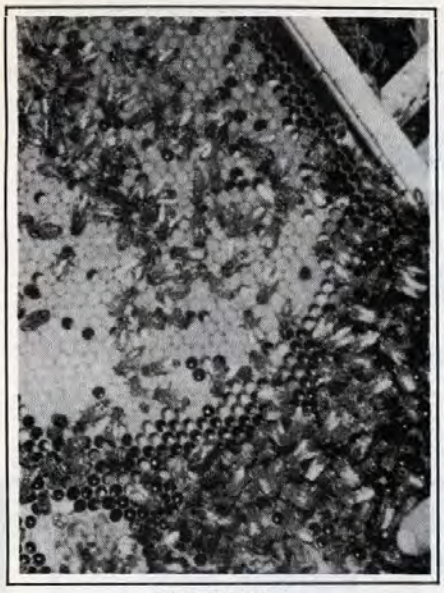


PICTURE NO. 4

The last picture shows all five hives, with their south exposure by our workshop. Protection from cold north winds does make a big difference!

The "alleged spring" of 1984 was miserable, very wet and prolonged cold weather — starvation type weather for bees, which called for endless feeding. Some commercial beekeepers, who couldn't get into the fields were in big trouble. Swarming wasn't much of a problem,

Continued on next page



PICTURE NO. 5

PICTURE NO. 5

the bees were too busy refilling empty 'cupboards", to get the swarming fever when they finally went into summer.

Honeybees are forever full of surprises, for oddly enough, they even made a decent surplus crop of honey before our usual Arkansas hot, dry weather arrived. Brood rearing being so delayed, I never started a "nuc" this season.□

Insecticides vs. Honey Bees
The Wisconsin Supreme Court Decision

by W.L. GOJMERAC[1] and J.J. LORENCE[2]

In July, 1977 and August 1978, some beekeepers in East-Central Wisconsin suffered substantial bee kill when sweet corn was aerially sprayed with an insecticide for control of corn ear worms and corn borers. Beekeepers filed suit in State Circuit Court alleging the applicator and canning company were negligent, claiming $850,000 damages.

The canning company grows sweet corn under contract with local farmers. Canning companies monitor fields and when needed, contract with applicators to apply insecticides. Records indicated the canning company field personnel used standard procedures in monitoring and recommending insecticide treatments. Neither applicator nor canning company personel took steps to warn beekeepers that spraying was to occur in 1977.

Upon observing a bee kill, beekeepers notified the local Agricultural Stabilization and Conservation Service (ASCS) which inspected the hives and reported that bees had been killed by SEVIN.

In early 1978, the local Beekeeper's Association formed a pesticide committee. Its purpose was to encourage communications between beekeepers and pesticide users. Beekeepers identified the location of their hives on maps. The canning company marked fields that might be subject to spraying.

The fieldman from the canning company telephoned the chairperson of the pesticide committee on July 18, 1978 that certain fields were to be sprayed with Lannate. On July 20, 1978, the field man called to indicate when and where the fields were being sprayed. The chairperson of the pesticide committee notified beekeepers that spraying was taking place. The plaintiff (beekeepers) took no steps to prevent bees from foraging in or near affected fields.

At the trial, beekeepers contended the law requires applicators to apply pesticides according to label direction and introduced as evidence product labels containing the "Bee Caution" and associated information. The canning company maintained they were only protecting their property from insect damages and bees were in effect "trespassing." After the case was presented, the circuit judge instructed the jury as follows:

(Summarized and paraphased)

No person has the right to deliberately or wantonly destroy the property of another. Neither does the canning company nor applicator have a duty to protect bees located in the sprayed fields, or protect bees which visit the fields after spraying. The canning company and applicator have a duty to exercise reasonable care when spraying to protect people and property from damage outside the sprayed fields.

If spray is unintentionally applied to other property, or if it drifts onto other properties, the applicant is negligent.

When considering negligence, the jury should consider the manner and method in which the pesticide was applied, whether it drifted to adjacent property and whether the pesticide was applied in accordance with instruction on the label.

In considering negligence — consider the decision to spray fields — the controls they exercised or failed to exercise, the manner and method, including time of day, and weather, and other facts and circumstances surrounding the decision to spray.

The jury found the applicator not liable for damages. This decision was appealed to the State Court of Appeals on the basis that the judge erred in his instructions to the jury.

The court of appeals affirmed the circuit court decision and beekeepers again, appealed to the State of Wiconsin Surpreme Court. The Court's unanimous opinion was written by Justice Callow. The major points are summarized:

Based on common law, a land owner has a right to make use of land as he or she sees fit, but qualified by due regards for interest of others who may be affected by the land owner's activities. The landowner has an obligation to make use of property so no reasonable harm is caused to others in the vicinity.

ANOTHER INTREPRETATION

The trespass analogy is not proper basis to premise a decision that pesticide users are not liable for damage to bees. Bees by nature fly to and from fields. There is no way a land possessor can prevent bees from entering the property and there is no way the owner of the bees can prevent them from foraging except for short time periods. The traditional trespass theory includes notion that the trespasser can be kept off the property. It is the uninvited entry onto property which makes the activity a trespass. Since there is no way for the land owner to eject a trespasser, the term is meaningless in reference to bees.

However, now land owners have a duty to protect bees based on statutes and administrative codes. The Federal Insecticide Fungicide and Rodenticide Act and also Wisconsin regulations (based on federal guidelines) state no person shall use pesticides contrary to label directions. The Court reviewed the legislative intent of their rules and regulations and concluded that it was clear and unambiguous.

It modified common law by enacting **safety** legislation to comprehensively protect people, animals and plant life from improper use of potentially dangerous pesticides. The legislative purpose was carried out, in part, by requiring pesticide users to use and apply pesticides in accordance with label directions. The harm which pesticide statutes sought to prevent was the improper use of pesticides dangerous to people, animals and plant life. The label directions accompanying each pesticide informs the user of what life may be affected by the pesticide and of the optimal way to use and apply the pesticide in a manner which will minimize the risk of harm to affected life. Based upon this legislative purpose, the court concludes that this regulation established a "duty of care" for pesticide users to follow label directions in the use of pesticides. Failure to fulfill that "duty of care" constitutes negligence *per se*.

The label directions on Sevin and Lannate specified certain precautions which should be taken with regard to honeybees, which, the labels specified, could be killed by the toxic effects of the pesticides.

The label on Sevin, the pesticide sprayed in 1977, established two requirements to

Continued on next page

fulfill the "duty of care". First, it was not to be used "when value of bees as pollinators is more important than insect control." The court of appeals determined and the Supreme Court agreed that this applied only to the pesticide user's application on his own property. Because corn is self-pollinating and because the corn was infested with corn borers and earworms, the decision to apply the pesticide was reasonable as a matter of law.

The second requirement was that beekeepers were to be warned to keep their hives beyond bee flight range until one week after application or to take other equally effective precautions. The court said that pesticide users have an affirmative duty to warn all beekeepers with hives within bee flight range of an affected field that spraying will take place. In order to fulfill this duty, we believe that pesticide users must take reasonable steps to ascertain and warn those who might be affected by the spraying. Moreover, the warning should be given far enough in advance of the spraying so as to give the beekeepers sufficient time to take precautionary steps. Once appropriate warnings are given, it becomes the duty of the beekeeper to keep the bees away from the affected field. The pesticide user, having fulfilled the duty to warn, is not liable for the death of any bees that are on the field at the time of spraying or at any time during which the residual toxic effect of that spraying remains. The pesticide user who properly warns is not liable for any secondary bee loss caused by field bees bringing contaminated pollen back to the hive, or any loss to the brood from the lack of care the brood receive from the adult bees due to the death of hive bees.

The court held that this rule properly balances the need for the pesticide user to control insect pests while minimizing the harmful effects to valuable insects such as bees. The allocation of responsibility is equitable because the initial burden is on the pesticide user to warn affected beekeepers, but then the responsibility to take protective measures shifts to the beekeeper, who is in the best position to prevent the bees from coming in contact with the pesticide.

The beekeepers also claimed that the application and use of pesticides is an **ultra hazardous activity** and defendants were strictly liable for any harm caused.

The Supreme Court upheld the Court of Appeal's decision that pesticide application is not **ultra hazardous** and needs to use **ordinary** care in application.

Finally the court ruled that the plaintiff could ask for a new trial on the cause of action based on 1977 spraying because the canning companies did not notify beekeepers before applying insecticide. The fact that the canning company notified the beekeepers of their intent to spray and beekeepers took no action indicate beekeepers were negligent and not entitled to damages for 1978.

Footnotes

1. Professor, University of Wisconsin Madison, Wisconsin.

2. Attorney, Morrow and Pope, Dodgeville, Wisconsin.

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Beekeeping Technology

By DR. JAMES TEW
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Notes Taken on Killing a Deer

It was recently my very good fortune to participate in the combined Illinois-Indiana State Beekeepers' Meeting. The session was a successful blend of a combined state bee meeting, a fall honey festival, and the Paris, Illinois, Homecoming weekend. The enthusiasm and energy of the event was contagious.

The meeting was well attended. Beekeepers came from Indiana, Illinois, Ohio and Kentucky. The speakers slated were impressive. Dr. Erickson (Wisconsin) gave a summation of his soybean research. Ms. Christina Wilson, a representative from John Block's office discussed the honey import situation and their views on the subject. Dr. Orby Taylor gave an enlighting discussion on the Africanized bee problems. An interview with Dr. Taylor will appear in *Gleanings* later in the year. Mrs. JoAnn Weber presented an energetic challenge to the beekeepers to get out and market their honey and not wait for assistance from outside sources. Some guy from Ohio State's Agricultural Technical Institute bee program presented a report on some of A.T.I.'s recent activities in beekeeping (Dr. Tew, of course). Mr. Eaton, extension apiculturist from Kentucky gave an interesting presentation on a 175 year old "bee house" in Kentucky. Mr. Charles Dadant gave an excellent presentation on the future of the industry. All in all it was an excellent session.

Since I had a 6½ hour drive to get back to Wooster, I reluctantly left just before the banquet began Saturday evening. Driving has alway been such a waste of time to me. I can't read my bee material, I can't write or prepare for up-coming events—I just sit there listening to my static infested radio. This trip, however, I tried a new trick which worked nicely. I taped the presentations at the beekeeping meeting and then replayed them on the trip home. It was an excellent review.

At 10:45 p.m., I was just north of Dayton, Ohio, with approximately 3½ hours of driving to go My recorder was going and one of the speakers was giving a discussion on swarming tendencies of bees and what a problem it could be. I recall the car that was 75 yards or so in front of me swerving slightly and touching his brakes. At 55 m.p.h. I was almost immediately in the area where the lead car had just had problems. I was watching for something — I had no idea what.

The next minute of my life became a series of stop frame events. The first event was my sudden awareness that on my left just barely off the road was one of the largest bucks I had recently seen. From my vantage point in my little Ford, I think I was actually looking up at him. The first event proceeded instantly to event two which was "large deer immediately in front of my car". The animal was longer than my car was wide. This event led logically into the third segment of this story which was an incredible crash, the car lurching uncontrollably, and this animal flying over my car along with pieces of whatever. I recall thinking that the poor animal must have disintegrated upon impact. Enough of that. I now found myself in a swerve that was going to flip my car, a car that no longer had any headlights at all. I fought the car all over the road, finally regained control, and rolled off to the emergency lane.

For an instant, I reviewed things. The car was a wreck, wisps of steam gently fogged my windshield while other things hissed at me. Everything inside the car was in total disarray. This shocked quietness was broken only by the unceasing lecture of the beekeeping authority telling me that swarming could be controlled if one were persistent. My first wild thought was, "Hey, stupid, we were almost killed, and you're still talking about bees — take a break."

The car that had swerved and braked for this animal was now backing crazily down the emergency lane to help me out. They were the "Clines" from Virginia, and they were of great assistance. In short order they had the police on the scene. The deer had not disintegrated at all—that had been the car flying all to pieces. Incredibly (and unfortunately) the animal was still alive. The police officer stopped the animal's suffering, turned to me, and announced the deer was mine—What did I plan to do with it. People, I have no real use for a dead 275 pound — 9 point buck at midnight, with my car totaled out while I am 3½ hours from home. I recall sputtering I didn't want the animal under any conditions. About that time the battery in my car (or what was left of it) exploded (no fire), the officer called for a fire truck, a wrecker, and someone to come for the animal. Interestingly enough, the people that came for the deer beat the fire truck and the wrecker to the scene. by 1:00 a.m., I was safely in a local motel and began to place phone calls to my wife. I had to also call the Ohio State University and tell them we had one less car.

I wonder if the Illinois-Indiana State Beekeepers would consider a $3000 expense report for attending their excellent meeting? Probably not!

