

# APIS



## Apicultural Information and Issues

From IFAS/University of Florida  
Department of Entomology and Nematology

September 1999

### Inside APIS:

#### **Apimondia in Canada**

Beekeeping at the dawn of the new millennium. *Page 1.*

#### **Varroa Mite:**

#### **A 5-Species Complex?**

Will the real *Varroa jacobsoni* please stand up? *Page 2.*

#### **Varroa: 12-Year Review**

Beekeeping prospects after more than a decade of Varroosis. *Page 3.*

#### **Bee Nutrition**

New technology may begin to tell us more. *Page 3.*

#### **October Meetings**

Mark your calendar for Honey Bee Technical Council, Africanized Honey Bee Task Force and Florida State Beekeepers. *Pages 3 and 4.*

#### **Florida's Bee Inspection on the World Wide Web**

The premier US bee inspection program has a home page. *Page 4.*

APIS Volume 17, Number 9

ISSN 0889-3764

Copyright© M.T. Sanford "All Rights Reserved"

## Apimondia in Canada

APIMONDIA '99 IS HISTORY. Too much cannot be said about this Canadian-organized event in Vancouver with the theme: Beekeeping in the New Millennium. It was well orchestrated and chock-full of a wide range of information. The Apexpo featured booths from all continents. The only complaint was that much of the information presented was available only in English. Several symposia were often being presented simultaneously with a plenary session. Only the latter was equipped with translators. Apimondia officials are going to have to come to grips with this issue at subsequent events, as there are sure to be increasing numbers of symposia required to address the full array of beekeeping topics projected for future congresses.

**A**PIMONDIA stands for the International Federation of Beekeepers' Associations. This organization was created in 1949 as an offshoot of the Secretariat of International Apicultural Congresses, first organized in Brussels in 1897. Apimondia has sponsored beekeeping conventions on all continents except Africa. This will be remedied two years hence when the congress convenes in Durban, Republic of South Africa. To receive advance publicity, send a request to: The Secretariat, Conference Planners, PO Box 82, Irene, 0062 South Africa, fax +27(0)126673680. Apimondia is European in origin, but congresses held in other countries reveal that the organization is taking on a more important role in the global village. It has developed specialized relationships with the Food and Agriculture Organization of the United Nations (FAO) and other groups, mounted a specialized Web site on apicultural issues and information<sup>1</sup>, and is the authoritative reference for international definitions of food standards (Codex Alimentarius) now under review<sup>2</sup>. The organization has also entered into an agreement to set up a reference center for free exchange of beekeeping magazines (University of Udine, Italy) and to boost collaboration with the American Apitherapy Society (AAS) in researching use of bees and bee products for human health<sup>3</sup>.

This newsletter cannot hope to report on the full conference, but I will attempt to give a flavor of the event here along with some highlights. Other reactions are cataloged on the Bee-L Internet discussion list, which now has a searchable index<sup>4</sup>. The congress was built around Apimondia's seven standing commissions: beekeeping economy, bee biology, bee pathology, melliferous flora and pollination, technology and equipment, apitherapy, and rural development. Each day featured a plenary session with simultaneous translation in the morning and afternoon. Titles included *Continued next page*

<sup>1</sup> [http://www.beekeeping.com/apimondia/index\\_us.htm](http://www.beekeeping.com/apimondia/index_us.htm)

<sup>2</sup> [http://www.beekeeping.com/articles/honey\\_quality.htm](http://www.beekeeping.com/articles/honey_quality.htm)

<sup>3</sup> <http://bee.airoot.com/beeeculture/digital/1999/column14.htm>

<sup>4</sup> <http://listserv.albany.edu/archives/bee-l.html>

# Varroa Mites: A 5-Species Complex?

GIVEN ALL THE GOINGS ON, it is difficult to select any one presentation that could be considered a trendsetter at Apimondia '99. However, a paper by Dr. Denis Anderson, Research School of Biological Sciences, Australian National University, Canberra<sup>5</sup> comes close. His presentation was entitled, "Are There Different Species of *Varroa jacobsoni*? (Proceedings of the 36th Apimondia Apicultural Congress, Vancouver, Canada, pp. 59–62, September 1999). The conclusions hint that there may be an explosion of new knowledge surrounding honey bees and related organisms in the next century through DNA analysis.

