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EAS JOURNAL

EASTERN APICULTURAL SOCIETY OF NORTH AMERICA, INC.

JULY, 1975

Tentative Program
EASTERN APICULTURAL SOCIETY
August 13, 14, 15 and 16

WEDNESDAY, AUGUST 13, 1975

1:00 p.m.	Registration
3:00-5:00 p.m.	Delegates' Meeting
5:00-6:00 p.m.	Cash Bar
6:00 p.m.	Dinner
7:30 p.m.	Entering of All Exhibits
7:30-9:30 p.m.	Directors' Meeting
7:30 p.m.	Harold Stevens, Weston, Massachusetts; Slide Program, "Nectar and Honey Plants"
8:15 p.m.	Massachusetts Department of Agriculture Film "Partners of the Land"

THURSDAY, AUGUST 14, 1975

7:30 a.m.	Breakfast
9:00 a.m.	Call to Order, President K.G.A. Andersson, Northboro, Massachusetts
	Invocation
	Welcome, Frederic Winthrop, Jr., Massachusetts Commissioner of Agriculture
9:30 a.m.	All Exhibits Should be Entered for Judging
10:15 a.m.	Coffee Break
10:30 a.m.	Fred E. Westbrook, Washington, D.C., Agronomist, Extension Service, "Pollination and the Honeybee"
11:00 a.m.	George E. Cantwell, Beltsville, Maryland, Research Entomologist, U.S.D.A., "Control of Diseases of the Honeybee"
11:30 a.m.	Dr. Chester Cross, East Wareham, Massachusetts, Director, Cranberry Experiment Station, University of Massachusetts.
12:00 noon	Lunch
12:00 noon	Ladies' Luncheon, Bourne Mill, Bourne, Massachusetts
1:15 p.m.	Optional Tours
2:00 p.m.	Professional Apicultural Society
4:00 p.m.	Workshops
	Honey Cookery - Mrs. Bess Clark, Canton, Pennsylvania
	Opening Hives - Jack Matthenius, Phillipsburg, New Jersey
6:30 p.m.	Clambake
8:00 p.m.	Workshops
	Beeswax and Its Uses - Dr. Robert Berthold, Doylestown, Penna.
	Honey Wine - Dr. Dewey Caron, Adelphi, Maryland

FRIDAY, AUGUST 15, 1975

7:30 a.m.	Breakfast
9:00 a.m.	Dr. Henry Hagedorn, Amherst, Massachusetts, Asst. Professor, University of Massachusetts, "Management of the Hive"
9:30 a.m.	Dr. Radclyffe B. Roberts, New Brunswick, New Jersey, Asst. Professor, Rutgers University, "How Honeybees Have Evolved so Complex a Society"
10:00 a.m.	Coffee Break
10:15 a.m.	Eastern Apicultural Society Reports and Annual Business Meeting
12:00 noon	Lunch
1:15 p.m.	Optional Tours

(continued on page 6)

Enzootic Levels of Nosema Disease in The Continental United States (1974)

by E.C. Mussen, B. Furgala, and R.A. Hyser

Numerous investigations have shown that infection with Nosema apis Zander can be detrimental to individual honey bees and to the colonies in which they live. Infection limits digestion of food in the ventriculus and inhibits production of royal jelly in the hypopharyngeal glands of afflicted worker bees. Colonies with infected queens supersede their queens or become queenless. Colonies with infected individuals fail to attain adequate strength by the honey flow, a condition which significantly reduces honey yields. Infected, wintering colonies may develop dysentery and/or not survive to late spring. Brood rearing and population buildup in early spring may be repressed because longevity of infected workers is reduced as much as 50 percent.

The most serious enigma concerning this disease is the fact that the beekeeper seldom sees characteristic symptoms and considers nosema disease a common but minor problem.

The many studies that have been conducted to stress the need for prevention and control of this disease emphasize the economic impact Nosema has on the beekeeping industry. Methods have been developed to decontaminate beekeeping equipment by heat and/or fumigation. Equipment treated in this manner will remain free of infective Nosema organisms only if it is restocked with Nosema-free honey bees. The practical method of obtaining and retaining Nosema-free honey bees and honey bee colonies is the implementation of a program of prophylactic chemotherapy using recommended doses and numbers of treatments of fumagillin. (Fumidil-B®). Proper use of fumagillin chemotherapy has been shown to increase honey yields as much as 30-50 percent.

Taking all of the above facts into consideration, it is surprising that heat treatment, fumigation, and chemotherapy are little used in the United States to prevent and treat nosema disease. Either American beekeepers are under the impression that the disease is not detrimental to honey bees and honey bee colonies, or they are unaware of the fact that their honey bees are, more likely than not, infected with Nosema. This study was conducted to determine the enzootic levels and distribution of nosema disease in the United States.

Materials and Methods

Letters soliciting cooperation in the study were mailed to apicultural coordinators in 43 of the 48 contiguous states. Sample bottles and sampling instructions were sent to those coordinators who expressed a desire to participate. Each coordinator was asked to distribute 30 sample bottles to a representative group of 10 responsible beekeepers in his state.

The general methods used to collect apiary samples and determine quantitative levels of infection have been reported elsewhere. Individual cooperators were encouraged to sample the apiary they selected for three consecutive months, one sample per month. Apiaries in the southern states were generally sampled in March, April, and May; apiaries in the northern states during April, May, and June. All samples, with information tags, were returned to the University of Minnesota where the information on each tag was recorded and levels of infection determined.

The Nosema spore count (in millions of spores per bee) determined for each sample (10 bees) was used as an indication of severity of infection; the percentage of samples with detectable levels of infection (10,000 Nosema spores per bee) was used as an indication of the incidence of disease.

Two approaches were used to summarize and examine the data. The first method arbitrarily divided the country into geographic areas according to latitude and longitude. The second method divided the country into the large geographic districts delineated by the Bureau of the Census, United States Department of Commerce. Each sample was assigned to the appropriate area or district by noting the geographic location of the county in which the sample was taken.

Those apiaries which were sampled on three consecutive months were assigned to one of five classifications based on the severity of infection when initially sampled. Subsequent levels of infection were recorded for each of these apiaries.

Results

A total of 708 samples, representing 376 apiaries in 33 states, were examined to determine

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Detectable levels of Nosema infection were found in 250 (66.5 percent) of the 376 apiaries and 382 (54.0) percent of the 708 samples examined during the study. Detectable levels of infection were found in all participating states, with an average level of infection of 2.53 million spores per bee. The incidence and severity of nosema disease varied with latitude and longitude. A larger percentage of Nosema-containing samples and samples with higher spore counts were collected north of latitude 40 degrees than were collected south of latitude 40 degrees (Table 1a). The incidence and severity of infection in samples taken west of longitude 115 degrees were well above the national average, as were those samples collected east of longitude 95 degrees. Samples submitted from the area of the country between longitude 95 and 115 degrees, however, were considerably below average in frequency and degree of infection (Table 1b).

Certain districts, such as the Pacific, Middle Atlantic, New England, East North Central, and East South Central, were associated with high enzootic levels of Nosema infection, while the Mountain and West South Central districts were unique, with a reduced level and decreased incidence of infection (Table 2).

Time of sampling did not appear to have a significant effect on the levels and incidence of the disease. Although the average Nosema spore count per sample and the average percent samples with detectable levels of Nosema peaked during the April-May period 42 and 48 percent of the apiaries sampled in March and June respectively, had detectable levels of the disease (Table 3).

Sampling apiaries on consecutive months revealed that 61.9 percent of the apiaries which showed no detectable evidence of disease when initially sampled had a demonstrable level of Nosema infection in subsequent samples. Apiaries with initial spore counts between 0.01 and 5.00 million spores per bee had higher average spore counts when sampled on succeeding months and 69.3 percent of these apiaries had detectable levels of infection. Apiaries with initial spore counts above 5.0 million spores per bee had spore counts which were slightly reduced when sampled on subsequent months, but 96.4 percent were found to retain detectable levels of infection.

(continued on page 6)

TABLE 1
The severity and incidence of nosema disease in the United States as a function of latitude and longitude.

	mean spore count (millions of spores/bee)	% infected	No. Samples
a. Latitude			
45 - 50°	4.42	58	53
40 - 45°	3.54	63	313
35 - 40°	1.30	48	206
30 - 35°	1.31	41	136
b. Longitude			
115 - 125°	3.33	53	90
105 - 115°	0.36	26	89
95 - 105°	1.31	42	66
85 - 95°	2.81	59	210
75 - 85°	2.88	62	204
65 - 75°	3.90	67	49

TABLE 2
The severity and incidence of nosema disease in geographic districts of the United States.

Region	mean spore count	% infected	No. samples
New England	4.97	73.0	37
Middle Atlantic	4.73	65.6	48
South Atlantic	1.61	55.0	131
East North Central	3.78	69.6	112
West North Central	2.25	52.4	149
East South Central	3.38	79.0	19
West South Central	0.40	30.0	30
Mountain	0.32	25.0	116
Pacific	4.48	65.2	66

TABLE 3
The severity and incidence of nosema disease as a function of sampling date.