Siftings

By CHARLES MRAZ
Box 127
Middlebury, VT 05753

This past year I have had the opportunity to attend a quite a few meetings of beekeepers in different parts of the country on one of my favorite subjects, Bee Venom Therapy. What is most surprising is to see the growing interest by many beekeepers in Bee Venom Therapy, not only to talk about it, but to actually work with it, to treat their family and friends that suffer with rheumatic diseases.

Just a while ago a beekeeper called me on the phone and said that I claimed 80% of the people treated get good results. It is indeed possible because it is rare indeed that an arthritic does not get some help from BV Therapy. We use 80% only to keep within a reasonable figure. Actually, I would say about 95% of those treated and go through the treatment will get results. There are a few that will not respond which disturbs us very much. We cannot figure out why.

This is indeed a good sign. The medical profession at this time is not permitted to treat rheumatic diseases in this way. If anyone wants to try BV Therapy, they must do it on their own with the help of a beekeeper if they have no bees. With this increase in interest, it is time, I believe that those of us interested in this work should get together once a year to a meeting to learn from each other. Even after 50 years of experience, we still have so much to learn; what BV Therapy can do and how to do it. It is a complicated problem, since we are all different and we all respond differently to any treatment. BV Therapy is helpful even in other problems besides arthritic diseases. The only way we can learn is by experience, not only our own, but also the experiences of others. That is where a meeting would be so helpful, to share our experiences and to learn that much better and faster.

We already have such an Association; The North American Apiotherapy Society, and our next meeting will be November 10th at the Baltimore-Washington Airport. Anyone interested in further information, write to: Ann Harman, North America Apiotherapy Society, 15621 Aithcheson Lane, Laurel, Maryland 20707.

It looks like the beekeeping industry has finally awakened to the problem, now that the Acarine mite has finally crossed the border from Mexico. And now there is talk of eradicating it in the U.S.. In Europe this as been tried many times, and so far it has not worked. The Acarine mite will always be with us and it won't be long before it will be everywhere in the U.S. and we will have to learn to live with it. They have done so in Europe and South America for many years. The best course to follow so far is to select bees for resistance to this problem. There is no question this resistance does exist, the question is how and why. Then we will be better able to promote this type of control.

I have heard that there is a type of fungus that will attack the Acarine mite within the bee and kill it. This would be an ideal solution if this fungus could be propagated and introduced to the bees. This would be a "perpetual, natural biological control". We know that every form of life on this earth is controlled from taking over the whole earth by many forms of biological controls. Acarine and Varroa mites are not exceptions. They are plagued by diseases and parasites like the rest of us. We must learn to take advantage of this fact.

Personally, even more devasting to the honey business, is the bad publicity bees and honey has been getting the past several years, especially the "botulism scare". Until honey regains its former respect as one of the best natural health foods, the market will never improve, but may even deteriorate further, if attacks on the goodness of honey continue. It is time for the beekeepers to counter attack, and prove that thousands of years of the history of bees and honey is still the "gospel" truth.□

Research Review

By DR. ROGER A. MORSE
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Identification of Africanized Honeybees

Honeybees from Africa were introduced into Brazil in 1956. They and their hybrids have spread in all directions from the site of their introduction. The southern limit of their spread is not precisely known though it appears they are limited to Northern Argentina. If they are further south their behavior would appear modified.

The present northern limit of their distribution is Nicaraugua, not too far south of Mexico. It is said by some that they will arrive on the Mexican-U.S. border about 1990 and that the results in parts of the Southern U.S. will be catastrophic. Others believe Africanized bees from Brazil were introduced into Mexico a decade or so ago. However, this report has been criticized because the method of indentification is not certain. Earlier introduction of honey bees and honey bee sperm from both Africa and Brazil into the U.S. have been documented.

However, despite all that has been done in the identification of African and European bees and their hybrids is not a precise science. No one has devised a perfect method of identification and we are forced to state that we believe, within some percentage of confidence, that this is or that bee is or is not African or something else. It is like the weatherman's situation, who can only say there is some percentage of a chance it will or will not rain.

Several years ago it was thought that measuring certain characters, such as the length of a body part or of a wing cell or vein, would be satisfactory means of distinguishing African bees from European bees. This system is called morphometrics. It sounded like a reasonable method since bees from Africa are about ten percent smaller than their European counterparts. Today morphometrics are used as a means of identification, but only because there is no better method available.

Attempts have been made to measure differences in aggressiveness between Africanized and European bees. There is no question on the part of those who have worked with bees in South America and Africa that the African races and their descendants are more aggressive. However, there is great variation in this regard and some slight overlap in aggressive behavior. Almost every beekeeper can recall an incident where European bees were unusually aggressive. The deaths of domesticated animals and man have likewise been recorded from North America as a result of a severe stinging.

Two papers have appeared within the past few months that are of special interest to those who have followed the African bee story and the problem of its identification. One (Carlson and Bolten) states that one may extract waxy substances (hydrocarbons) from the body surfaces of Africanized and European bees and that there are "significant differences" between them that show promise for identifying the origin of the bees. The second paper (McDaniel et al.) is not so encouraging, saying that "a large number of variables remain to be examined before hydrocarbons can be used routinely to identify ecotypes of *A. mellifera*."

The problem of identification becomes more acute as we near the time when the invasion of Africanized bees is predicted to occur. Many beekeepers I have talked to fear that the bad press given the Africanized bee will have a negative effect on their beekeeping. This is especially true in urbanized areas where finding apiary locations is already difficult. We are aware that most of the public cannot tell the difernce between a yellow jacket and a honey bee. As a result beekeepers in many areas are often blamed for problems that are not theirs. Some beekeepers have been forced to give up good apiary sites because of such misunderstandings.

An interesting aside in this affair is the recent finding of a swarm of Africanized bees on a ship that landed in an Ohio port after traveling up the St. Lawrence River and stopping en route. The swarm was identified as coming from South America because the bees were infested with varroa mites that have not yet been found in North America. The finding of live mites on the bees is not consoling but it did serve to make the identification positive.

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*Honeybees are native to Europe and Africa and there are many races. with great differences between them in color,behavior and size to be found on both continents. We use the words African and European to identify the two groups. The word Africanized is used to identify the bees in Brazil that are said to by some to be crosses between the original European bees that have been kept there for several hundred years and the African bees introduced in 1956. A question that has not been answered in everyone's mind is what percentage of the Africanized bees are purely African. A shortcoming in the research that has been done to date on the question is that there has been little study of the African bees in Africa, at least by scientists from North America.

MAILBOX

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cept in a building or enclosure which is so constructed as to prevent access by bees. Section 29217: It is unlawful for any person to keep any comb which is not occupied by a live bee colony unless such comb is tightly enclosed so as to prevent access to the comb by bees. Section 29218: Any hive or appliance which contains any comb that is not occupied by a live bee colony and that is accessible to bees constitutes a public nuisance. Section 29219: It is unlawful for any person to make honey available to bees by means of open-air feeding. Article II, Section 29701: Any violation of any provision of this chapter is a misdemeanor and punishable by a fine of not less than ten dollars nor more than five hundred dollars, or by imprisonment in the county jail for not more than six months, or by both.

To conclude, please do not advocate or condone Richard Taylor's method of cleaning supers, for under certain conditions, the consequences may be devastating and jeopardize our honeybees. **Richard Low, 1032 Highland, Vallejo, CA 94590.**

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STATEMENT OF OWNERSHIP MANAGEMENT AND CIRCULATION (Act of August 12, 1970, Section 3685, Title 39, United States Code). 1. Title of publication: GLEANINGS IN BEE CULTURE. 2. Date of Filing: October 1, 1984. 3. Frequency of Issue: Monthly: A. Issues # 12, B. Price $10.35. 4. and 5. Location of known office of publication, headquarters or general business offices of the publisher: 623 West Liberty St., Medina, Ohio 44256. 6. Names and addresses of publisher, editor and managing editor are: Publisher, The A. I. Root Company, 623 West Liberty Street, Medina, Ohio 44256; Mark Bruner, Medina, Ohio; Managing Editor, John Root, Medina, Ohio. 7. Owner, The A.I. Root Co., Medina, Ohio; Stockholders Alan Root, Medina, Ohio; John Root, Medina, Ohio; Stuart Root, Medina, Ohio; David Root, Sebring, Florida; Elizabeth Judkins, Silver Bay, Minnesota; Katherine Warner, Kent, Ohio; A. T. Spitzer, Medina, Ohio; Blake & Co., Medina, Ohio; Ethel Calvert, National City, California; Donald Demuth, London, England; Mildred Goldthwaite, Urbana, Ill., Warren & Robert Heyer, San Diego, Calif.; Ruth Packard, Tustin, Calif.; Barbara Tweedle, Limerick, Maine; Clark Cooper, Medina, Ohio; Mary Williams, Medina, Ohio 8. The known bondholders, mortgagees, and the security holders owning or holding one percent or more of total amounts of bonds, mortgages or other securities are: None. 9. For completion by nonprofit organization authorized to mail at special rates (Sec. 132-122, Postal Manual); Not applicable. 10A. Total number copies printed (net press run); Average number copies each issue during preceding 12 months, 22,593. Actual number of copies of single issue published nearest to filing date, 26,033. 10B. Paid circulation. 1. Sales through dealers and carriers, street venders and counter sales; Average number copies each issue during preceding 12 months: 280. Actual number of copies of single issue published nearest to filing date: 194. 2. Mail subscriptions: Average number copies each issue during preceding 12 months: 20,260. Actual number of copies of single issue published nearest to filing date: 23,919. 10C. Total paid circulation: Average number copies each issue during preceding 12 months: 20,540. Actual number of copies of single issue published nearest to filing date: 24,113. 10D. Free distribution (including samples) by mail carrier or other means: Average number copies each issue during preceding 12 months: 90. Actual number of copies of single issue published nearest to filing date: 90. 10E. Total distribution (sum of C and D): Average number copies each issue during preceding 12 months: 20,630. Actual number of copies of single issue published nearest to filing date: 24,203. 10F. Office use leftover, unaccounted, spoiled after printing: Average number copies each issue during preceding 12 months: 1,963. Actual number of copies of single issue published nearest to filing date: 1,830. 10G. Total (sum of E and F should equal net press run shown in A): Average number copies each issue during preceding 12 months: 22,593. Actual number of copies of single issue published nearest to filing date: 26,033. **Total paid circulation as of October 1, 1984 GLEANINGS IN BEE CULTURE: 24,113.** I certify that the statements made by me above are correct and complete. (Signed) Mark Bruner Editor.

A Comparative Study of Honey Bee Races

by KATHY & ROGER HULTGREN 155 Lovell Rd. Holden, Mass. 01520

Within *Apis mellifera* there are two races of honeybees based on color and behavior, the black, brown or dark bee and the yellow bee. Other researchers classify the races based on their environmental adjustments to their native homelands. Such classification yields three races: European, Oriental and African. For discussion purposes the dichotomy of black, brown or dark bees and yellow bees will be used.

Black, Brown or Dark Bees

This catagory consists of the German, Carniolan and Caucasian bee. The German bee first came to New England from Holland or England in 1638. They are characterized by black/brown bands with yellowish hair on the segments of their abdomens. The queens are less prolific and the bees have a tendency to build more queen cells than the Italians. If left queenless, workers soon develop and begin laying. German bees are not the best housekeepers and thus wax moths easily invade the hives and they are more susceptible to European Foulbrood than other races. Their positive attributes include white cappings, winter hardiness and the ability of smoke to subdue their cross temperment. In the past, they have been used in the production of comb honey.

Benton in the 1880's made the first queen shipment of Carniolans to America. These bees originate in the Alps of Austria and are the second most popular bee in America. The segments of these bee's abdomens are black bands with a greyish ring. Their hair is short and dense and gives the color impression of silver gray. They are noted for their gentleness, their excellence in breeding, their ability to withstand cold winters, their resistance to European Foulbrood and their reduced tendency to rob. Their brood rearing is directly related to the pollen supply. The resultant being plenty of brood is indicative of a bountiful pollen supply and the opposite is also true. Since the Carniolans utilize little propolis, have clean white combs and cappings and are good gatherers, they are often employed in comb honey production. They do have a drawback in that they build numerous queen cells and will swarm in as well as out of season.

A close resemblance to the Carniolans are the Caucasians. Next to the Saharan bees, which make their home in the Sahara desert, the Caucasians are considered the gentlest bee in the world. They are mountain bred and can vary in color from abdominal bands of yellow to black or grey depending upon the origin. The worker's hair is lead grey while the drone's thorax hair is black. Caucasians were first imported to America by a New York man named Hoffman in 1880. The American Caucasians originally came from the Northern part of Caucasus where the bees have a black or grey coloring. These bees have a particular characteristic which is their trademark. In the fall, the Caucasians build a wall of comb at the entrance with an exit just wide enough for a single bee. Their other qualities are their wintering ability, a reduced swarming tendency, resistance to European Foulbrood, adequate hive defense and minimum drifting. They are also known for their white cappings. The disadvantages of the Caucasians are their susceptibility to nosema and the inclination to utilize burr comb frequently. Mention should be made in the difficulty of locating the queens and the fact that peak colony strength occurs in mid-summer.