Dr. Anderson provocatively suggests that *Varroa jacobsoni*, first discovered on the island of Java, may not in fact be the cause of all the problems that have been attributed to this organism. First evidence came from size discrepancies between mites on the original host (*Apis cerana*) and those found on *Apis mellifera*. Then it was discovered that *V. jacobsoni* found on Java could not reproduce on *Apis mellifera* brood. Studies in Brazil also revealed low mite fertility<sup>6</sup>. Finally, DNA analysis corroborated differences between *Varroa* on Java and mites parasitizing honey bees in Europe.

Subsequent studies by Dr. Anderson from 1996 to 1998 reported at Apimondia '99 compared mitochondrial DNA

(MTDNA) of *Varroa jacobsoni* on Java, parasitizing the original host (*Apis cerana*), with other species of Asiatic *Varroa* (*V. underwoodi* and *V. rinderei*) and other mites. This was then compared to MTDNA of reproducing mites found on *Apis mellifera* in 32 different countries. Other studies, Dr. Anderson contends, provided evidence that reproductive isolation occurs in the same geographic locality between mites parasitizing *Apis cerana* and those reproducing on *Apis mellifera*. Thus, only one mite species appears to exist in any one country or island, with the exception of the island of Luzon in the Philippines, which has two. The species are distinct enough, according to Dr. Anderson, that they can be divided into two broad kinds, called haplotypes.

The Korean haplotype is the most common worldwide, found in Africa, Europe, the Middle East, Asia and the Americas. It is also the damaging mite that all of us have come to call Varroa. The Japan–Thailand haplotype is less common, confirmed in Japan, Thailand and the Americas. This benign cousin (the original *Varroa jacobsoni*) does not reproduce on *Apis mellifera*. Could this be a reason why honey bees in Brazil and parts of Mexico tolerate Varroa without chemical treatment?<sup>7</sup> Dr. Anderson concludes that *Varroa* is really represented around the world by five separate species. Only one has spread

## Apimondia continued

advances in bee products, new directions in mite management, risks of world-wide bee movement, innovations in beekeeping, rural development, the scientific basis for apitherapy, and commercial pollination. In addition, there were a large number of symposia in English only, including titles such as beekeeping education in the 21st century, mead and beer production, races and genetics of bees, supplemental feeding and nutrition, regulation and inspec-

tion, integrated pest management, selective breeding and stock maintenance, and American foulbrood management. Sessions on beekeeping editors speaking to their readers and using stingless bees in the Americas were new to the congress, but reflective of how the number of topics continues to expand. If this wasn't enough, the event also included the American Bee Research Conference, sponsored by the American Association of Professional Apiculturists (AAPA). ■

“

*Varroa jacobsoni* may not in fact be the cause of all the problems that have been attributed to it.

”

from *Apis cerana* to become a serious parasite of *Apis mellifera*. This mite is **not** *Varroa jacobsoni* as described from Java, he says, and must be renamed, along with three new species found in the Philippine islands.

What this research means for the beekeeping community is not clear. If the *Varroa* now parasitizing *Apis mellifera* in much of the world with such tragic results is indeed renamed, this could make a good deal of scientific literature on this particular organism instantly out of date. Renaming the beast, however, will mean little to those most plagued by its depredations at the present time. It remains for applied research to take the next step and use this new information to help beekeepers better understand and control this pest in the future. ■

## Varroa: 12-Year Review

IT SEEMS LIKE ONLY YESTERDAY that the Varroa mite was detected in Florida as reported in the pages of this newsletter<sup>8</sup>. Dr. Jim Tew of The Ohio State University<sup>9</sup> reviewed the history of the parasite in North America and its effect on beekeeping at Apimondia '99 ("The Effects of Varroosis in North America — A Twelve Year Review," *Proceedings of the 36th Apimondia Apicultural Congress*, Vancouver, Canada, pp. 109–113, September 1999). The mite, according to Dr. Tew, is the biggest catastrophe to befall apiculture since its establishment on the continent in the 1600s. It redesigned nearly 200 years of North American apiculture in the same way the boll weevil restructured the cotton-producing