Month	mean spore count	% infected	No. samples
March	1.98	48	159
April	2.72	56	275
May	2.92	59	219
June	1.36	42	55

EASTERN APICULTURAL SOCIETY
General Rules for All Shows

1. All entrants must be registered with the Society and have paid the registration fee regardless of whether or not they attend the Conference.
2. Only one entry may be made in each class by any one family.
3. No identifying labels on any entry.
4. Entries registered Wednesday night 8:00-9:00 p.m. and Thursday morning 8:00-9:30 a.m.

GADGET SHOW

Ribbons will be awarded to the top six winners in each class.

Class 1 - Large devices, (honey extractors, wax rendering equipment, etc.).
Class 2 - Hives or machines (lifters, weighers, etc.).
Class 3 - Small miscellaneous items.
Class 4 - Non-competitive exhibit (no prize).

All entries must be accompanied by a written explanation. This is to be used in scoring by the judges.

Score Points:	Maximum
1. Explanatory text	25 points
2. Practicality	50 points
3. Ease of reproduction	15 points
4. Help to beekeeping	10 points
Total	100 points

BEESWAX SHOW

Prize ribbons will be awarded to the top six winners in each class.

Class 1 - Single piece of pure Beeswax, 1 lb. or more.
Class 2 - Pair of pure Beeswax candles, dipped.
Class 3 - Pair of pure Beeswax candles, molded.
Class 4 - Pair of pure Beeswax candles, fancy.
Class 5 - Novelty candles containing Beeswax (6 assorted).
Class 6 - Novelty Beeswax (additives permitted).

Special rules:

1. All entries in Class 1 should be covered with clear plastic film.
2. All entries in Class 5 must contain some Beeswax. Entries in this class are for colored and novel shaped candles.
3. All entries must be produced by the exhibitor.

Score Points:	Maximum
1. Cleanliness	35 points
2. Color and aroma	30 points
3. Uniformity of appearance	20 points
4. Freedom from crackage and shrinkage	15 points
Total	100 points

HONEY SHOW

Prize ribbons will be awarded to the top six winners in each class.

Class 1* - 3 1 lb. jars Water White Extracted Honey
Class 2* - 3 1 lb. jars Extracted Honey
Class 3* - 3 1 lb. jars Extra Amber Extracted Honey
Class 4* - 3 1 lb. jars Light Amber Honey
Class 5* - 3 1 lb. jars Amber Extracted Honey
Class 6* - 3 1 lb. jars Dark Extracted Honey
Class 7 - 3 sections of Light Comb Honey
Class 8 - 3 sections of Dark Comb Honey
Class 9 - 3 sections of Cut Comb Honey
Class 10 - 3 jars Finely Granulated Honey (16 oz. jars)
Class 11 - 3 jars Chunk Honey (1 lb.)
Class 12 - Cut Comb Frame of Honey (no wires)
Class 13 - Shallow Extracting Frame of Honey
Class 14 - Full Depth Extracting Frame of Honey
Class 15 - 3 Novel Shaped Containers filled with Honey (3 identical shaped containers)
Class 16 - Novelty Gift Box filled with Honey
Class 17 - Shadow Box or Niche Display of Honey or other

*Queen Line Glass Jars in Classes 1-6.

Special Rules:
1. All jars must
2. Frames must and have gla
3. Section coml
4. Color will be
5. All entries m 74-August 75

Score Points:
1. Density (wate
2. Freedom from
3. Cleanliness -
   a. Lint (7)
   b. Dirt (10)
   c. Wax (7)
   d. Foam (6) .
4. Flavor
   Absence of, of
5. Container app
   Cleanliness an

Class 1 - Mead
Class 2 - Mead
Class 3 - Mead
Class 4 - Mead

Score Points:
1. Clarity . . . . .
2. Color . . . . . .
3. Taste . . . . . .
4. Body . . . . . .
5. Bouquet . . . .
6. Bottle . . . . .
7. Bottle Closure

Class 1 - Cookies
Class 2 - Cookies
Class 3 - Bars or
Class 4A - Cake, u
Class 4B - Cake, fr
Class 5 - Yeast B
Class 6 - Yeast B
Class 7 - Yeast R
Class 8 - Quick B
Class 9 - Muffins
Class 10 - Candy .
Class 11 - Pie (rule

Special Rules:
1. Entries must be a
2. At least 25% of tl
3. No "mix", or prep
4. Entries will be ex
5. Pie crust judged

Score Points:
A. Baked Goods
   1. General Appear
   2. Flavor . . . . .