Yellow Bees

Italian, Cyprian, Palestinian, Syrian, Egyptian, African, Japanese and Indian bees are the major subgroupings contained within the race of yellow bees. The most popular bee in America is the Italian. It is thought that the Italian species came into existence when the Roman civilization moved northward. The hypothesis is that the Greek Cyprian bees, which are yellow, crossed with a dark variety and resulted in the formation of the Italian bee. This would account for the variety in color from dark to light within the Italian strand. The bees direct from Italy have two yellow bands with a third sometimes showing next to the thorax. The leather or light colored Italian bee is found in Southern Italy while the darker variety is found in the Northern section. Italian queens vary in their amount of yellow coloring, some have their entire abdomen area yellow, some alternate with yellow and black bands and others have the upper portion of their abdomens yellow while the lower tip is black. The drones may be striped but are usually darker with some having one or two bands of yellow. Dzierzon in 1855 was the first to bring Italian queens to America. At that time, they ranged in price from ten to twenty dollars. The first direct shipment occured in 1860. With Italians, brood development starts early in the spring and a large force is maintained until fall regardless of the type of honey flow occurring. The Italians are excellent workers and housekeepers which results in their ability to control wax moth and to resist European Foulbrood. Other attributes consist of their gentleness, their reduced swarming tendency and their ability to withstand extreme temperatures. On the negative side, they have a high rate of honey consumption and are inclined to drift.

As would be expected, the Cyprian bees are similar in appearance to the Italians but smaller in size. Their origin is the Island of Cypress in the Mediterranean. The Greeks were experienced beekeepers as early as 750 B.C. and utilized Cyprian bees in the first record of migratory beekeeping. Possessing a lighter yellow color than the Italians the Cyprian's markings are typically uniform. Their abdomens consist of three posterior yellow bands which are broader than the Italians and a very black tip which gives a painted wasp like appearance. The underside of their abdomens have a glossy sheen which glistens in the sunlight. A golden shield is located between their wings on the thorax area and two half moons are formed by the termination of the upper blackish portion of their bodies. The Cyprians tend to yield a large honey crop even if it is necessary to fly further distances. Their queens are very prolific, the workers are known for minimal drone cell building and are extremely winter hardy. These bees were first imported successfully in 1879 by Stahala but were soon abandoned due to their extremely cross temperment.

A bee smaller in size than the Cyprian but possessing the trademarks of the golden shields between their wings and the black half moons on their sides are the Palestinians. Their queens are quite yellow, long, slender and very prolific. The workers are identifiable by the alternating colors of citron and black on the first three segments. These rings are covered with a greyish fuzz. Palestinian young bees mature rapidly and are full size in just a few days. Noted for their cell building, they are often utilized in queen rearing. They produce numerous queen cells and the

Continued on next page

Comparison of the Three Most Common Honeybee Species In The U.S.

SPECIES	ORIGIN	COLORING	POSITIVE ATTRIBUTES	NEGATIVE ATTRIBUTES
Carniolan	Alps	Black bands w/grey rings appear silver grey	Gentle Excellent breeders Winter well Resist EFB Reduced robbing White combs White Cappings Good gatherers Used in comb production	Numerous queen cells Swarm in & out of season
Caucasian	Northern part of Caucasus	Black or grey bands trademark: reduce entrance in fall with wax	Very gentle Winter well Reduced swarming Resist EFB Minimum drifting	Susceptible to Nosema Build burr comb frequently Peak colony strength in mid-summer
Italian	Southern Italy	Yellow & Black Bands alternating	Gentle Brood develops early in spring and remains strong until fall Excellent workers Resist EFB Control wax moth Withstand extreme temperatures Reduced swarming	Inclined to drift High rate of honey consumption

emerging queens are quite large and strong. The Palestinian bees will make an enormous effort to gather nectar in times of dearth and winter better than the Italians. However, when left queenless, even for a short time, laying workers soon develop.

Within the Syrian group their are two varieties, the Sayyafi which means "warrior," indicative of their viciousness and the Ghannami which means "sheeplike," designating their managability. Syrian bees are identified by fuzz over their thorax, yellowish wing edges and the first three abdominal segments containing pale lines. Their queens are prolific and their workers are industrious. However, there are numerous negative factors with this grouping, abundant propolizing, excessive swarming, and poor wintering ability. Virgin queens are known to coexist until one is mated and often leave with after-swarms. Jones and Benton in 1880 brought the Syrian bee to America but shortly thereafter they were abandoned due to their shortcomings.

Egyptian bees build smaller cells in their combs than other varieties. Their abdominal segments range from light yelow to reddish bronze with black borders. The hair covering their bodies also varies from white to grey. Egyptian queens possess this reddish bronze tinge, are small in size but prolific. Originally, these bees were kept in kawarats or mud tubes from which they tended to swarm excessively. When housed in modern hive bodies this inclination is curbed. These bees are often employed in the production of extracted honey but are unproductive in sections. Emerging swarms, which rarely exceed a pound, and a distain for winter clustering restrict the Egyptians adoption in certain areas. During a honey flow and in warm weather these bees are very manageable; however, when weather is unfavorable, supplies low and/or a queenless situation arises even the application of smoke will irritate them. Mention should also be made of their predisposition to laying workers and their rearing of numerous drones. They were first introduced to England and America in 1867 but have since been abandoned.

The African bees extend in Africa from the Sahara to Kalahari but have yet to extend into areas where the temperature is below 20 degrees C. These bees have been advancing at a rate of 100 to 200 miles a year. A contributing factor to this rapid advancement is their swarming inclination which can be as high as seven to eight times a year. In times of dearth, they have absconded up to twenty miles. The African bee is 1956 was involved in a Brazilian breeding study when an accidental release of *adansonii apis mellifera* occurred. This species cross bred with the local Brazilian bee, however, the genetic traits of aggressiveness and viciousness were dominant characteristics. At this time, they continue to advance throughout South America. The African bee is known to store more honey than any other variety and their queens have been known to lay 5,000 eggs daily.

The Japanese bee is closely related to the Indian bee, *apis indica,* which will be addressed later. The first two to four abdominal segments of the Japanese bee are brownish yellow in color. The queen and the drones are black with the drones exhibiting twisted hind legs. It is interesting to note that this species builds comb $^{7}/_{8}$ inch thick with 31 cells per square inch whereas the Italian bee has 25 cells per square inch. This particular breed is extremely industrious working even in meager flows and will work in weather as chilly as 40° to 44° F. They use honey sparingly, secreate wax copiously and produce white cappings. Their colonies are very small with a populous of 5.000 to 7,000 bees with a maximum of 58,000. Left to their own means their honey yield would be 15 to 18 pounds however, when modern methods are employed the yield is increased to 50-60 pounds. Their negative attributes are their repetitive swarming, their inclination to chew holes in the

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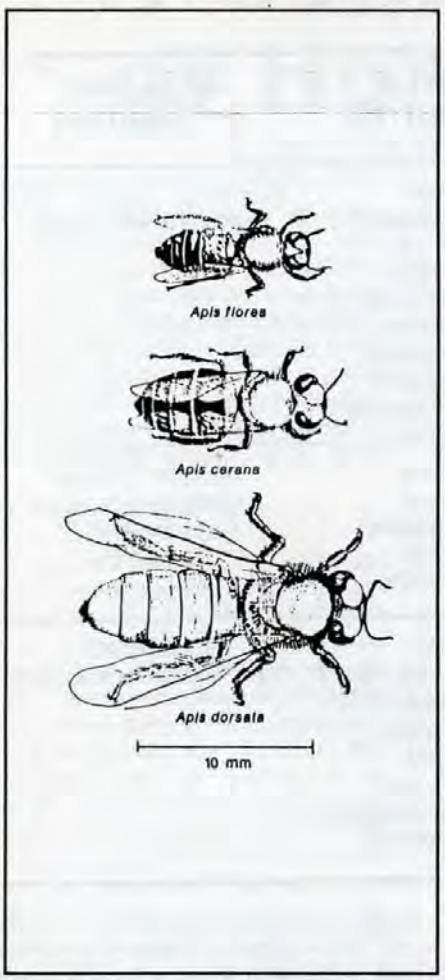
foundation, their inability to repel wax moths, their tendency to rob and their inability to be calmed with the use of smoke.



Pictured above are the workers of each bee speices found in India. The comparative size difference is quite evident in this illustration with the head width being 30% greater between *apis florea* **and** *apis cerana* **and 40% greater between** *apis cerana* **and** *apis dorsata.*

India has three species of bees: *apis cerana,* which are located in the hilly tracts, *apis florea,* which inhabit the plains where the temperature reaches 120°F and *apis dorsata,* which abides in the sub mountain tracts and lower hills. *Apis cerana* builds their worker cells in accordance with the altitude, for example, in the valleys their cells will have 5¼ per inch while in the plains the cells will number six to an inch. Their abodes are found in tree trunks and hollowed out logs. *Apis cerana* is highly resistant to nosema, easily subdued by smoke and gentle in nature. Their tendency to swarm occurs seven times annually and is a contributory factor in their meager yield of 8 to 10 pounds of honey. Robbing is a serious problem within this species. When queenless, laying workers soon develop. It should be noted that this particular species is infested with varroa jacobsonian and is also unable to repel against wax moths.

Apis florea constructs their single comb which is the size of a palm of a hand in bushes or in high well lighted places. These bees are so gentle they have been nicknamed the stingless bee. Their yield of honey is usually one pound, very thin but is acclaimed for its high medicinal virtues. These bees are prone to swarm at least twice yearly.

Apis dorsata, the bee of Ceylon, resides in a single huge comb which is built on the face of rocks or on branches of mango or banyan trees. a single tree has been known to harbor fifty or more colonies. These single combs measure five to six feet wide and about two feet long. The top portion of the comb is four inches thick and is where the honey is stored while the brood portion of the comb is only 1¼ inches thick. Workers and drones are comparable in size to Italian queens. Three-thousand of these bees are needed to make a pound. Being very industrious, a single colony can contain 80 pounds of honey. *Apis dorsata,* often nicknamed the giant or rock bee, is very ferocious and vicious. There stings are painful and have been known to be fatal. When enraged, these bees will pursue their victims for long distances. To date, they have not been hived and so they exist in their natural melieu often migrating acccording to seasonal changes, lack of honey or wax moth invasions.

Beekeepers have always searched for the super bee, one which would gather the most, have the most prolific queens, be the gentlest and most resistant to all diseases. This quest has been like a rainbow's pot of gold which is never meant to be found. Perhaps man's attention should be turned to the opportunity and challenge of adjusting his management techniques in order to maximize the positive and minimize the negative attributes of each species. This change of focus would indeed create a super or masterful beekeeper.□

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The McClymonts of Panama

by DEWEY M. CARON University of Delaware

I first heard of the McClymonts through an article in the January 1969 *Gleanings In Bee Culture*. I was preparing for a trip to Panama to examine the beekeeping and entomology of that country. I visited Sam and Greta McClymont on that trip and subsequently have revisited twice more. The McClymonts were pioneers in beekeeping in Panama. They had to learn how to obtain and sell honey. Now, with the arrival of the African bee[1], an entire new beekeeping must be learned.

Sam McClymont told the story of how he and Greta had started with bees in his 1969 GBC article. Sam was a charter boat captain in South Florida. He was looking for a retirement activity and a carpenter who repaired boats chanced to say on one of those rare cold winter days of Florida that if he could retire he would raise bees in Central America. Sam longed to return to a gentler climate that day and the carpenter's description of a vertible beekeeper's paradise with flowering plants year round was just the opportunity he was looking for.

Sam and Greta soon began to prepare for retirement. They first learned beekeeping basics from Raymond Myers of the Dade County Beekeepers Association. Sam sailed for Panama to find a home toward becoming "Honey millionaires" in the words of Henry the carpenter. Greta did a lot of the learning by attending Miami area beekeeper meetings and working the hive they bought from Myers. Sam was still at sea a lot but Greta took careful notes and would teach Sam between his trips.

When Sam retired in 1965, he and Greta moved to Panama. They bought their first hives from a Jamacian Thonson the next month. They were now ready for their first dry (honey producing) season in Panama. Both Sam and Greta said during many visits that they wish they could have gotten their hands on Henry the carpenter more than once that year and many after. There was honey to be gathered and sold but it was never quite as easy as they thought it would be. Like beekeepers everywhere, the road to honey riches had many detours and potholes for the McClymonts.

Sam wrote some of their difficulties in the 1969 article that way my single introduction to beekeeping in Panama. Little was known about beekeeping in Panama so the McClymonts had to learn from scratch. They had shared a little of their information with GBC readers to at least my subsequent benefit.

Although plants flower year round in the tropics, honey bees have a season there just as they do in the U.S. The dry season of late November to late April is the prime honey storage season and beekeepers usually remove honey three times for extraction. There is no heavy flow as such with the honey being a mixture of floral sources of amber color. I found however that three harvests, which sounded pretty good, was quite misleading. Because of wax moth and ants it is impossible to store drawn combs in Panama. Beekeepers add a super of as few as 2-3 combs and must remove, extract and replace these frames during the honey season. During the wet season, beekeeper generally must feed a lot of sugar syrup. Robbing bees are a continual problem.

Sam McClymont in 1982 with his gentle European colonies. The backyard apiary site is useless now with the African bees that invaded Panama.

One of the things Sam McClymont found was the necessity to sell the product. Honey was expensive ($7.00 a gallon vs. $4.00/gallon in the U.S.) and used primarily as a medicine. Sam was a master salesman. His market owners would say "Here comes the sweetest man in Panama". Sam sold service along with a quality product. Greta actually came up with their product name. After endless waiting and frustration getting supplies both into Panama and shipped from the states and endless excuses of "manana" Greta vowed that when (if?) they ever got it all together they would have to name their business **Miel Manana.** They did of course and **Miel Manana** stands for quality in Panama.

Sam the super salesman died this past year. Greta continues **Miel Manana** by purchasing honey from other beekeepers. The beekeeping operation grew to 350-400 hives — a commercial enterprise in Panama — but demand exceeded their own production almost from the start. As Sam got older, he concentrated on teaching others beekeeping and used many colonies to get newcomers started in bees. There still is a home apiary and one honey producing yard but the African bee has changed their operation completely. The photograph of Sam was taken in 1982 and shows Sam with one of his colonies in the home apiary. It was one of about 20 in their backyard in the center of a small community outside Panama City (Nvo. Arraigan). Obviously the bees were very gentle

Since the arrival of the African bee, urban locations are quickly becoming a thing of the past. Accidents are too likely with this aggressive and unpredictable bee. At the McClymont's only a couple of colonies remain at home. A colony was alarmed one time when the patio of the home was being cleaned with Pine-Sol. Once alarmed the bees stayed aggitated for the remainder of the day creating quite a problem.

The single remaining honey producing site is now in a rural area. Greta worries about the cattle in the vicinity of the apiary getting injured from her bees. Swarms are no longer captured and stacks of equipment are avoided because they readily become homes for swarms of the African bee. A stack of several supers in the yard was wrapped in plastic yet an African bee swarm found a tiny tear to gain entry. African bee swarms just as likely leave after setting up a nest. Although gentle as a swarm, the colonies become unpredictable and aggressive as they grow larger.

Honey is still available from parts of western Panama that are slightly higher in elevation but Greta worries about finding enough honey for her markets. Honey production is down considerably this year while consumption remains steady. An additional worry is her source of honey containers. Glassware is not available except

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The McClymonts Miel Manana label. The lettering is dark blue, the border is light blue dots and the sun and flower nectar are bright yellow with the bee's body a pale yellow color.

from the U.S. at a high tariff. A local plastics company keeps changing their container and now have discontinued the 12 ounce round bottle. Many producers use liquor bottles which are sufficient for rural trade but less so for the modern markets of **Miel Manana.**

Given the resourcefulness of Sam and Greta in gettng their honey to market initially, I believe that Greta will find a good solution to the current problems. Given the availability of enough honey with the African bee, the McClymonts will continue their business in Panama.□

The Honeybee and Napoleon Boneparte (1769-1821)

By BERNIE HAYES, 121 Miller St., Wellsville, N.Y.14895

Napoleon Boneparte, while he was commonly remembered for his military genius, had wide-ranging interests even into that of the scientific community of his day.

One of his most quoted statements was that "An army fights on its stomach" and he also gave encouragement to finding a substitute for butter as well as the preservation of food by canning it.

Being in command of thousands of troops and responsible for their welfare the problem of an adequate sweetener must have, at one time, absorbed his attention for table sugar had not yet made its appearance though the West Indies were furnishing some molasses at the time.

Presumably, in the lull of conquests (1800) while he may have been absorbed in creating his Code Napoleon, reforming the educational system, or giving his attention to the first Bank of France, he may have had the honeybee design added to the tapestry on the arm and seat of his chair.

Of course, Napoleon being a genius of real energy and widespread interests, possibly had selected the bee not as much for its honeys but that it examplified the life of labor hurrying from blossom to blossom and later a "beeline" to the hive and the creation of a unique food.

At this period in history, the rulers of the world were encouraging their subjects to become interested in such foods as the tomato, and many others due to exploration going on world-wide.

I note in my book entitled *"The Good Women of Manhattan"* (1898) that the Dutch settlers often had beehives at the rear of their houses in the the New World. It is significant that the Dutch East India Company considered the hives essential as a sweet food supply.

The common bee of France, of Napoleon's time, was the Brown bee which ranged from Russia to Portugal, including Spain and Switzerland. These native bees were hardy and resistant to European foul brood which at times would have weakened the colonies in northern Europe. This bee was more gentle than the black bee of other countries and much liked by the beekeepers.

Of course, to those he defeated, Napoleon was hated as Europe's most war-like ruler but his choice of the honeybee to adorn his royal chair suggests a more gentle nature.□

Pricing Policies and Strategy

By RICHARD J. NIKLAS, M.B.A. Assistant Professor of Food Marketing
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Many individuals start into beekeeping as a hobby and before long find out that they have more honey than they can personally consume. Faced with a surplus, many new beekeepers decide to make their first move into the small business world. Generally, they start to market their honey to friends, neighbors, or possibly coworkers at their regular place of employment. A few of the more aggressive individuals may even search out potential retail sites such as roadside markets or local independent supermarkets. One of the biggest decisions facing the new enrepreneur is that or pricing merchandise.

Pricing policies are rules of action or guidelines that ensure uniformity in pricing decisions. Establishing pricing policies is no easy task for the new entrepreneur. While large business firms have numerous managers who are involved in making pricing decisions, small business owners are often left to their own devices when reaching decisions concerning price.

The pricing policies of a business should be in agreement with the broader goals of the business. Some pricing policies are financially oriented, while others are not. By focusing on pricing objectives, the new business owner can establish pricing policies that will assist in creating the desired image for the business that will appeal to the most consumers.

Some typical pricing objectives are:

1. **Maximizing return on investment**
2. **Attaining satisfactory productivity**
3. **Increasing a market share**
4. **Projecting a desired product image**
5. **Meeting competition**

It is not unusual for a business firm to have several pricing objectives; however, to reach broader organizational goals, the new business owner should select pricing objectives which are compatable. An example of pricing objectives which may not be compatable are maximizing return on investment and meeting competition; however, projecting a desired product image may be fully compatable with maximizing return on investment.

When establishing an overall pricing policy, new entrepreneurs must decide whether they should sell at market levels, above market levels, or below market levels. Here again, a balance must be achieved. Pricing below market levels may not be compatable with the broader organizational goal of maximizing return on investment; however, it can be a very desireable policy for increasing market share or achieving market penetration. No matter what pricing appraoch is selected, care must be exercised so that the new business does not find itself tied to a strategy that will have an overall negative effect on the business. Probably the safest starting point for a new business is current market level pricing because of the risks associated with starting at below or above market levels. Starting above market levels may not encourage trial, while starting below market levels might indicate to potential consumers that the product is of lower quality. Starting at current market levels will give the new entrepreneur the necessary flexibility so that moves can be made in either direction at a later date to match the changing objectives of the business.

If after the new business has been established the owner decides to seek greater market penetration, it would be wise to reduce the price for a limited period of time. One way that sales made on a wholesale basis can be limited is by making sure that in the terms of sale a very specific date for taking action is included. When sales are being made on a retail basis, a very good way to limit the price reduction is by using supplementary cents off labels which indicate a temporary price reduction, such as twenty cents off the normal retail. By using such a technique, the new business can avoid getting locked into a pricing situation that might not be economical over a long period of time. Many business firms have made price reductions over prolonged periods of time only to find it very difficult to move back to regular price because consumers perceive the sale price to be the regular price.

Moving to a price above market level is equally hazardous. Great care should be taken when moving in this direction since sales may come to a very abrupt halt. If a price is going to be established above market levels, the new business will find it necessary to sell consumers on the idea that it has a superior product. Several technqiues can be used to accomplish this objective. The most frequently used approach is a unique label and package or container design. While at first this may convince consumers that a product is unique, if the ingredients do not back this image up, the business will find it difficult to make repeat sales. A move to higher than market price should be the product of a careful marketing analysis on the part of the new business owner since there is not much room for error when a new business is being established.

No pricing program should be established without determining what the individual firm's costs of doing business are. Only by making a careful analysis of costs can a new business owner select the right pricing program to fit the needs of the business and ensure future growth. Having a clear understanding of costs is very important, especially when a below market pricing program is going to be used. Because a new business selling honey is often started as a result of a hobby, there is often a tendency to overlook costs that should be included in the cost of the product such as phone calls or postage used when ordering supplies and gasoline used to pick up and deliver various items. It is recommended that a careful list of all expenditures associated with the enterprise be maintained so that realistic prices can be established that cover costs and still provide for a reasonable return. It is no fun to start a business and find out at a later point it is still a hobby.

Several other mistakes that many new business owners make that could be avoided by having good cost information and sound sales information are those of never offering a price reduction or pricing a product too high. All business firms' growth is fueled by sales volume. Merchandise turnover should not be forgotten when making pricing decisions. Only by blending turnover and price mark-up can a business grow. Remember, a mark-up of 100% is still nothing unless the product sells. All prices should be set to maximize merchandise movement while maximizing an owner's return. Records should be maintained of all sales at varous price levels. It could be that by offering a temporary price reduction, sales could be dramatically increased along with profits. For the sake of illustration, let us assume that Product A has a cost of $.80 per pound and that it is selling for $1.40 per pound. If sales were 100 pounds, this would return $60.00 profit; however, if by selling Product A at $1.30 per pound sales could be increased to 150

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SUGAR: Wax Ration In Comb Building

By TIBOR I. SZABO
Agriculture Canada, Research Station, Box 29 Beaverlodge, Alberta Canada TOH OCO

SUMMARY

After the main nectar flow, 24 colonies of honey bees were fed, and used to build combs from wax foundation. During an 8-day period, the optimum sugar: wax ratio occured in colonies weighing 6 kg of bees. In colonies weighing more or less than 6 kg of bees the sugar: wax ratio increased. Mean sugar: wax ratio of 7.8:1 and the range was 1.6:1 to 22.4:1.

INTRODUCTION

A recent paper (Szabo, 1977) described the effects of colony size and ambient temperature on comb building and sugar consumption by honey bees in natural environments. The ratio of the weight of sugar consumed to the weight of wax produced was not mentioned. For a comparison of the effectiveness of comb building after the honey flow with wax production during different time periods and in different geographical places, the knowledge of sugar and wax ration is important. By using the same data as Szabo, 1977, the honey: wax ratio is presented in this paper.

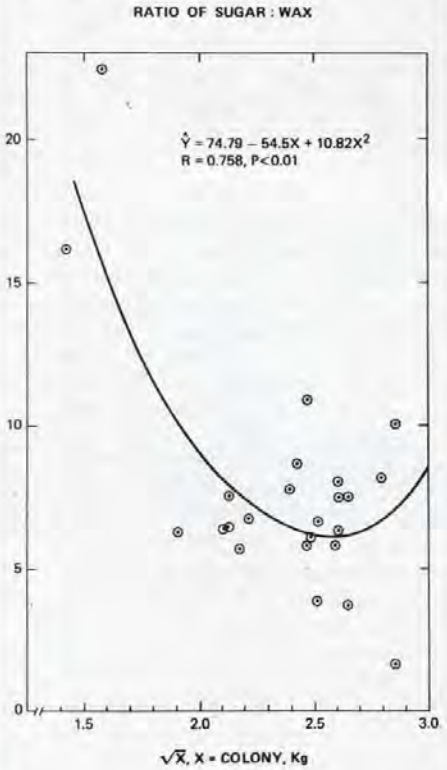
MATERIALS AND METHODS

Materials and methods are identical with Szabo (1977). After the nectar flow, from 11 August to 19 September 1975, four colonies were used for each of the six comb building periods. The honey bee colonies were shaken from their hives into new hives equipped with foundation frames. During comb building a total of 14.52 kg sugar per colony was continuously fed in the form of diluted honey (60% sugar content). Four days after shaking the fully built combs were exchanged with foundation frames. Eight days after shaking, comb building was terminated and the built combs were measured. The quantity of wax was calculated from the weight difference between 30 foundation frames and fully built empty combs. The weight of sugar consumption was calculated from the weight fed minus the weight extracted.

RESULTS AND DISCUSSION

During the eight-day comb building periods a relationship was found between the ratio of the amount of sugar used to the amount of wax produced and the colony size. (Fig. 1). The regression equation is $Y = 74.79 - 54.5x + 10.82x^2$ ($P < 0.01$, $R = 0.758$, Error DF = 21, Error MS = 7.996, SE of b = 15.947, and of b^2 = 3.624). The ratio of sugar used to wax production was highest in small and large colonies and the lowest ration was in medium (approximately 6 kg) colonies. The mean sugar: wax ration was 7.8:1 and the range was 1.6:1 to 22.4:1.

The present paper shows the high sugar: wax ratio could depend on colony size, however many other factors were affecting this ratio. Szabo (1977) found that the mean-maximum and mean-maximum temperatures during comb building greatly affected the comb building and wax production of a colony. Thus, by choosing the proper colony size and time period (Szabo 1977) the effectiveness of fall comb building could be greatly improved.



Whitcomb (1946) calculated an average honey: wax ratio of 8:4:1 in Louisiana from July 14 to September 22, 1942. This is an approximately 6.7:1, sugar: wax ratio and just slightly better than the average ratio of 7.8:1 of the present paper. This indicates that wax production can be successfuly implemented in northern regions. According to current price, wax production may not be economical. However, comb production and drawing out foundation present a different situation. The value of fully built combs is relatively high. Combs are essential for honey production. Removing old, damaged and diseased combs and replacing them with newly built ones is of economical advantage to the beekeeper.

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PRICING POLICIES

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pounds. our profit would be $75.00. The profit would be even higher since we are not taking into consideration that many fixed costs would remain the same. Only by conducting sales research and maintaining records can a business owner find the ideal selling price.

There is not a magical formula that one can offer for pricing that will fit all situations. However, by thinking things through, planning, and keeping records, many pricing decision errors can be avoided and profits improved. □

Questions and Answers

Q. I plan to move to the woods and expand my beekeeping, but there is no farming there and few nectar-producing wild flowers. Can you recommend seeds for honey plants for such an area? Also, what books would you recommend for someone wanting to make a living from beekeeping? **Alan Cogswell, Kirklan, IN**

A. It never pays to cultivate plants just for their honey-producing potential, even in the case of such reliable plants as clover and rape. I think there would be no hope of significantly increasing honey yields this way in wooded areas. One place that specializes in seeds and plants for the beekeepers is Pellet Gardens, Atlantic, Iowa. As for books, most libraries have Frank Pellet's *A Living From Bees.* **It is out of print and also out of date. the last chapter of** *The Joys of Beekeeping* **(Linden Books, Interlaken, NY) discusses the possibility of making a living keeping bees on a fairly small scale without hired help.**

—Richard Taylor

Q. How do you keep ants out of a hive? Tangle-foot glazes over, the ants walk right across axle grease, mixing grease and motor oil didn't work, nor did kerosene painted on the hive stand legs. Diazinon did not stop them, and when I put the legs in pans of oil too many bees drowned in them. **Dennis Wellman, Johnstown, Ohio.**

A. Ants almost never get into the hive of a strong colony in a temperate climate like yours. The bees keep them out very easily. They are most likely to nest between the inner and outer covers, and are a nuisance to the beekeeper, but rarely to the bees themselves. There is a very simple way to keep ants off the inner cover: Leave the inner cover hole open, so that it is accessible to the bees.

—Richard Taylor

Q. I am responsible for maintaining an observation hive at a nature center. Can you refer me to any written material on this? **J.E. Carter, Honeoye Falls, NY.**

A. The bees of an observation hive must have free access to the outside, and they function as a normal, though minute, colony. The only problems are (1) preventing them from starving during dearths of nectar, (2) preventing the colony from becoming too congested, and (3) preventing any stings to the public, if the hive is in a public place like your nature center. Advice on these and other matters can be found in *ABC & XYZ of Bee Culture,* **in my own** *How-to-do-it Book of Beekeeping,* **and in Karl Showler's** *The Observation Hive,* **publishers of which I will be glad to supply on request.**

—Richard Taylor

Q. My bees cluster on the front of the hive and seem to be working back and forth as though they were trying to clean the hive. What does this mean? **Howard Miller, Lenoxville, PA.**

A. This is the so-called "washboard" behavior. It is fairly common in late summer, after the main nectar flows. The bees, usually facing downward on the front of the hive, exhibit movements resembling those of someone scrubbing things on a washboard. Its significance is not known. I have heard many explanations, none of them very plausible, but the most entertaining one being that the bees are limbering up their aching joints after the toil of the honey flow. Norman Gary goes only so far as to suggest that the bees are "probably" cleaning and polishing the hive (Grout, *Hive and the Honey Bee,* **1975, p. 219). No one really knows.**

—Richard Taylor

Q. I've gone from three hives last year to thirteen this year, and now I'm going to be marketing jars, squeeze bears and circular sections. How do I arrive at a proper wholesale price, taking account of my labor, investment, travel costs, etc.? **Edward Fournier, Amenia, NY**

A. You have to be guided by prevailing prices, which are comprehensively set forth in the July '84 issue of *Gleanings,* **p. 349. If your honey, and especially your round sections, are of decidedly superior quality, then charge more. It is fairly common for grocers and health food stores to arrive at their retail price of specialty items by dividing the wholesale price in half then adding that amount, thus getting a dollar and a half retail for each dollar wholesale. Roadside stands usually mark honey up a third or less. There is no set formula. As for your investment and costs of production, these may figure in your income tax returns, but will have little to do with what you get for your crop. And as for your own labor, this will having nothing to do with your taxes or your prices, but only with the question whether you find it worthwhile to keep bees.**

—Richard Taylor

Q. We have had several plastic pails of honey stored in the basement for about two years, and now we find that it smells bad. Can it be fed back to the bees? **Sideline Beekeeper, MacDonald, PA**

A. The honey has doubtless begun to ferment. You might find that fermentation has set in only near the surface and that, beneath that, the honey is still okay, so that you would need only to separate the top layer from the rest. Honey should never be stored in a basement, even if sealed. It absorbs dampness, which starts fermentation. Yes, it can be fed back to the bees while the weather is still warm, though you probably need to dilute it with warm water so they can suck it from the feeder. The bees will remove the traces of fermentation, and the honey will not hurt them.

—Richard Taylor

Q. Do regular moth balls work to control wax moths in stored combs? **George M. Conner, Hutchinson, KS**

A. The two substances easily available for protecting fabrics against clothes moths are napthalene and paradichlorobenzene, both white and similar in appearance. Moth balls, as well as moth flakes, are usually napthlene, while paradichlorobenzene, often sold under the name "paradi," is crystals. Neither is harmful, but the latter, paradi, is what should be used to protect combs. The crystals should be placed on pieces of newspaper above the combs to be fumigated. The combs must then be aired thoroughly for a day or two before returning them to the bees.

—Richard Taylor

Q. I started a colony with package bees in May, added a super of foundation over an excluder when the combs below had been drawn, but the bees ignored the super. I removed the excluder, whereupon the bees began to draw the foundation in the super and store nectar. When I again inserted the excluder, the bees abandoned the super. Is there any way to get the bees to pass up through the excluder? **John Russell, Deer Isle, ME**

A. Your experience tends to confirm the claim, often made, that excluders do inhibit the bees from working in the

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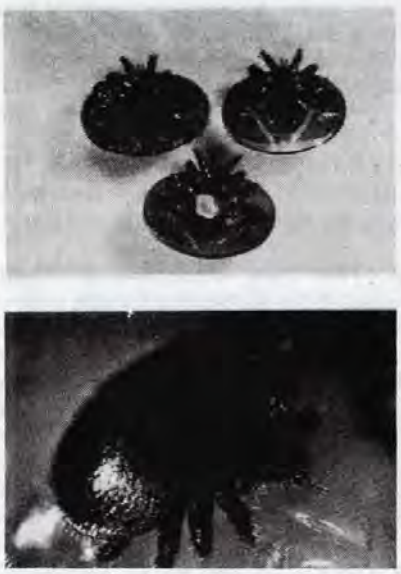
Varroa, Face to Face

by ROBERT CUCULLU 121 Citizen St. Bay St. Louis, MS 39520

On January 4, 1984, I visited the West German beekeeping institute in Erlander, near Nurnberg. My vacation was being paid for by the sale of my honey crop so I was anxious to learn what I could about the dreaded Varroa mite and its devistating impact. I was accompanied by my friends Gisela Bosch and Gisela Hanke, formerly a hobbyist beekeeper. It was a windy day, near freezing with patches of snow on the ground as we arrived about eleven in the morning.

We met with Dr. Dietrich Mautz, an expert on varroa. He began our tour by showing us their extensive library and classroom. I was quite impressed by the book collection but he noted that the library



Varroa Mite

at Cornell University was much better!

He explained that the institute is the oldest of its kind in Germany having been founded in 1907. Its job is to teach beekeeping, which is an official profession (like for instance engineering) and to register beekeepers. They also register apprentices and give them exams. They serve the Bavaria area, which has about 30,000 beekeepers, 50% of whom are over 60 years old. They average 15 hives each.

Then Dr. Mautz led us to their display room. It included diseases of every major type with the exception of Varroa. There were good examples of chalk brood, nosema, sacbrood, European foulbrood and American foulbrood. He said that the AFB came from imported honey — how well we know that sad story. There were many wooden models of bee physiology and different types of bees and their hives. In a glass box they had a stingless bee hive obtained from Brazil in 1913. There was also a display of equipment used in raising queens.

As a former queen producer in Cade, Louisiana I was very interested in the display of plastic queen cell cups which I had never used. He told me that they had researched for years to find out it was necessary for the cups to be placed on either wooden buttons or wooden and waxed buttons. Plastic buttons and cups caused the nurse bees to not feed the grafted larvaes.

Their baby nucs consist of only 50 to 60 grams of nurse bees which are queenless for only four hours. After mating queens are removed and the bees are destroyed and replaced.

In the early 1970's a Czechoslovakian scientist revealed that Varroa mites were in Western Russia and were expected to spread to Europe. The reports of its spread came from Rumania, Bulgaria, Greece and Hungary. Then in January, 1977 it was discovered in West Germany near Frankfort. Currently Varroa is found in eastern France, Belgium, Holland, Luxemberg, Italy, Austria and every country east of Germany and Finland.

In 1975 the government research laboratory in Oberkasse, West Germany, imported ten Carniolan queens from Romania. The director, Dr. Ruetner, attended a symposium of Romanian scientists in the Fall of 1976.

There it was revealed that Varroa was already in Romania. Dr. Ruetner then looked in the Oberkasse colonies but didn't find any mites. Then in January 1977 Varroa was found in bottom board debris, amongst wax particles from uncapped winter honey supplies.

The next winter Varroa was found by putting bottom board debris, wax particles, dead bees, etc., on white paper and carefully looking at it under a good light. The mites are about pin head size being 7.1 mm in length and brown in color. Varroa can be found anywhere on bees, especially under lower abdominal segments, where the wax is extruded. They feast on the bees body fluid.

When the infection rate is low they are best found by shaking 300-500 bees into benzine, then strained through a filter of two to three mm which allows the mites to pass through. They are also found on sealed brood.

Currently in West Germany Varroa is detected by placing a plastic sheet on the bottom board under a bee excluder. The colony is fumigated and the sheet is col-

Robert Cucullu and Gisela Hanke

lected. Then the material, dead bee parts, Varroa bodies, etc., is dried and put into a 96% alcohol solution. The mixture is briskly stirred and the Varroa bodies rise to the top. Then they are counted and a record is kept of the number found in each hive.

Varroa males are only found in sealed brood cells. They have soft bodies and are white in color and die shortly after mating, which takes place in the sealed cells.

The Varroa life cycle begins as an egg deposited on sealed brood, with a slight

Continued on next page

preference for drone brood. The eggs develop to their first stage in 24 hours. In the fifth or sixth day they are an imago and by the thirteenth day an adult. The mites mate before the bee emerges, at which time the young mites get free.

After 24 hours the first mite eggs are laid on unsealed brood. The first egg is female and, like bees diploid. The second egg is male and haploid. Then female eggs are laid. The mites have a total lifetime of up to two hundred days. The young mites feast on the developing bees crippling their wings and stunting body growth.

Currently in the U.S. Varroa mites are not known to occur. There is however a bee louse, *Braula cocca* which resembles Varroa. It is about the same size but it has six legs, whereas Varroa has eight. *Braula cocca* also has a head and thorax which Varroa does not.

I asked Dr. Mautz if it were possible we could import Varroa on pollen or other bee products and equipment. He said no as they only live four to seven days off bees. So only live bees could bring it in. Furthermore the mites have never been found on flowers.

In Germany they use Carniolan bees. They have a very quick Spring buildup and stop brood production at the end of the fall honey flow. The absence of brood is what allows the chemical treatment to kill 98% percent of the mites. In the U.S. however, especially in the warmer regions, there is brood from Italian bees present all year long. This makes fumigation very ineffective.

Dr. Mautz gave me a few very dead Varroa mites. I am pleased to make them available to beekeeping educational centers. Please write me, Robert Cucullu, in care of 121 Citizen St., Bay St. Louis, Miss. 39520.

I wish to thank Dr. Mautz for his very valuable information. Also my hosts and friends who made it all possible, Gisela Bosch and Gisela Hanke.

Gadget Section

By Kathy & Roger Hultgren 155 Lowell Rd. Holden, Mass. 01520

CANDLE MOLD HOLDER

Material:
Piece of pine board
Small wood scraps
2 Screws
6 Nails
Sponge

Production:
A) cut board about 2 inches wider than mold and 4 inches longer than mold.
B) nail side holders in place.
C) nail end supports and cut pressure wooden pieces.
D) Screw pressure pieces in place.
E) Cut sponge to fit mold base.

Purpose:
To hold the dampened sponge beneath a candle mold firmly to allow wax to solidify in the mold tip and to prevent wax from escaping. This holder allows the beekeeper to free his hands which otherwise would be pressing the mold into the sponge.

To Catch A Swarm

by MALCOLM D. RYDBERG
5 Berkeley Road East Greenwich, R.I. 02818

Tuesday, 10:15 A.M., temperature 65°F.; the third hive from the end swarmed into my neighbor's Holly Tree. Initially there were four clumps of bees in the tree, each between 15 and 20 feet high, and close to the ends of the branches. The bees were much too high for a step ladder, and too far out on the branch for an extension ladder.

I had heard that Mr. Frank Eklof, former President of the Rhode Island Beekeepers Association, had developed an ingenious device for catching swarms. Since there was no way that I could see to retrieve the bees I contacted Mr. Eklof. The device is a pole about 15 feet long. A stove pipe chimney about two feet long and 20 inches in diameter is attached to the end of the pole by duct tape, the far end of the chimney has a flarred fitting increasing the diameter to 26 inches. The bottom of the chimney is closed by a heavy piece of cloth duct taped to the bottom.

After getting myself and an empty hive ready, I positioned the device directly beneath the largest clump of bees. I jerked the pole up hard and the bees fell into the stove pipe. I carefully lowered the stove pipe and dumped the bees into an empty hive. My wife was standing about 20 feet away and she directed me in positioning the stove pipe under the bees. I could see that with just a little practice I'd be a real pro. I'm sure that this swarm would have been lost if it hadn't been for Mr. Eklof's invention.

I suggest that my fellow beekeepers consider making up a catcher. You'll be amazed at how well it works.□

Bee Talk

By RICHARD TAYLOR
Route 3
Trumansburg, N.Y. 14886

The heady excitement of beekeeping that we enjoyed in the 'seventies seems to have waned somewhat. Honey sales though they are pretty good, are not what they were. My honey stand has been a rather good barometer for this. I offer the same honey there, have the same honey signs up and down the road— if fact, a few more— but not as many people stop by. I don't remember just when I started my honey stand; must have been more than 12 years ago. So I get a pretty good idea of what the demand for honey is from one year to the next. It seems to be down about a third from what it was a few years ago, in terms of the number of customers.. Of course there are other factors. Honey costs more now, and it is more readily available in stores. All the same, I think people have changed. They used to ask me whether my honey was "organic". I never hear that question anymore. For several years people were thinking about getting back to the simple life, to the good earth, back to basic values and to nature. That was good for beekeeping, because the beekeeper seems to exemplify all those things. Now things are tending in other directions.

Still, the beekeeper's life is very good, and for those who, like me, were practically born wanting to keep bees, nothing has really changed. My honey stand does not make me rich, but it never did. It provides a small but steady influx of cash, and a lot of joy. We offer home-made bread there about one day a week, putting a sign to that effect out in the yard on that day. This generates considerable excitement and, for an hour or so, quite a cash flow. People can smell the warm bread as they approach the stand, and away it goes, sometimes two or three loaves at a time.

This is, in my opinion, the way to be a beekeeper these days. Make it a profitable sideline— more than a hobby, but considerably less than a commercial enterprise. The commerical beekeepers, at least those I know, are not having a very good time of it. One, a friend of mine, is simply selling his entire crop to the government. That approach surely robs beekeeping of something precious, in terms of personal satisfaction. Another friend, who has a healthy disdain for any commercial dealings with government, is selling his whole crop to a packer, for considerably less, taking what he can get, and reconciling himself to waiting several months for the final payments. All this, it seems to me, illustrates the main problem of trying to be a commercial beekeeper. You are too much at the mercy of forces over which you have no control.

Of course there are lots of things a sideliner like me cannot control either. I can't decide when to have it rain or shine, nor can I compel people to drive in at my honey stand. But I, and I alone, decide the price, which is important. I'm getting a dollar seventy-five for my circular comb honey sections, and sales on these are better than ever. That is partly due to a simple little idea I put into effect for promoting comb honey, an idea that I'll pass along to readers next summer, when it may be useful to them too. And there are other things about which I can exercise independence. Much of my glassware, for example, costs me nothing. I save all sorts of jars, from juice, popcorn, coffee, whatever, and offer honey in these. Customers like that. It adds a bit of authenticity. But best of all, of course, I am not caught in any squeeze between middlemen and packers, wanting to pay me less, and hired hands, wanting me to pay them more. It all gives me a lordly sense of independence, and an added sense of security, too, when each evening I tally up the day's proceeds from the honey stand.

The season is drawing to a close now. I usually shut the honey stand down for the winter by the end of October. Then some afternoon when I feel like it I'll melt up the accumulated beeswax, to convert to foundation for next year's comb honey crop, and, from time to time, when I feel like it, I'll stoke up the little stove in my honey house, repair some equipment, and get ready for another season of doing things my own way, my success and happiness pretty much in my own hands, beholden to no one.

[Questions are invited. Please enclose stamped addressed envelope.]

QUESTIONS & ANSWERS

Continued from Page 611

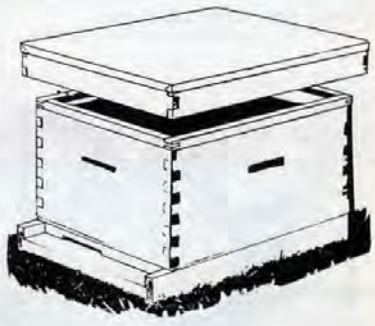
supers. What it takes to get them to pass readily through an excluder is a good honey flow, and this, of course, is something that you might just eliminate the excluder, hope that the bees will keep their brood nest down below, and that you can get some kind of crop from the minor honey flows.
— Richard Taylor

Q. I extracted honey from more than one source at the same time, getting batches of mixed color that will not mix, even when heated. Is there any way to correct this? **William Spence, Houston, TX**

A. It is unusual for different honeys not to blend, but it does sometimes happen, in case the honeys are of quite different composition; for instance, in case one has a much great proportion of levulose. There is no way to blend such honeys to uniform appearance, although the condition, is of course, harmless.
—Richard Taylor

Q. What happens when blood donated by a beekeeper is given to a person who is allergic to bee venom? **Jim Reed, Bar Harbor, ME**

A. Nothing. The venom received by a beekeeper from time to time through stings does not remain in the blood stream.
—Richard Taylor



Let's Buzz The Schools

By STEVE FORREST

Everyday teachers all across the United States teach millions of young consumers about our world. With your help, we can get these teachers working for us teaching about bees and promoting our industry. We have produced a unit of study (lesson plan) for teachers that when adopted by your school system will teach a mini-course in beekeeping and do it year after year and child after child. Upon completion of this unit the children will know how important bees are and what honey is.

At last years meeting of the Southern States Beekeepers' Federation it was decided to produce and distribute a kit of sorts to help beekeepers approach elementary schools. The materials and strategy were to be produced and tested in Virginia and North Carolina during the year and the promotion would be kicked off at this year's meeting November 11-14 in Williamsburg, Virginia. In the process of putting this together we were approached by Claudia Linkous an elementary school teacher in the Wake County (Raleigh, N.C.) school system. She needed help on a unit of study and contacted Dr. John Ambrose, our secretary-treasurer. He realized that her approach was better than ours and their combined efforts have produced a tool for promoting our industry to elementary school children that is without equal. If we can get these materials to the teachers they will do the instruction and promotion for us. All you have to do is approach your local school superintendent and give him/her a copy of our unit and ask for their approval and use. Copies are available from Dr. John Ambrose, North Carolina State University, Box 7626, Raleigh, N.C. 27695-7626 at a cost of $3.00 each plus $2.00 postage.

The unit is 49 pages long and contains activities and materials for 13 days of instruction. There is a variety of activities from making an insect collection to experiencing pollination with a bee made from a pipe cleaner. A seventy-word vocabulary is stressed throughout the unit in a variety of activities. Tests are included, there is an enlarged diagram of a honeybee with labeled body parts, and many more activities too numerous to mention. A better approach for your understanding of the unit might be to list for you the objectives of the course. An objective is what the teachers hope to accomplish from the unit of study. The objectives for this unit are that upon completion of this unit a pupil will be able to state:

1. That the honeybee is an insect friend, not an enemy.
2. That the honeybee's "sting" is used only as a defense.
3. That there are three different types of honeybees and their importance to the hive.
4. How honey is made and how the weather will effect their food sources.
5. How the honeybees use wax, honey, and propolis.
6. How the honeybees communicate with each other.
7. How honeybees live and function in their hives.
8. What is swarming and why it occurs.
9. How man use the honeybees.
10. The importance of honeybees to man.
11. How to compare and contrast honeybees with other insects.

We are putting the ball in your court. If you will take this unit and have it approved in your local school system the children of your community will know how important bees are and what honey is. If you don't, they won't. Now is the time to get to work. Let's all get together and Buzz the Schools!

This article is the kick-off for this promotion. At our convention in Williamsburg this month, November 11-14, Dr. Ambrose will address the meeting concerning this unit and Mrs. Linkous will be in attendance. Every primary registrant at the convention will receive a copy of this unit and hopefully the drive to start to work. We welcome anyone and everyone. Registration forms are also available from Dr. Ambrose at the above address.☐

OBITUARIES

P.F. ROY THURBER passed away quietly in his sleep in a Seattle, Washington hospital on September 15, 1984. He was 68 years old. He is survived by his wife, two sisters, a daughter and two grandchildren.

Roy was born in San Antonio, Texas but moved to Seattle in 1935. He retired as a Lt. Colonel in the Army Reserve and then as chief real estate appraiser for a local bank in 1972.

He kept bees for twenty-four years and was very active in western Washington local bee associations. Among his accomplishments were: Five years as a county bee inspector, lobbyist against misuse of agricultural chemicals, instructor in several beekeeping classes, President and director of Puget Sound Beekeepers Association and he helped engineer zoning laws in Seattle and Bellvue. These laws have been the model for other cities in Washington and reviewed by others nationwide in the attempt to create regulations less restrictive to beekeeping. But of all of Roy's efforts on behalf of the U.S. beekeeping, nothing could be more important than his work with ethylene oxide fumigation and the reaction of the first mobile fumigator in 1969. His work in the prevention and control of bee diseases has been tireless.

His many articles in all three national industry journals on the many aspects of beekeeping have been instructive and thought provoking

Roy will be missed by all of his friends and acquaintances.

A personal note from the editorial staff of *Gleanings In Bee Culture:*

Those of use in the beekeeping press, *GBC, ABJ and SPEEDY BEE,* **were very familiar with Roy Thurber through his numerous and valuable contributions of articles, ideas and informed thoughts about beekeeping. Indirectly, therefore, many of you, who never met Mr. Thurber, learned from him and became better beekeepers because of his insight into the behavior of bees. Mr. Thurber was one of those folks who became incredibly wrapped up in his beekeeping activities — a continuing case of bee fever, you might say. Mr. Thurber was a man of abounding energy, honesty and loyalty to friends. He stands as an example to all of us who are honored to have been among those who grew better because of having known him.**

Mark Bruner

John Root

NEWS and EVENTS

1984-85 Kentucky State Honey Queen

Sandra K. Erpenbeck

Sandra K. Erpenbeck has been selected the 1984-85 Honey Queen for the state of Kentucky. She is the daughter of Mr. & Mrs. Robert Erpenbeck, beekeepers in Edgewood, Kentucky, and is a student at Northern Kentucky University where she is majoring in Graphic Arts.

Sandra has been traveling thoughout the state promoting the use of honey and awareness of the environmental importance of honey bees.

Ohio State Beekeepers Association

The Ohio State Beekeepers' Association will hold their fall meeting in Columbus in the Capital University "Bridge of Learning Center", Room 104, on November 17. The trustees will meet at 7:30 the preceding evening.

Among the speakers for the Saturday meeting, beginning at 9:00 A.M., will be Phil Mariola, Mark Bruner, Kim Fondyke and James Tew. This is the Annual Meeting with recognition of the Beekeeper of the Year and election of officers.

Steve Lundin Montana Delegate

Steve Lundin was selected as Eastern Montana Beekeepers Association delegate to Western Apicultural Society to replace Nick C. Doll when his responsibilities terminated. At the same election Steve was name President of the Montana Association.

Steve lives with his wife Bonnie and three children, Matt, Wade and Thea at 6830 Pinto, Shepherd, Montana.

Bees have been with Steve all of his life as there were commercial operators on his parent's ranch near Lewistown, Montana. This introduction to beekeeping kept him busy and thinking. In 1978 he went into beekeeping on an extended sideline basis. Steve likes three-banded Italian bees from California and uses eight-frame equipment. The hive bodies are light enough for easy transportation to his out yards and for his children to handle. Steve utilizes migratory operations and needs the smaller hive bodies to keep the weight within reasonable limits. He makes splits in his home yard and moves the new colonies to out yards in counties and adjoining Yellowstone County, Montana.

A 4-H honey show was established by Steve in conjunction with the Yellowstone Fairtime Exhibition, Billings, Montana. It has been progressed and provides the 4-H members with a place to exhibit their beekeeping skill and project products. Steve is the 4-H instructor in beekeeping and his students are excellent beekeepers and exhibitors.

Steve has 160 colonies and estimates an average of 120 pounds of honey per colony. He produces both liquid and comb honey. His comb honey is produced under the "shook swarm" method. His liquid honey is sold primarily in 10 pound containers through stores and by gift boxes during the holidays.

As EMBA president, Steve inherited unfinished business from former officers and he is cleaning up the slate for his successors. His greatest achievement has been getting the association constitution completed and approved. Steve also continues to have door prizes to finance club activities and has purchased a screened enclosure to demonstrate bee hive manipulations at the association's fairtime exhibition booth. This is an educational exhibit and has been a fairtime favorite. In 1984 the fair goers will be presented a new

Steve Lundin, Eastern Montana Beekeepers Association President and Montana delegate to Western Apiculture Society. Photo by Al Bell.

show — a beekeeper in a cage with bees — the daredevil of the fair.

Under Steve, association members also began contributions of honey to the Billings foodbank for distribution to needy people during Thanksgiving and Christmas. The local service organizations prepare holiday food baskets and add a jar of honey for a treat. The recipients are very pleased and appreciative. This taste of honey should carry over to the time they begin shopping for food when the economy improves.

Nick Doll's replacement will also attend WAS conferences. Nick won a ribbon at the 1983 honey show and Steve plans to prepare an exhibit of Montana honey for the 1984 competition.

Ohio State Honey Queen 1984-1985

Ohio State Honey Queen Elidee Jean Baston was crowned July 14th at the two day summer meeting of the Ohio State Beekeepers meeting this year at Baldwin Wallace College, Berea, Ohio. Elidee will promote honey and the beekeeping industries until next July's summer meeting. One of her many duties will be to reign over the Queens Castle with her princess Amy Williams and American Honey Queen Carol Tschida at the Ohio Honey Festival which is always the second weekend in September, Thursday, Friday and Saturday.

Elidee is 19, the daughter of Clyde and Joyce Baston, Maineville, Ohio. So far this year Elidee helped hostess the Agriculture Hall of Fame Breakfast, was in the Queen

Continued on next page

Elidee Jean Baston, 19, daughter of Clyde Elwood and Joyce Elaine Baston, Maineville, Ohio 45039.

of Queens contest and with Amy passed out their folders at the Agriculture building at the Ohio State Fair in August.

Come visit the Honey Festival. If not this year, next. We'll be looking for you at the Queens Castle where we demonstrate the use of honey in baking and offer 14-18 different flavors of honey to taste along with comb, creamed and honey and butter. The bee beard is put on three times each day and much, much more.

Ohio State Honey Princess, Amy Williams 19, daughter of Willis and Shirley Williams, Lexington, Ohio.

Montana

The Montana Beekeepers will have its annual meeting on November 16-17 at the Sheraton Hotel in Great Falls, Montana.

President Morris Dahle of Sidney, Montana will preside.

Main speaker will be Dr. Joseph Moffett, USDS Laboratory — Department of Entomology, Stillwater, Oklahoma.

For information, contact 445 Addison Square, Kalispell, Montana 59901.

Bees Bring Alabama Farmers Big Bucks

by ROLLIN MOSELEY

Alabama farmers could lose up to $400 million a year were it not for the state's $2 million honey bee industry, according to a state bee expert, Carl Dennis.

Dennis, apiculturist with the Alabama Cooperative Extension Service since 1968, said honey bees are a misunderstood insect that "greatly benefit" farmers by pollinating some 100,000 acres of crops each year in the state. He said without the help of bees, Alabama growers of fruits, vegetables and other seed crops might lose as much as $400 million annually.

Dennis said the more than 4,000 hobby and commercial beekeepers in the state have almost 45,000 colonies, producing honey as well as queens and workers that are sold to northern beekeepers where cold weather depletes the colony sizes.

Dennis said the majority of bees kept in Alabama are of the commercial variety and produce up to two million pounds of honey each year.

Frank Randle, owner of Randle Farms near Auburn, said there are about a dozen major commercial bee farmers in the state, with the largest outfit located near Hayneville. The Hayneville firm has some 8,000 colonies of bees, while he maintains 1,000 colonies for both honey production and bee sales.

Randle said a large part of his business involves placing bee colonies near a farmer's field for a fee. The bees help pollinate the farmer's crop and increase the yield.

Dennis said the industry nationwide has been hurt in recent years by honey imports, even though the American-produced honey is generally considered superior to that of other nations.

The root of the problem for U.S. honey producers is a one-cent tariff level that was adopted 40 years ago when honey sold for nine cents per pound. Since the tariff was imposed the price range has risen in the U.S. by 500-600 percent, but foreign countries are able to produce inferior brands for as little as 15 cents per pound.

Dennis said American beekeepers have been "drowned with foreign honey" and forced to turn over record amounts of honey to the federal government. A federal price-support program allows beekeepers to take out a loan for their honey and store it for a year. The honey then can be sold later when prices improve and the loan is repaid with interest.

Recently, however, prices have not improved and many beekeepers have taken the option of forfeiting the honey, rather than repaying the loan. The government then is left with the excess honey, which is used in surplus commodity programs.

Utah

The Wasatch Beekeepers Association was organized in Utah. The first meeting was held April 18, 1984 with about 45 people present. The Wasatch Beekeepers Association includes beekeepers in Salt Lake, Utah, Davis, Weber and Tooele Counties. Meetings have been held and are scheduled to meet on the second Tuesday of each month except for the month of July and the month of December. Meetings for the balance of the year will be held at 2500 South State Street, Salt Lake City, Utah at 7:00 P.M.

Officers elected in April are: President, Nile Peterson, Vice president, Earl Latimer; Sec/Treas., Byron Anderson; Directors, Harvey Willardson, Orin Furse and Ken Woods.

The purpose of the Association is to help provide education to beekeepers and to promote the common interest and welfare of beekeepers. Meetings are attended by both the hobbyist and commercial beekeepers. Prospective beekeepers are also welcome. The following programs are scheduled:

August 14 — Removing supers and honey house operations.
Sept. 11 — Fall requeening and fall honey plants.
Oct. 9 — Fall feeding and checking stores.
Nov. 13 — Bee breeding.
Jan. 8, 1985 — Honey plants and feeding.
Feb. 12 — Pollen substitutes and spring losses.
Mar. 12 — Installing packages and feeding.
April 9 — Annual Meeting — swarms and divisions.

Anyone having program resource suggestions, project ideas or other helpful hints that will help us achieve our goal, please send them to Nile Peterson, President, 9256 Julie Ann Way, West Jorda, Utah 84084. Telephone 801-561-3123.

Continued on next page

Rolla Chandler, 2144 Manchester Ave., Cardiff, California 92007, poses with his handmade skeps at the Southern California Exposition this past July.

Empire State Honey Producers

The annual winter meeting of the Empire State Honey Producers Association will be held in Syracuse at the Hilton Motor Inn November 30, through December 1st. The Inn is at the junction of the New York State Thruway and Interstate 81. The meeting starts at 10:00 a.m. on Friday and runs through Sunday afternoon.

A featured speaker this year will be Professor Robert Berthold Jr., who will lecture on beeswax and beeswax products. Berthold is well known for his interest and research on the subject and the antique type candle molds that he manufactures. Berthold will also discuss honey marketing including the production of honey-fruit spreads made using the Dyce process for creamed honey.

New York beekeepers suffered a massive honey bee — pesticide loss in about mid-July. It is expected that chemical analysis of the samples taken will be completed by the time of the meeting. Several state officials have been invited to discuss this and the high disease rate in the state as well as related problems.

The meeting is open to members of the association plus anyone else who might be interested in attending. Further information can be obtained by contacting Dr. Roger Morse, Office of Apiculture, Department of Entomology, Cornell University, Ithaca, NY 14853 or by calling him at 607-256-5443.

Colorado Beekeepers Annual Meeting

A full program of speakers of interest to both hobby and commercial beekeepers will be the program at the Colorado Beekeepers Association (CBA) annual meeting. The meeting is scheduled for Saturday and Sunday, December 1st and 2nd, and will take place at the Denver-West Days Inn, 1509 West Colfax Avenue (Colfax at I-70), in Golden, Colorado. At 5:00 P.M. on Saturday the CBA will host a beekeepers social to give members time to socialize and renew old friendships. The annual business meeting will be held on Sunday morning.

The Days Inn has reserved a block of rooms for out-of-town beekeepers attending the meetings. Reservations should be made in advance by writing to the above address or calling (303) 277-0200. Beekeepers should indicate that they are members of the CBA in order to receive special room rates.

All beekeepers are encouraged to attend these meetings. Voting privileges at the business meeting are reserved for dues-paying members of the CBA. Those attending the beekeepers social are requested to bring snack foods. The CBA will provide the usual beverages.

Bee equipment suppliers and manufacturers are also invited to display their products. For further information send a self-addressed stamped envelope to: Randy Fischer, Vice President, Colorado Beekeepers Association, 3007 Moore Lane, Fort Collins, Colorado 80526.

New Mexico Beekeepers Convention

The New Mexico Beekeepers Association will meet for their annual convention December 7th and 8th. A good time talking about bee business is planned. Among the speakers will be Dr. Elbert Jaycox of New Mexico State University and Richard Nunamaker of the Laramie Bee Research Laboratory. The meeting will be held in Albuquerque at the Downtown Quality Inn, 717 Central Ave. NW, Phone (505) 247-1501. Association secretary is Betty Cole, 600 North Bosque Loop, Bosque Farms, N.M. 87068. Everyone is welcome to attend.

Special Bee Problem Seminar Set For Texas Association Meeting

A one-day Seminar on BEE PROBLEMS: HOW TO RECOGNIZE AND SOLVE THEM, will be conducted on November 23rd, during the Annual meeting of the Texas Beekeepers Association, Lufkin, Texas. Concentrated on bee disease, pests, parasites, and queen problems, the course will offer beekeepers of diverse backgrounds an opportunity to learn more techniques of problem recognition and problem solving.

Teaching the Seminar will be Dr. Larry Connor, Beekeeping Education Service, Cheshire, CT. The program will run from 8:30 a.m. to 4:30 p.m.. The registration fee will be $25 per person or $40 per family.

To register for the program, contact Beth Mercer, Rt.1, Box 95-B, Edcouch, Texas 78538. Phone 512-262-1722. The program is con-sponsored by the Texas Beekeepers Association and Beekeeping Education Service.

Book On Microscope Use By Beekeepers

A new book, dealing with microscope use by beekeepers and other naturalists, has been set for an October 15 publication date in England, with the text available in the United States about December 1st. The book "*Microscopy on a Shoestring for Beekeepers and Naturalists*" is written by Owen Meyer, a former General Secretary of the British Bee-Keepers Association, a well known British lecturer, and the author of two earlier books.

Continued on next page

The book makes a thorough examination of the dissecting and compound microscopes and gives valuable suggestions for those wishing to make a microscope for themselves. Instructions for the dissection of honey bees and the preparation of slides are also included. These techniques allow a beekeeper to examine diseases for larval and adult bee diseases as well as pests such as acarine mites.

In North America, the publisher is Dr. Larry Connor's Beekeeping Education Service. With approximately 110 pages, these hard cased books will sell for $13.95. Individual orders should include $1.00 for postage and packing. Quantity discounts are available to dealers and associations.

Fund Raising Starts For Hewitt Honey Bee Museum And Research Center

Mr. Pilomen J. Hewitt, Jr. was a prominent Connecticut beekeeper and a life member of the Eastern Apicultural Society of North America, serving as editor of the EAS Journal until his death in 1980. He was known both nationally and internationally, traveling to many international meetings.

Hewitt lived most of his life in Litchfield Connecticut, and his will left his honey house and collection of beekeeping antiques and collectibles to be converted into a Honey Bee Museum and Research Center.

During the past few years, Friends of Philomen J. Hewitt have worked hard to bring Mr. Hewitt's wishes to reality. They have incorporated a non-profit organization, and have enlisted the services of Mr. Peter Dalton-Morris, a prominent Litchfield architect, who has donated his time and efforts to produce a rendering of a first rate museum and research center, a conversion of the current honey house.

During this past summer, the officers of the Hewitt Honey Bee Museum and Research Center, Inc. initiated a fundraising and membership drive inside Connecticut. Those who did not receive this mailing, including friends of Philomen Hewitt from outside the State of Connecticut, are invited to join the organization, with a $5 individual and $10 family membership.

Additional contributions are requested and greatly needed to bring this plan to reality.

California

The Beekeepers Guild of San Mateo County had a very successful exhibit at the Fair from July 20-29, 1984. In keeping with the Theme, THE 50TH ANNIVERSARY OF SAN MATEO COUNTY FAIR AND FLORAL FIESTA, the exhibit featured in the center, a pyramid of 100 one-pound jars of GOLDEN HONEY.

The display also had child mannikins with an adult mannikin in beekeeping outfits representing a beekeeping family, and the new Kerkhof two-queen Ventilated Hive, in addition to an observation hive and beekeeping equipment.

The California Honey Queen, Pamala Shaw spent two days at the Fair greeting visitors.

The whole exhibit was planned and directed by chairman Scott Twist. The Beekeepers Guild won two awards, Third Place in the competitive Group and an additional award for being best maintained and manned exhibit in the Agricultural building.

Honey Report

Continued from page 573

REGION FIVE

Sourwood somewhat dark this year but selling O.K. at $3.25 a pound. Retail store sales still slow in North Carolina. Florida citrus tree damage a problem putting thousands of acres out of use.

REGION SIX

Fairly good showers in Kentucky late in the month. Some sections had been very dry. Aster ready to bloom. Overall crop good due to early flow. Sales up somewhat but still too slow. Dry Tennessee weather causing some feeding. Market slow but prices steady.

REGION SEVEN

No reports.

REGION EIGHT

Above average crops in Utah because of frequent rains. A lot of last year's crop being sold at low prices. Rain and snow came to Montana the last week of Sept. Feeding west of the Divide in drought areas. Statewide production below normal. Honey darker than normal but good quality.

REGION NINE

Some fall swarms in California. Most hives seem O.K. for winter but no extra honey. A dissapointing honey year. Good crops, though, over most of Washington, with moisture content about 15 percent. Sales slowed down a bit but fairly steady. Bear problems in parts of the state.

***Honey Reporters needed for Regions 4, 5, & 7 — Contact** *Gleanings.*

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Classified rates: 49 cents per word, each insertion, payable in cash in advance. Each initial, each word in names and addresses, the shortest word such as "a" and the longest word possible for the advertiser to use, as well as any number (regardless of how many figures in it) count as one word. Not less than 10 words accepted. Copy or cancellation orders MUST be in by the 1st of the month preceding publication. Send classified ads to the A.I. Root Company, Advertising Dept., GLEANINGS IN BEE CULTURE, Box 706, Medina, Ohio 44258-0706 **Note: BLIND ADS: Any ad sent in that does not contain the seller's Name and Address within the ad, will be charged an additional $6.50 per month.**

MAGAZINES

THE AMERICAN BEEKEEPING FEDERATION needs your support! Join in supporting efforts to stop adulteration, to improve marketing conditions and to encourage the continued research on African Bees and Varroa and Acarine Mites. Send for information, membership application and sample copy of bi-monthly News Letter! Write To: **THE AMERICAN BEEKEEPING FEDERATION, INC., 13637 N.W. 39th Avenue, Gainesville, FL 32606.** TF

THE SCOTTISH BEEKEEPER — Magazine of The Scottish Beekeepers' Association. International in appeal. Scottish in character. Membership terms from A. J. Davidson, 19 Drumblair Crescent, Inverness, Scotland. Sample copy sent, price 20 pence or equivalent. TF

The INTERNATIONAL BEE RESEARCH ASSOCIATION urgently needs your membership and support to continue its work of publishing informatin on bees, beekeeping and hive products. Write for details about publications and the benefits of membership to USA Representative, H. Kolb, P.O. Box 183, 737 West Main, Edmond, OK 73034 (phone (405) 341-0984); or to IBRA, Hill House, Gerrards Cross, Bucks SL9 ONR, UK, regularly publishes new information on bees, beekeeping, and hive products, for beekeepers and scientists all over the world. Mail inquiries from USA: H. Kolb, P.O. Box 183,, 737 West Main, Edmond, OK 73034, Phone: (405) 314-0984. IBRA PUBLISHES: **Bee World,** a quarterly journal for the progressive beekeeper **Apicultural Abstracts,** a survey of scientific literature from all languages. **Journal of Apiculture Research,** for original bee research papers. Books and pamphlets on all beekeeping topics. Catalogues of publications and details of journals and membership $1. Specimen copies of **Bee World**, **Journal of Apicultural Research** or **Apicultural Abstracts** from INTERNATIONAL BEE RESEARCH ASSOCIATION, Hill House, Gerrards Cross, Bucks. SL9 ONR, England. TF

DAIRY GOATS—for milk, pleasure and profit. Excellent for children, women and family! Monthly magazine $11.00 per year ($13.50 outside U.S.A.). DAIRY GOAT JOURNAL, Box 1808 T-3, Scottsdale, Arizona 85252. TF

BEEKEEPING. A West Country Journal—written by beekeepers—for beekeepers. 1.50p inland or 1.80p ($4.00 Overseas). 10 issues yearly. Editor, R. H. Brown, 20 Parkhurst Rd., Torquay, Devon, U.K. Advertising Secretary, C. J. T. Willoughby, Henderbarrow House, Halwill, Beaworthy, Devon, U.K. TF

SCOTTISH BEE JOURNAL. Packed with practical beekeeping. Sample copy from Robert NH Skilling, FRSA, 34 Rennie St., Kilmarnock, Scotland. Published Monthly, $4.00 per annum. TF

BEE CRAFT — Official (monthly) magazine of the British Beekeepers Association. Contains interesting and informative articles. Annual Subscription $5.10 (Surface mail) and $7.10 (Airmail). The Secretary, 15 West Way, Copthorne Bank, Crawley, Sussex, RH10 3DS TF

INDIAN BEE JOURNAL Official organ of the All India Beekeepers' Association, 817, Sadashiv Peth, Poona 411030. The only bee journal of India Published in English, issued quarterly. Furnishes information on Indian bees and articles of interest to beekeepers and bee scientists.

Annual subscription postpaid in foreign countries: For individuals US $7.00 for institutions, companies and corporate bodies US $10.00 or it's equivilent, to be received in advance by IMO or bank draft, payable in Poona (India). TF

WANTED

WANTED—All varieties bee gathered pollen. Must be clean and dry. Pollen traps available. Hubbard Apiaries, Onsted, Mich. 49265. Phone: 517-467-2151. TF

WANTED — Old Beekeeping Books and Bee Journals. James Johnson, 107 State Ave., Terra Alta, W.V. 26764. TF

Wanted — New or used cyanide dust pump also fan & housing only from Kelly bee blower. Tegart Apiaries, Fairview, Alberta Canada. 12/84

HELP WANTED

Help Wanted: 2 Professional bee men for year-round work. Must have large scale queen rearing and package bee experience. Also can use 2 part-time bee men for package season February through May. Absolutely NO DRUG USERS. **Huck Babcock, P.O. Box 2685, West Columbia, SC 29171. Phone: 803-256-2046.** TF

FOR SALE

Protective Clothing for Beekeepers. Write now for brochure. B. J. Sherriff, Dept. GBC P.O. Box 416, Nacoochee, GA 30571 TF

INSEMINATION DEVICES. For prices write Otto Mackenson, Box 1557, Buena Vista, CO 81211 TF

For Sale: clean, fresh, dry, Bee Pollen. $6.50/pound. You pay shipping. Honeycomb Apiaries, R.R. 3, Box 74, Wrightstown (Kaukauna), Wi. 54130. Ph: (414) 532-4314. TF

FOR SALE: Bee Operation on 15 acres. 14' x 60; wood frame building on cement. Also 20' x 30' storage shed. Excellent line of equipment plus 500 hives. 25 yard sites available mostly on Sweet Clover. Call 873-5900, Renaud Realty, Box 416, Tisdale, Sask. SOE ITOTF

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For Sale: Four Hive lifting platform for turck hoist with hand winch, any height, attached on or off in 15 minutes, $115. W.E. Lyman, Greenwich, N.Y 12834. 11/84

Honey Pots for sale, also will buy yours. Write J. Steed, Box 115, Richmond, KY 40475 12/84

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Will consider delivery. Phone 303-857-2445. In Colorado. GJ 12/84

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NOP 11/84

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For Sale: 300 two story colonies, Queen rearing outfit, 69 two ton truck, Kelly loader, good honey outlets. Best offer. Andrew Hutchison, P.O. Box 6993, Boise, ID 87707 TF

For Sale — Canadian Honey in drums and large quantities Beeswax. Tegart Apiaries, Fairview, Alberta Canada. 12/84

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FOR SALE — 325 hives complete includes 300 wintered. Yard locations — Extracting equipment — from Cowan automatic uncapper to scales. 1-ton truck. Misc. equipment. All in fine condition. Asking $44,000 USA funds. Inquire: COX, Box 989, Virden, Manitoba, Canada ROM 2C0. TF

TROPHIES: Stainless Smokers, Chrome Hive Tools. Send embossing details for prices. **SOUTHWESTERN OHIO HIVE PARTS COMPANY, Monroe, OH 45050. 513-539-7258.** 11/84

FOR SALE — 50 colonies $60 each; 200 pollen traps $16 each. Michael Kruckenberg 309-654-2771, Cordova, Illinois 61242. 11/84

100, two, three, four story colonies. 400 queen rearing books with related equipment. Write for prices, details. Stearns, 4605 Redstart, Houston, TX 77035. 11/84

For Sale — NEW SUPERS. 1200. 10-frames. foundation painted $12. 5000 good used brood/honey. 9⅝" supers $10. Shallows $8. covers. bottoms. inners. other equipment available. will deliver.
Bob Bennett (414) 757-5115. Greenville. Wis. 12/84

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Select grade heavy duty frames, all sizes
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ANSWERS FOR TESTING YOUR BEEKEEPING KNOWLEDGE

1. True When cold weather begins in the fall and the honey flow stops, drones are usually forced out into the cold and left to starve. Queenless colonies, however, allow them to stay in the hive indefinitely.

2. **False** Supersedure queen cells are normally produced on the comb surface. In comparison, queen cells produced in preparation for swarming are found along the bottom of the frames.

3. **False** The four pairs of glands that secrete beeswax are located within the last four visible ventral abdominal segments.

4. **True** Honey bees as well as all true bees (Superfamily Apoidea) have some body hairs, particularly those on the thorax that are branched or plumose which aid in pollen collection. This distinctive characteristic is used to separate bees from the wasps. The body hairs of wasps are simple and unbranched.

5. **False** A good nectar flow will usually speed up the recovery of EFB, sacbrood and may aid in helping a colony recover from nosema. Field flights and brood emergence are most helpful with nosema. Nectar flows help with recovery since it forces the bees to catch up on house cleaning chores. With American foulbrood, the bees are unable to remove the scales (spore reservoirs), so once the equipment is contaminated with spores, the colony is doomed.

6. **B**
7. **D**
8. **E**
9. **C**
10. **B**
11. **E**
12. **C**
13. **C or B (vestigial in queens)**
14. **C**
15. **A**

16. The antennal segments are covered with innervated hairs and the other minute sensory structures of several kinds. The exact function of each type of sense organ has been difficult to determine but the principal functions are touch and odor (smell). Other functions that have been suggested include taste, humidity and carbon dioxide monitoring.

17. Head, Thorax, Abdomen

There were a possible 20 points in the test today. 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

20-18 Excellent 17-15 Good 14-12 Fair

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