<sup>5</sup> denisa@ento.csiro.au

<sup>6</sup> <http://www.ifas.ufl.edu/~mts/apishm/apis95/apaug95.htm#T2>

<sup>7</sup> <http://www.ifas.ufl.edu/~mts/apishm/apis97/apmay97.htm#2>

<sup>8</sup> <http://www.ifas.ufl.edu/~mts/apishm/apis87/apoct87.htm#1>

<sup>9</sup> tew.1@osu.edu

<sup>10</sup> <http://www.ifas.ufl.edu/~mts/apishm/apis96/apapr96.htm#1>

<sup>11</sup> <http://www.ifas.ufl.edu/~mts/apishm/apis99/apaug99.htm#3>

<sup>12</sup> scottTA@em.agr.ca

<sup>13</sup> [http://www.leg.state.fl.us/citizen/documents/statutes/1997/ch0586/E161\\_\\_\\_.HTM#0586.161](http://www.leg.state.fl.us/citizen/documents/statutes/1997/ch0586/E161___.HTM#0586.161)

industry in the southern United States. in the 1900s.

Dr. Tew divides the effects of Varroosis (mite depredations) into negative and positive aspects. Overwhelmingly, he says, the scales appear to have been tipped toward the downside, resulting in:

1. A significant reduction in wild or feral honey bees as pollinators.
2. Requiring beekeepers to become pest control operators.
3. Driving many hobbyist and commercial beekeepers out of business.
4. Priority research on mites, which has taken resources from other areas and stunted progress in beekeeping's development.
5. Forcing exploration of other pollination technologies: alternative pollinators, mechanical pollinating devices and genetic modifications avoiding use of pollination vectors.
6. Pronounced loss of variation in the honey bee gene pool.

There have, however, been positive aspects of Varroosis, according to Dr. Tew. These include:

1. The public has become more appreciative of pollination by honey bees.
2. Growers appear more ready to accept honey bee pollination as a legitimate agricultural input.
3. It forced gardeners, growers and ecologists to re-examine their relationship with honey bees.
4. The package bee industry did not die and continues to be healthy, although not in a growth phase.
5. Beekeepers who survived are better practitioners of their craft.

In spite of the terrible ordeal that Varroa has foisted on North American beekeeping, Dr. Tew is surprisingly upbeat about the future of the craft. He concludes that numbers of colonies and beekeepers have stopped declining, and equipment and package/queen bee sales are high. Demand for pollination services are also up, and new mite treatments, including possible tolerance/resistance in honey bees, are on the horizon.

I agree with Dr. Tew that the future seems bright. We are seeing more and more interest in beekeeping and many who have taken up the craft do not have to reconcile in their minds and beekeeping practices

what it was like before Varroa<sup>10</sup>. There is one thing, however, that still might negatively affect the beekeeping industry. This is the population of Africanized honey bees in Texas that could explode upon the scene, which might herald a repeat of the Varroa experience, at least in the southern United

## **Bee Nutrition: What We Don't Know**

FUTURISTS ARE FOND OF SAYING that in the new millennium 90 percent of information will come from outside one's field of study and only 10 percent from within. This may be the case with honey bee nutrition. Research on this topic has been sorely neglected in recent years, perhaps a victim of research shunted aside because more pressing matters (Varroa) required immediate attention. At the Apimondia '99 meeting I was struck by a presentation of Tom Scott<sup>12</sup>, research scientist, poultry, agriculture and Agri-Food Canada, on the advances in nutrition in other domestic animals.

According to Dr. Scott, trends in animal nutrition continue to evolve with the principal emphasis on finding diets that increase production and efficiency of meat, milk and eggs (*Proceedings of the 36th Apimondia Apicultural Congress*, Vancouver, Canada, pp. 120-121, September 1999). Feed accounts for 60 to 70 percent of input costs in animal nutrition, Dr. Scott says. Thus, in Canada a 1 percent improvement in feed efficiency in broiler chickens is estimated to be worth \$10 million Canadian dollars per year in reduced feed costs. Variability in nutrient content of diets, however, specifically that for energy (Apparent Metabolizable Energy; AME, kcal/kg), is high. Broiler chick bioassay, for example, shows 40 to 60 percent differences in AME of wheat compared to barley. Currently, there is no way to predetermine the feeding value of these grains.

A new technology, according to Dr. Scott, has burst onto the scene, which promises to take some of the guesswork out of predicting feeding value. It is Near Infra-Red Spectrometry (NIRS) and measures light absorption by molecular bonds. This tool is now being used by cereal geneticists (to select new cultivars with improved feeding value); feed mills (to produce balanced diets, reducing feed costs

States<sup>11</sup>. Even this, though, might have its positive aspects. As one Brazilian said at a national bee meeting a few years before Varroa was detected, "You should welcome both Varroa and the Africanized bee. They will mean a stronger beekeeping industry in the long run." ■

and excretion of nitrogen and phosphorus via manure); and grain handlers (to determine how much to pay according to feeding value).

This brings us to honey bees. If it works on other grains and foods, there seems little reason to think that NIRS will not do the job on pollen or other materials (soybean flour) fed to bees. Whether this technology might be used effectively in bee nutrition studies is not known at the present time. Meanwhile, I can only remark about the huge amount of information currently available about poultry nutrition as reported by Dr. Scott. More, he concludes, than is known about the feeding value of what we humans routinely consume. ■

### **Honey Bee Technical Council and Africanized Honey Bee Task Force Meetings**

FLORIDA'S HONEY BEE Technical Council is scheduled to meet Friday, October 15, 1999, at the Doyle Conner Building, 191 SW 34th St. in Gainesville, beginning at 10 a.m. This advisory group is looked to by Agriculture Commissioner Bob Crawford for guidance concerning beekeeping rules and regulations<sup>13</sup>. The Florida Department of Agriculture and Consumer Services Division of Plant Industry (DPI) administers Florida's bee inspection program. There has not been a meeting of this body for some time and several things will top the agenda, including small hive beetle and Varroa control, Africanized bees and foulbrood control status. For more information, call 352-372-3505 x114.

The recent discovery of Africanized honey bees in Jacksonville has prompted a meeting of the Africanized Honey Bee Task Force of the Division of Plant Industry. It is also scheduled at the Doyle Conner Building, October 25, 1999, at 10 a.m. ■

## Florida State Beekeepers Meet in Haines City

THE FLORIDA STATE Beekeepers Association is scheduled to meet October 28–30, 1999 at the Florida Leadership Training Center, 5000 Firetower Rd., Haines City, FL 33844, ph 941-439-7332<sup>14</sup>. The president, Mr. Earl Russell, says that a new format will be in store for participants this year. Thursday will feature the always-popular barbecue. Friday will be oriented toward commercial beekeepers, featuring a class all afternoon to obtain a Florida Restricted-Use Pesticide License. This is a unique opportunity, according to Mr. Russell. If methyl bromide is approved for beekeeping use in the state as petitioned, this license will be mandatory in order to apply the material. The test to obtain the license is based on information in two manuals — SM 1: *Applying Pesticides Correctly: A Guide for Pesticide Applicators* (\$7) and SM 53: *Private Applicator Agricultural Pest Control* (\$7). A limited number of copies will be available at the meeting, but it is recommended that those taking the training already be familiar with this information. The manuals are available from IFAS Publications at the University of Florida, P.O. Box 110011, Gainesville, FL 32611, ph 352-392-1764 (for orders over \$10, call toll-free 800-226-1764), fax 352-392-2628<sup>15</sup>.

On Saturday, the business meeting will take place in the morning. A hobbyist beekeeper workshop is scheduled in the after-

noon, featuring honey processing, pest and disease diagnosis and treatment and queen management. Registration fee is \$30 per family. Rooms at the Center cost \$70 per night. Meals are provided ranging from \$7 (breakfast) to \$11 (lunch). The banquet

costs \$20, but the barbecue is free. Registration forms are available from Earl Russell, 1274 Presque Isle Drive, Port Charlotte, FL 33952, ph. 941-743-2302, fax 941-743-9177 or e-mail: erussell@sunline.net. ■

## Florida's Bee Inspection Program on the World Wide Web

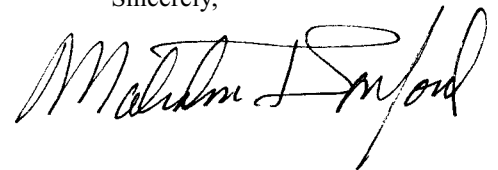
FLORIDA'S BEE INSPECTION program now has its own site on the World Wide Web<sup>16</sup>. This is sure to be appreciated by beekeepers and others around the state who have questions about the service and its policies.

According to the home page: "Apiary Inspection prevents the introduction, dissemination, and establishment of honeybee pests and diseases. This protects the honey industry as well as the valuable pollination services derived from managed honeybee colonies. Apiary inspectors certify honeybees for movement intrastate, interstate, and internationally. Regulated pests and diseases include American foulbrood disease, Varroa mite, and unwanted races of honeybees. Inspectors collect and submit samples to the food lab for certification as Tupelo honey and certify honey for foreign export. There are more than 200,000 honeybee colonies in Florida apiaries. A major concern is the African honeybee (AHB). The Department has the

most active state program in the United States to prevent the accidental introduction of this pest. The Bureau has worked closely with the states involved in the eastern states migratory pattern to develop the Eastern States Agreement on consistent certification requirements. This permits the more orderly movement of bees for pollination and honey production. There is also a cooperative effort with the Apiary Inspectors of America, the American Beekeeping Federation, and the National Association of State Departments of Agriculture (NASDA) to develop national uniform honeybee certification procedures."

Off the home page, there are links to various other resources. A clickable Florida map shows all the inspection districts and provides the name, address and phone number of the appropriate representative<sup>17</sup>. Chapter 586 of Florida Statutes, the "Florida Honey Certification and Honeybee Law," is also available at the site<sup>18</sup>. All beekeepers are required by law to register in Florida. This document should answer any questions or concerns about what many consider the finest beekeeping inspection program in the United States. ■

Sincerely,



<sup>14</sup> <http://www.flaltc.org/>

<sup>15</sup> [http://ems.ifas.ufl.edu/ForSaleResources/forsale\\_98/pestfr.html](http://ems.ifas.ufl.edu/ForSaleResources/forsale_98/pestfr.html)

<sup>16</sup> <http://doacs.state.fl.us/~pi/bees.html>

<sup>17</sup> <http://doacs.state.fl.us/~pi/district-map.html>

<sup>18</sup> <http://www.leg.state.fl.us/citizen/documents/statutes/1997/ch0586/titl0586.htm>

*APIS*, a monthly newsletter, is celebrating its 17th year of service to beekeepers. For subscription or other information, please write, phone, fax or e-mail.

**Malcolm T. Sanford**  
**P.O. Box 110620, Building 970**  
**University of Florida**  
**Gainesville, FL 32611-0620**

Phone: (352) 392-1801, Ext. 143  
Fax: (352) 392-0190  
Internet: [MTS@GNV.IFAS.UFL.EDU](mailto:MTS@GNV.IFAS.UFL.EDU)

Back issues are available on the World Wide Web:

<http://www.ifas.ufl.edu/~mts/apishtm/apis.htm>.

For an electronic subscription, send a subscribe message to:  
[listserv@lists.ufl.edu](mailto:listserv@lists.ufl.edu).

The Cooperative Extension Service, Institute of Food and Agricultural Sciences, is an Equal Employment Opportunity – Affirmative Action Employer authorized to provide research, educational information and other services only to individuals and institutions that function without regard to race, color, sex, or national origin.