GENERAL RULES FOR ALL SHOWS-- (continued from page 5)

3. Texture, grain, moisture, uniformity of color	30 points
4. Lightness	15 points
Total	100 points

B. Candy

1. Attractive appearance	20 points
2. Flavor	35 points
3. Texture	25 points
4. Handling quality in serving	20 points
Total	100 points

SWEEPSTAKES AND BOWL PRIZES will be awarded to the entrants with the greatest total number of points (points; Firsts - 10 Seconds - 6, Thirds - 4, Fourths - 3, Fifth - 2, Sixths - 1.

Enzootic Levels of Nosema Disease--

(continued from page 3)

Discussion

This paper presents the results of the first nation-wide Nosema survey conducted since the early 1920's. These results indicated that nosema disease is present in most of the apiaries in some states and in nearly 2/3 of the apiaries throughout the country. This current incidence of infection is a considerable increase over the 20-22 percent reported in the 1920's. The fact that levels of infection exceed 2 million spores per bee in much of the country during a period when colonies should be expanding the brood nest and increasing the adult population must not be ignored. As indicated earlier, infection with Nosema disables individual honey bees and honey bee colonies, which means weaker colonies with fewer bees and queens for the package and queen producers; weaker colonies for pollination; and less honey for the honey producers. These are real but avoidable economic losses to the beekeeping industry.

With Nosema so widespread, it was surprising that only 32 samples (4.5 percent) were taken from apiaries treated with fumagillin, many of them treated after the results of the initial sampling were communicated to the coordinators. More disturbing was the fact that some beekeepers who were using fumagillin were not following the recommendations and directions supplied with the Fumidil-B® , and, therefore, not protecting their bees from the effects of the disease.

To provide adequate protection with fumagillin chemotherapy, it is essential that a sufficient quantity of properly medicated sugar syrup be manipulated by the bees, distributed, and stored with the food reserves. Fumidil-B® is used most efficiently when it is fed in 2:1 sugar syrup to wintering colonies in the fall; in 1:1 sugar syrup when installing packages. A minimum of two gallons of medicated syrup, containing the recommended doses of one teaspoon Fumidil-B® (approximately 100 mg fumagillin activity) per gallon, should be fed to each colony to be wintered. A minimum of one gallon of medicated syrup is recommended for package colonies.

In northern or coastal areas where cold, wet weather confines bees for prolonged periods during late winter and early spring, three gallons of medicated syrup may be required for wintering colonies. Packages may require a second feeding of medicated syrup about two weeks after installation. Recommendations for the proper use of Fumidil-B® in southern areas have been published recently.

Everyone associated with the beekeeping industry should be aware that Nosema is not a condition which is found only in isolated regions; it is a disease which is present throughout the nation. At a time when costs are soaring, beekeepers can ill afford the insidious but continuous economic damages caused by this disease. Efforts must be made to provide beekeepers with a diagnostic service whereby preventive and control measures may be implemented when necessary. If such a service is not feasible, the results of this study appear to indicate that preventive chemotherapeutic measures may be warranted as a routine management practice.

Tentative Program--

(continued from page 1)

2:00 p.m.	Workshop
6:30 p.m.	Banquet and Awards - Speaker, Dr. Thom Fisher, Entomologist, University of New Hampshire
9:00 p.m.	200 Years of Beekeeping

SATURDAY, AUGUST 16, 1975

7:30 a.m.	Breakfast
9:00 a.m.	Francis O. Holmes, Henniker, New Hampshire, "Nectar Sources of New Hampshire"
9:30 a.m.	Graduate Student, Cornell, New York
10:00 a.m.	Coffee Break
10:15 a.m.	P. W. Burke, Associate Professor, University of Guelph, Guelph, Ontario, Canada
11:15 a.m.	Alphonse Avitabile, Waterbury, Connecticut, Associate Professor of Biology, University of Connecticut, Waterbury Branch, "Drones, Swarms and Bee Trees"
12:00 noon	Lunch

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An additional charge
Board of Directors.

James I. Hambleton Award

One of the highlights of the Eastern Apicultural Society meeting this year in Bourne, Massachusetts, will be the presentation of the James I. Hambleton Award. This years recipient will be Dr. Basil Frugala of the University of Minnesota.

Dr. Frugala is a graduate of Isaac Newton High School in Winnipeg, Manitoba, Canada. He received both his Bachelor of Science and his Master of Science degrees from the University of Manitoba in Canada and earned his PhD. from the University of Minnesota.

He is currently employed by the Department of Entomology, Fish and Wildlife, University of Minnesota, in St. Paul.

Dr. Furgala is scheduled to present a paper at this years E.A.S. meeting in August.

1975 E.A.S. MEETING SCHEDULE
August 13, 14, 15, 16
Massachusetts Maratime Academy, Bourne, Massachusetts.
1976
Virginia Polytechnic Institute, Virginia
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Delaware University, Newark, Delaware.

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