

ILLINOIS STATE BEEKEEPERS ASSOCIATION

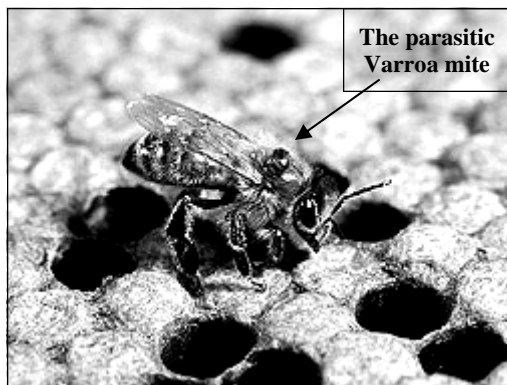
BULLETIN

May/June 2005 • Volume 87, Number 3

Saving Bees: Fungus Found To Attack *Varroa* Mites

Alfredo Flores

Agricultural Research Service Information Staff



Parasites known as *Varroa* mites infest honey bee colonies, sucking blood from the bees and causing weight loss, deformities, diseases, and reduced lifespan. These mites, which can nearly destroy an entire colony within a few months, now infest honey bee colonies across most of North America.

The honey bee is critical to maintaining natural vegetation, transferring pollen between flowers as it collects the pollen and nectar for its hive. And more than 130 agricultural plants in the United States are pollinated by honey bees. Every year, beekeepers send their best bees throughout the country to help pollinate crops, one farm at a time. In 2003, the value they added to U.S. crops was estimated at \$10 billion, not including the honey, beeswax, and royal jelly also produced. USDA's National Agricultural Statistics Service reported more than 2.5 million honey bee colonies-up 1 percent from 2002-and U.S. honey production increased 5 percent, to 181 million pounds.

Since 2000, scientists in the ARS Beneficial Insects Research Unit (BIRU) at Weslaco, Texas, have been looking for a disease-causing agent, or pathogen, that can stop *Varroa* mites. The mite has developed resistance to the only approved chemicals-fluvalinate and coumaphos-now used for control, and coumaphos is on the U.S. Environmental Protection Agency's "hit list" for possible removal from the market. So the researchers have looked at various disease agents,

tried different dosages and application methods, and conducted toxicity tests. Finally, they selected a strain of the fungus *Metarhizium anisopliae* that was highly pathogenic to *Varroa* mites.

This potent fungus, which also kills termites, doesn't harm bees or affect their queen's production. To test it, the scientists coated plastic strips with dry fungal spores and placed them inside the hives. Since bees naturally attack anything entering their hives, they tried to chew up the strips, spreading the spores throughout the colony.

In field trials, once the strips were inside the hives, several bees quickly made contact with the spores. Within 5 to 10 minutes, all the bees in the hive were exposed to the fungus, and most of the mites on them died within 3 to 5 days. The fungus provided excellent control of *Varroa* without impeding colony development or population size.

"We tried to find a pathogen of *Varroa*, and we did it!" says ARS entomologist Walker A. Jones, research leader of the BIRU. Tests showed that *Metarhizium* was as effective as fluvalinate, even 42 days after application. "Commercial beekeepers are very edgy about using fluvalinate and coumaphos and are eager to see this natural control get to market," Jones says.

This research was begun by Rosalind James, formerly with the Weslaco unit. Lambert H.B. Kanga, former BIRU research associate and now chair of the Entomology Department at Florida A&M University at Tallahassee, continues to collaborate on the project. "While *Metarhizium* doesn't kill as fast as fluvalinate and coumaphos, the result is the same," