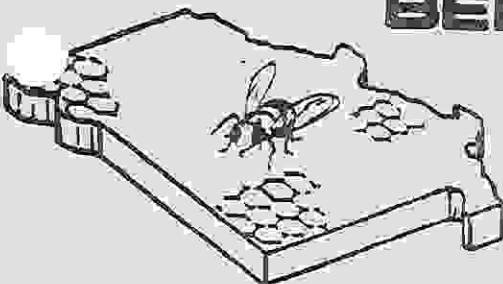


MISSOURI STATE BEEKEEPERS ASSOCIATION



PRESIDENT
Curt Dennis
2415 Johnstown
Florissant, Mo. 63033
(314) 838-4529

SECRETARY
Jim Thaxter
Rt. 4, Box 60 E
Moberly, Mo. 65270
(816) 263-2694

1ST VICE PRESIDENT
Dr. Flermoy Jones
1215 Subella Drive
Columbia, Mo. 65201
(314) 445-5760

TREASURER
Truman C. Hardin
1829 W. Washita
Springfield, Mo. 65807
(417) 866-2602

2ND VICE PRESIDENT
Louis Smith
4301 Walnut Tree
St. Charles, Mo. 63301
(314) 441-3780

EDITOR
Carol Boeckmann
619 Mendelssohn Drive
Kirkwood, Mo. 63122
(314) 821-1856

VOLUME 24

QUARTERLY NEWSLETTER
SEPTEMBER 1986

NUMBER 3

DEAR BEEKEEPING FRIENDS,

The Annual Fall State Meeting will be held on Saturday, October 11, in Poplar Bluff at the Junior High School Gym located at the junction of Highway 60 and 67. Note that the meeting is being held a bit earlier in the month than usual so be sure to mark your calendars. Also registration will begin an hour earlier at 7:00 a.m. and the meeting itself will begin at 8:00 a.m.

The program for this meeting will feature five speakers and a panel discussion.

Mr. Harry Williams, a State Apiculture Specialist with the University of Tennessee at Knoxville, will address the topic of Bee Disease with two one-hour presentations. The first hour will cover Bee Disease: Laboratory Diagnosis and the second hour will be Bee Management for Disease Control.

Mr. Marvin Parker, who is a Vocational Agriculture Teacher for the U.S. Agency for International Development, will discuss Bee-keeping Practices in Turkey and the Phillipines and share his first-hand knowledge.

Mr. Neal Bergman, a Missouri beekeeper from Kennett, will talk about Queen Rearing.

Dr. Flermoy Jones, entomologist and State Apiculture Specialist from the University of Missouri in Columbia, will present Pollination Contracts and Bee Management.

Mr. Larry Manning, an entomologist with the Missouri Department of Agriculture, will discuss Field Recognition of Bee Diseases and Legal Ramifications.

Mr. Joe Francka, our State Entomologist, will give us an update on the Tracheal Mite situation in Missouri.

The day will end with an hour panel discussion among the Missouri beekeepers on topics of interest.

The complete agenda for the program is found on page of this newsletter. But as you can see it will be a full day with a variety of topics presented by highly qualified individuals. It would be worth your time to make every effort to attend!!!

The Executive Board meeting will be held on Friday evening, October 10, at 6:00 p.m. at Southern Missouri Savings and Loan at Highway 60 Downtown. Note the earlier starting time! All beekeepers are invited to attend this meeting.

NOTICE: EACH AND EVERY LOCAL ASSOCIATION is expected to have at least one representative present at this Executive Board Meeting. Your input is needed.

The suggested motel for the weekend is the Super 8 at Highway 67 North. For reservations, call 1-314-785-0176. Room rates are

| | |
|--------------------|------------------|
| 1 person - 1 bed | \$25.88 plus tax |
| 2 persons - 1 bed | \$28.88 plus tax |
| 2 persons - 2 beds | \$33.88 plus tax |

Children under 18 are free!!!

* * * * *

CONGRATULATIONS to Mr. C. Craig Oliver of the Central Missouri Beekeepers for taking 3rd Place with his Koss Round Comb Honey at the American Beekeeping Federation meeting!!

* * * * *

The following two pages entitled "Bee Information" was written and submitted by Raymond A. Nabors, Area Entomology Specialist with the University of Missouri, Delta Center.

BEE INFORMATION

FALL MANAGEMENT

A. September

1. Check each colony for disease and swarm cells every week.
2. Requeening can be done at this time. Replace the queen in a hive at least every other year. Requeening is best done in the spring.
3. Consolidate frames with empty storage space. Remove frames with capped honey for extraction. Leave at least thirty pounds of honey (one super) on the bees. Do not depend on a fall flow for honey production or starvation prevention. Empty frames should be placed in the center of the super for faster filling.
4. Remove and store clean empty supers under fumigation.

B. October

1. Place entrance reducers in the hives by the end of the month.

DISEASE PREVENTION

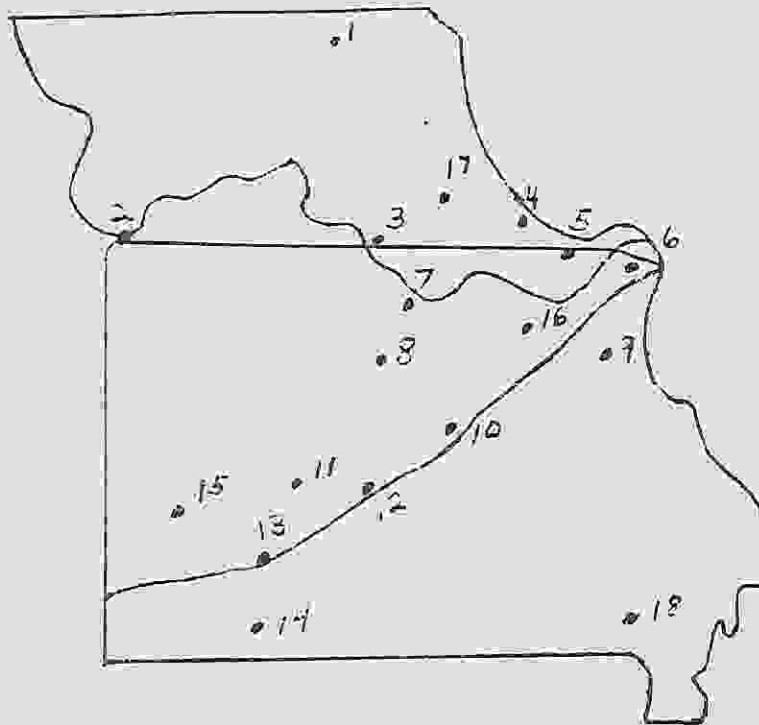
- A. Buy new equipment or have used equipment inspected by the State Department of Agriculture.
- B. Apply Terramycin twice a year (Spring and Fall) before and after the honey flow. This will prevent foul brood diseases. Mix Terramycin powder in powdered sugar (1 part Terramycin to 20 parts powdered sugar) and sprinkle three level tablespoons over the brood frames in each hive. Dust three times at one week intervals.
- C. Nosema disease of adult bees is controlled by Spring and Fall applications of Fumadil "B" (Fumagillin). Add Fumagillin to honey or sugar water when feeding the bees.

- D. Tilt the hive slightly forward to prevent water from accumulating inside the hive. Properly ventilate the hive through the top. Moist conditions inside promote Dysentery as well as other diseases.
- E. Keep a good supply of food on the colony at all times. Most colonies die of starvation during the winter.

WAX MOTH CONTROL

- A. A strong colony with a large population of young housekeeping bees is the best defense against wax moth.
- B. All supers and hive bodies kept off the hive for a week or more must be fumigated with paradichlorobenzene moth crystals (not naphthalene). Stack equipment as on a hive, seal up all air holes and place the stack on a flat surface. A piece of notebook paper placed over the top frames will hold the fumigant. Put a sheet of plastic over the fumigant and then put a flat board or telescoping cover over the entire stack. Seal side cracks between the supers with tape. Two tablespoons of paradichlorobenzene will fumigate eight supers or four hive bodies.
- C. Check the stack periodically for damage and to see if the fumigant has disintegrated.
- D. Always air the fumigated equipment 24 hours before placing it on the bees.
- E. Weak colonies may be dusted with Bacillus thuringiensis (Dipel or Thuricide) over the top of the frames. Weak colonies should be requeened at the first opportunity.

MISSOURI LOCAL BEEKEEPING ASSOCIATIONS



1. NORTH MISSOURI BEEKEEPERS ASSOCIATION (Around Kirksville)
Sec. Ronald Whitacre, Box 33, Glenwood, Mo. 63541
2. MIDWESTERN BEEKEEPERS ASSOCIATION (Kansas City area)
1st VP Walt Bigelow, 110 E. Porte Cima Pas, Kansas City,
Mo. 64114
3. BOONE REGIONAL BEEKEEPERS ASSOCIATION (Columbia area)
Pres. Jim Thaxter, Rt. 4, Box 60E, Moberly, Mo. 65278
4. LINCOLN COUNTY BEEKEEPERS ASSOCIATION (Troy area)
Pres. David Crouch, P.O. Box 125, Troy, Mo. 63379
5. TWO RIVERS BEEKEEPERS ASSOCIATION (St. Charles area)
Pres. Jan Hesse, 2303 Patma, St. Charles, Mo. 63301
6. EASTERN MISSOURI BEEKEEPERS ASSOCIATION (St. Louis area)
Pres. Curt Dennis, 2415 Johnstown, Florissant, Mo. 63033

7. CENTRAL MISSOURI BEEKEEPERS ASSOCIATION (Jefferson City area)
VP John Walther, 3026 Hogan Drive, Jefferson City, Mo. 65101
8. HONEY PRODUCERS OF MID-MO (Around Eldon and Olean area)
Sec. Phyllis Bond, Rt. 1, Box 46, Olean, Mo. 65064
9. JEFFERSON COUNTY BEEKEEPERS ASSOCIATION (Hillsboro area)
Pres. James Bieg, P.O. Box 51, Hillsboro, Mo. 63050
10. MID-MISSOURI BEEKEEPERS ASSOCIATION (Rolla area)
Pres. Lawrence Snelson, HCR 35, Box 432, Rolla, Mo. 65401
11. DALLAS COUNTY BEEKEEPERS ASSOCIATION (Buffalo area)
Pres. Fred Clayton, Box 54, Buffalo, Mo. 65622
12. LACLEDE COUNTY BEEKEEPERS ASSOCIATION (Lebanon area)
Sec. Liz Gregory, Rt. 3, Box 45, Plato, Mo. 65552
13. OZARK BEEKEEPERS ASSOCIATION (Springfield area)
Pres. Dan Kelly, Rt. 6, Box 610-I, Springfield, Mo. 65803
14. OZARK MOUNTAIN BEEKEEPERS ASSOCIATION (Branson area)
Sec. Walter Hess, Star Rt. 4, Box 2173, Branson, Mo. 65616
15. PRAIRIE COUNTRY BEEKEEPERS ASSOCIATION (Lamar area)
Sec. Virginia Hininger, Rt. 2, Box 56, Lamar, Mo. 64759
16. MISSOURI VALLEY BEEKEEPERS ASSOCIATION (Washington area)
Sec. Bill Kohne, Rt. 2, Box 43, Sullivan, Mo. 63080
17. LITTLE DIXIE BEEKEEPERS ASSOCIATION (Mexico area)
Pres. Dom Collop, Rt. 2, Mexico, Mo. 65265
18. SEMO HONEY PRODUCERS ASSOCIATION (Poplar Bluff area)
Pres. Glen Thornton, Rt. 6, Box 270-U, Poplar Bluff, Mo. 63901

The following article is taken from the July-August 1986 issue of the "Kentucky Bee Line".

A LITTLE BIT CAN MEAN A WHOLE LOT

I bought a jar of honey from a supermarket shelf in April 1980 and sent it off to be tested. It came back as grossly adulterated. The local Franklin County Beekeepers were concerned. We filed a complaint with the Pure Foods Branch of the State Health Services. This was added to a lot of other complaints. There were more investigations by the State and belatedly by the Federal Food and Drug Administration. They learned what a big problem the marketing of adulterated honey was at that time. It is less so now but may be ever present. For these reasons the following communique, which Bill Eaton sent over, is very interesting to me.

"Oliver Anthony of Philadelphia, Miss., who in 1984 pleaded guilty to shipping fake honey and maple syrup throughout the United States, was sentenced last month to three years in prison for failing to meet the conditions of his probation.

Anthony and a co-defendant were indicted in 1983 by a federal grand jury on 13 criminal counts of violating the Food, Drug and Cosmetic Act by packing and shipping adulterated and misbranded honey and syrup products in interstate commerce. The products were flavored and colored glucose and corn syrup that were labeled and sold at premium prices as honey, sorghum and maple syrup. Anthony and his co-defendant each pleaded guilty in federal court to a reduced number of charges and were fined and sentenced to four years probation.

The co-defendant paid his fine and has since met the terms of probation. However, Anthony paid only \$3,000 of the \$20,000 fine and at the time continued to pack and ship the kinds of products that led to his conviction. When FDA investigators found Anthony's fake products appearing again in interstate commerce, they asked Judge Dan Russell, who imposed the earlier sentence, to revoke Anthony's probation. On May 21 Anthony appeared before Judge Russell and was told to report to the U.S. Marshall on June 20 -- with an extension to July 10 -- to begin serving his three-year prison sentence."

The Editor of the Kentucky Bee Line

* * * * *

The following article is taken from a recent issue of the newsletter by the Minnesota Honey Producers Association.

Canola: A New Illinois Grain Crop?

Farmers in southern Illinois are beginning to plant what is now considered the number one grain crop in Canada: Canola or rapeseed. "Canola" is the name used to describe modern rapeseed varieties originating from the Argentine type (*Bassica napus*) and the Polish type (*Bassica campestris*). The name Canola was registered in 1979 by the Western Canadian Oilseed Crushers Association. The first Canola crop in Manitoba was grown in 1943 on 1,500 acres. By 1979 plantings there reached 1,350,000 acres.

Canadian beekeepers realize an excellent honey crop from Canola. Canola is used in the manufacturing of margarine and shortening and is refined as cooking and salad oil. It has gained wide acceptance as an edible oil used in food products. Canola meal is also becoming popular in animal feed.

One Illinois farmer told me that he is excited about this crop because it ripens ahead of the standard Illinois wheat crop in June and that can mean a two to three-week jump on both weather and double crop (with soybean). Some of the other attractions of Canola are its yield potential and attractive market price. Several varieties are being tried on Southern Illinois farms and reclaimed coal land. If these experimental acreages prove that Canola is a feasible Illinois crop, it could be beneficial to the beekeepers of Southern Illinois.

Honey gathered from Canola is white but granulates rapidly. According to Don Dixon, who is provincial apiarist in the Manitoba Department of Agriculture, the coarse crystals of this honey cause concern to some Canadian honey packers. Much of Canada's honey is packed in cream form and must have small crystals in order to be accepted readily by the consumer.

* * * * *

The following bit of information is taken from the April 1986 issue of The Bee News.

"To prevent snow, water or rain from penetrating the soles of shoes or boots in winter:

This simple and effectual remedy is nothing more than a little beeswax and mutton suet, warmed in a pipkin, until in a liquid state; then rub some of it slightly over the edges of the sole where the stitches are. This will repel the wet and not in the least prevent the blacking from having its usual effect.

From The Family Receipt Book, Pittsburgh 1819

* * * * *

The following article is taken from the American Bee Journal May 1985 and edited by Robert Gibson for the August 1985 The bee News.

CRYSTALLIZATION OF HONEY

Crystallization begins with the formation of dextrose crystals when these crystals separate from the other constituents of honey. This process can be accelerated by the presence of foreign matter such as wax flakes, pollen grains, or dust which can act as templates to hasten crystal formation. It is also possible to speed and control granulation by introducing "seed" crystals. As granulation proceeds, dextrose crystals form networks within the honey and eventually solidify the honey. Dextrose crystals are pure white in color, and their formation causes granulated honey to be lighter in color than when it is in the liquid state.

To maintain honey in its liquid state, careful attention must be paid to the presence of crystals or impurities in the honey, and, if possible, the moisture content of the honey. Honey is a super saturated solution of sugars that readily precipitate from solution and granulate. Accordingly, the less saturated the solution, the less likely granulation is to occur. Thus, the lower the moisture content of a particular honey, the more likely it will granulate. Blending honeys to attain a uniform product that is high in moisture, but within set tolerances (generally below 16.8% water) will help retard the precipitation of sugar crystals and subsequent granulation. The single most important factor in the granulation of honey is the presence of templates or nuclei upon which crystals may form.

TRACHEAL MITES - An Update by John Ambrose

Since the detection of tracheal mites (*Acarapis woodi*) in the United States (Texas) on July 5, 1984, there has been considerable confusion about the mite and its potential impact upon the U.S. beekeeping industry.

Initially, the US Dept. of Agriculture took the position that it was going to try and eradicate this new pest to the U.S. beekeeping industry, and it began a program of destroying known infestations and quarantining infested areas. However, as detection programs were developed in the various states, it soon became apparent that the mite was already widespread soon after its initial detection in Texas. In addition, the difference of opinion among the various spokespersons of the industry (both laymen and scientists) soon made it apparent that no one really knew if the mite would be a problem to the industry. With this background, the USDA soon withdrew from the situation and left it up to the individual states to handle the problem.

To date, tracheal mite findings have been confirmed in at least 22 states and there is a good possibility that other states have mite infestations but not the resources to locate the mites. The reactions of the individual states have varied considerably. Some states such as North Carolina, Virginia and California initiated their own programs to eradicate the mites within their state boundaries and continue those eradication programs as necessary. Other states, most noticeably Florida, have not adopted eradication programs

and have fairly widespread infestations. This is not to say that some control measures are not being undertaken in those states, but complete eradication is not the accepted program.

The different approaches by the various states have had an impact on the interstate shipment of bees (packages, queens, and colonies). Depending on the individual state's regulations, bees may or may not be admitted into that state from a state which is known to have a mite infestation. In addition, a number of states actually try to regulate the movement of bees from mite infested states through their states. Thus, a beekeeper in Florida would have to go through a considerable amount of paperwork and certification procedures before he could ship bees to a northern state, and the paperwork would include many of the states enroute to the final destination.

Perhaps the most serious restriction to the sale and movement of bees is the Canadian reaction to the movement of bees into that country's provinces from the US. At the present time, all movement of bees into the eastern portion of Canada (from Ontario east) from the US is prohibited. There is still permissible movement into western Canada but only from states that are mite-free or those states which have a statewide eradication program in effect. Of course, all of the bees must be certified as being mite free.

Because of the lack of reliable information on the mites, some research work has been initiated by the USDA and several of the states. The USDA labs in Beltsville, MD and in Weslaco, TX are both working with the mite. The Beltsville lab is the primary confirmation center for mite detection and is also doing some work on obtaining registration for chemical treatment of mites. Dr. Wilson in Weslaco, TX, is studying the impact of the mite on the bee industry and a similar study is underway in Mexico.

A number of the states have begun some mite research and Florida has probably been the most active as demonstrated by the publication of various research articles. Of course, one of the real problems with mite research is that the results obtained in one area of the country may not apply in another area because of differences in climate and other factors.

North Carolina has also initiated a mite study to examine the spread of the mites within colonies and between colonies. The project also includes examining the effect of mites on honey production, brood production, bee pollination efficiency and other related factors. This work is being conducted at a remote location on the state's outer banks area where the infested bees can be monitored and kept from spreading to the state's beekeeping industry.

The recent budget reductions by the federal government have had a potentially detrimental effect upon the North Carolina research project in that travel and other supporting funds to maintain the project from NC State University in Raleigh may be severely reduced. If you are interested in seeing this kind of research continued, then you may consider making a tax-deductible donation to the N.C. project. Contributions will be used only for the mite research project and are fully tax-deductible. Donations may be made payable to the "Apiculture Science Fund" and mailed to the Apiculture Office, Box 7626, NC State University, Raleigh, NC 27695-7626.

ACID RAIN AND HONEYBEES

by Mathew Scott

Some months ago, John Thomas asked the question if, "Acid Rain" could be affecting honeybees and nectar flows in Maine? The simple answer to this question is that we do not know. However, a proper response requires some detail and thus the purpose of this article. If nothing more it should prove worthwhile as an educational review of the subject, "Acid Rain".

"Acid Rain" by most scientists in the business correctly call this phenomenon "acid precipitation or acid deposition". This fact has been recognized by these scientists since 1950 and during this recent decade has become a world wide concern. When we speak of acid deposition we have to consider both wet and dry periods. Most of you are very familiar with the wet forms; ice, snow, rain, fog, etc. However, dry deposition in the form of particulates, dust, and aerosols are happening on sunny days. It might surprise you to know that in the U.S. we emit into our atmosphere 24.1 million tons of sulfur dioxide (SO_2) each year and 20 million tons of nitrogen oxides (NO_x) each year. Thus a total deposition of 44.1 million tons go up into the air and returns somewhere on earth in a changed form due to chemical and physical reactions. When SO_2 and NO_x combine with water we find weak solutions of sulfuric and nitric acid being formed.

Since we emit 44.1 million tons of air pollution each year in the continental U.S. then it is a little less than one million tons per state and for Maine that calculates to less than one pound of air pollution per person per year, on the average. However, these emissions are not spread around that evenly and Maine happens to be on the receiving end of the so called exhaust pipe. We are downwind of all the emissions generated in the U.S. due to climate and meteorological factors of the prevailing winds. The air masses move from west to east therefore, the air emissions in the midwest move over 1000 miles toward the East. So, John Thomas is correct being concerned about "Acid Rain". However, I have not yet answered the question. Logic now dictates that we may intuitively think or theorize that "Acid Rain" could affect honeybees.

Let's now talk about some of the facts we know about "Acid Rain" and the environmental impact it has had on ecosystems that have been analyzed. When we talk about acids or bases we should understand pH and what it is. Most of us are gardeners, therefore, we know that soil pH is important to all types of plants. As beekeepers we know also, that honey has an acidic pH value which varies from 3.42 - 6.10 with an average of 3.91, (1). Please keep these pH values in mind as I will be using others to give you a better feeling for the "Acid Rain" phenomenon. Let me now define what pH is. Some call it the potential hydrogen ion concentration of a substance. It has been expressed as: $\text{pH} = -\log (\text{H}^+)$, (2). An understanding of logarithms is necessary for any calculations, however, the pH scale is expressed as follows: a pH of 7 is

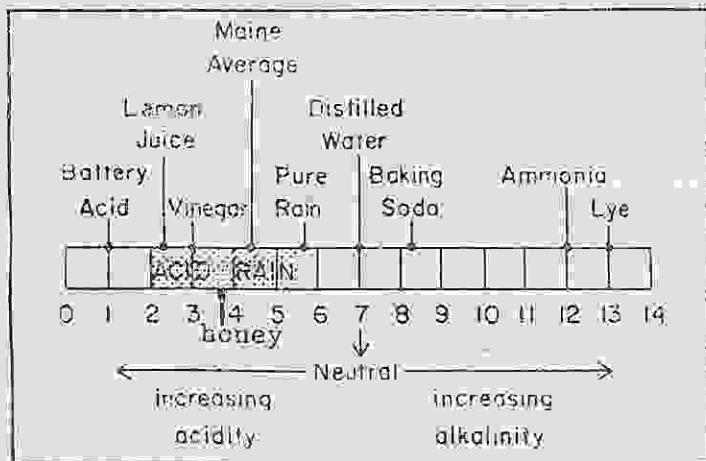
1 2 3 4 5 6 7 8 9 10 11 12 13 14

acid Neutral alkaline

neutral and any value below it is acid and any value above 7 alkaline (basic). As a gardener again, we know that some plants like lime or CaCO_3 which sweetens the soil and makes it neutral or close to neutral pH of 7. Again, many plants vary in pH requirements but that is why we do a soil test before adding lime and fertilizer. So honey on the average is quite acid with a pH of 3.91. Most rainfall not impacted by air pollution is slightly acidic with a pH of 5.6 and any precipitation with a pH below 5.6 is considered to be abnormal. Lake and river pH values in Maine are not normal to support certain fish and other aquatic life when pH values are below 5.0. Lets go back to the pH scale to further explain to you the significance of a change from a pH of 7 to 6. This is a 10 fold change in the acid concentration going from 7 to 6 because the pH is a logarithmic expression and not linear. When you go from 7 to 5 it is a 100 fold change. Remember to multiply each change by a factor of 10. If it were linear like a yardstick it would

simply be additive. In science we often use logarithms to express large numbers. Therefore, I am trying to simplify the mathematics for you so you may appreciate the pH change from 7 to 6 or down to 3.91 which is the average pH of honey. You should now conclude that honey is very acidic. We beekeepers know this and we also know that combined with the low moisture content of honey, less than 18%, no bacteria, yeast or fungi survive. Honey is a very harsh environment or media for growth to occur unless moisture, nutrients, etc. are added.

Again, I have added a pH scale for Maine on "Acid Rain" and have inserted honey along with some other household items you may relate to.



In Maine the average pH of wet deposition (rain, snow, etc.) is 4.3. A few high elevation lakes in Maine have a pH of 4.0 which is considered to be highly acidic where most fish, especially brook trout cannot reproduce. Acid lakes usually contain higher concentrations of metals than non acid lakes. Aluminum is common in Maine soils and bedrock and is dissolved easily at a low pH of 4.0 and 5.0 and as it becomes mobile in water it also is toxic to some aquatic life. As the pH becomes lower the toxicity from aluminum becomes greater. (3). Maine, as yet, has not experienced the same impact to its lakes as New York has in the Adirondack mountains. In addition to strong acids other pollutants are transported in the atmosphere and deposited in areas distant from any known source. Heavy metals such as mercury and selenium and toxic organic compounds such

Also, polynuclear aromatic hydrocarbons (PAH's), are emitted into the atmosphere by fossil fuel combustion and industrial processes and have been detected in "Acid Rain." Just think of the possibilities of how these organic and inorganic compounds may interact with each other in our environment. We understand more of what is taking place in our aquatic systems but little do we understand the aquatic-terrestrial ecosystem linkages. This is why the phenomenon is so complicated because we do not have all the answers.

So how does this all relate to the honeybee and nectar sources? Again, we don't know but it does allow for a great deal of speculation. Most bee forage or plant nectar sources are annuals or trees with deciduous leaves. Many of the trees grow in acid soils while many of the annual clovers require a pH close to 7. A more recent piece of research by Canadian scientists in Quebec show a decline in sugar maple sap production. (4). If indeed a reduction in sugar content and volume of sap produced by sugar maples can be related to "Acid Rain" then we as beekeepers should be concerned about this phenomenon with its continued impact on our total environment. Barry Commenor said that the first law of ecology is that everything in nature is related to everything else. Acid deposition may very well have an effect on nectar sources and yields and therefore is an area where some agricultural research should be directed. I realize that there are other matters of priority with the beekeeping industry concerning mites, honey price support programs, and Africanized bees but I hope that this article better informs the reader about "Acid Rain". In conclusion John Thomas, I have not fully answered your question but it certainly is one I feel needs to be addressed. Hopefully, this article will stimulate some researchers to do some science in this area.

- REFERENCES - (1). ABC and XYZ of Bee Culture by A.I. Root 1978 edition, Median, Ohio.
 (2). Chemistry by M.J. Senko & R.A. Plane 1957 McGraw-Hill Book Co., Inc. N.Y.
 (3). Haines, T.A. 1981 "Acid Rain" The Invisible Threat-Maine Fish & Wildlife Magazine. IF & W Augusta, Maine.

BEEKEEPING QUESTIONS AND ANSWERS

1. What is the correct legal labeling of the quart and pint jars?

The capacity of all honey jars is based on the density of honey under average conditions, e.g., at 18.6% moisture and 68 degrees F., honey weight 11 lbs. 12. oz. per gallon. It is not practical to use other than average value.

In response to numerous questions concerning correct legal labeling of the quart and pint jar, the following information is offered: The Special Wide-Mouth or Regular quart jars (32 fluid oz. in rating) would hold (according to the above formula) one-quarter of the 11 lbs. 12 oz. or exactly 2 lbs. 15 oz. The legal declaration on all quart jars should read: Net Weight 47 ounces (2 lbs. 15 oz.): and the Special Wide-Mouth or Regular pint jars (16 fluid oz. in rating) would hold one-half this amount, or 1 lb. 7½ oz. The legal declaration on all pint jars should read: Net Weight 23½ oz. (1lb. 7½ oz.).

(Taken from "The Kentucky Beekeepers Quarterly".)

2. What are the exact dimensions of a brood box or deep super?

9½ inches deep, 18½ inches long, and 14 5/8 inches wide.

(Taken from The Queen Must Die by William Longgood, pg. 34.)

3. What is the "bee space"?

"Langstroth's masterstroke was the discovery of the "bee space", the amount of clearance left by bees between the combs they build and parts of the hive, usually figured at 5/16 of an inch."

(Taken from The Queen Must Die by William Longgood, p. 36.)

4. What is "drumming the bees"?

"Bees almost always go where their queen is. Their inclination is to move upward. A colony can be induced to migrate upward in its hive by a rhythmic pounding on the sides. This is known as "drumming the bees". The cadence must appeal to some ancient impulse or, possibly, it captures an internal vibration of heart or blood, in the same way that a steady beat is picked up by marching men."

(Taken from The Queen Must Die by William Longgood, p. 43.)

5. How do bees stay or hang in a cluster?

"Bees are marvelously equipped for this unique acrobatic maneuver; each foot is equipped with two tiny hooks that mesh together and stick like burrs, enabling the entire colony to join in the familiar pear-shaped mass. The hooks have to be extremely sturdy for the bees at the top of the cluster to support the weight of those below; a colony of sixty thousand or eighty thousand bees can weight fifteen to twenty pounds. Comparable weight for a man, hanging by knees and trying to support a burden proportionate to his size, would be in the thousands of pounds."
(Taken from The Queen Must Die by William Longgood, pg. 52-53.)

6. Why do bees use the delicate hexagon shape for their honeycomb?

"Mathematicians consider it the most efficient form possible, providing a cask that holds a maximum of honey with a minimum of wax. The walls are so incredibly thin that it would take two thousand to three thousand laid on top of one another to equal a single inch. At the same time, the shape and substance of which it is made have such amazing tensile strength that one pound of beeswax will form thirty-three thousand cells holding twenty-two pounds of honey."
(Taken from The Queen Must Die by William Longgood, pg. 66.)

7. What is burr or brace comb?

"The names are often used interchangeably, but brace comb joins two parts of the hive together, while burr comb is built on comb or on a part of the hive and is not attached to anything else."
(Taken from The Queen Must Die by William Longgood, pg. 68.)

8. What is the size of the cells in foundation?

"Foundation is now standardized to suit worker bees of normal size, providing precisely 4.83 cells to the linear inch, in keeping with the harmonics of the great design."
(Taken from The Queen Must Die by William Longgood, pg. 69.)

9. What is a bee's color range?

"A bee's normal visual color range is blue, yellow, green, and ultraviolet. . . . bees recognize certain flowers by the number of petals and their arrangement."
(Taken from The Queen Must Die by William Longgood, pg. 70.)

MISSOURI STATE BEEKEEPERS FALL MEETING
 POPLAR BLUFF, MISSOURI
 OCTOBER 11, 1986
 JUNIOR HIGH SCHOOL GYM - HIGHWAY 60 AND 67 JUNCTION

A.M.

7:00 - 8:00 Registration

| | | | |
|-------------|------------|---|--|
| 8:00 - 8:30 | Ray Nabors | Entomologist University of Missouri Delta Center | Master of Ceremonies Opening remarks, "Our State Insect" |
|-------------|------------|---|--|

| | | | |
|-------------|----------------|--|---|
| 8:30 - 9:30 | Harry Williams | State Apiculture Specialist University of Tennessee, Knoxville | Bee Disease: Laboratory Diagnosis |
|-------------|----------------|--|---|

| | | | |
|--------------|--------------|--|---------------|
| 9:30 - 10:00 | Neal Bergman | Missouri Bee- keeper, Kennett, Mo. | Queen Rearing |
|--------------|--------------|--|---------------|

10:00-10:30 Break

| | | | |
|-------------|----------------|--|---------------------------------------|
| 10:30-11:30 | Harry Williams | | Bee Management for Disease Control |
|-------------|----------------|--|---------------------------------------|

| | | | |
|-------------|---------------|--|--|
| 11:30-12:00 | Flerney Jones | Entomologist and State Api- culture Special- ist, University of Missouri Columbia | Pollination Contracts and Bee Management |
|-------------|---------------|--|--|

12:00- 1:00 Lunch

P.M.

| | | | |
|-------------|---------------|---|--|
| 1:00 - 2:00 | Marvin Parker | Vocational Agri- culture Teacher, U.S. Agency for International Development | Beekeeping Practices in Turkey and the Phillipines |
|-------------|---------------|---|--|

| | | | |
|-------------|---------------|---|--|
| 2:00 - 2:30 | Larry Hanning | Entomologist State of Missouri Department of Agriculture | Field Recognition of bee Diseases and Legal Ramifica- tions |
|-------------|---------------|---|--|

P.M.

| | | | |
|-------------|------------------|---|-------------------------------|
| 2:30 - 3:00 | Joe Francka | State Entomol- ogist, State of Missouri Dept. of Agri. | Tracheal Mites in Missouri |
| 3:00 - 4:00 | Panel Discussion | Missouri Beekeepers | Moderator- Bernoy Jones |

MISSOURI STATE BEEKEEPERS ASSN.
619 Mendelssohn Drive
Kirkwood, Missouri 63122

ADDRESS CORRECTION REQUESTED

NON PROFIT ORGANIZATION
U.S. POSTAGE PAID
ST. LOUIS, MO.
PERMIT NO. 1152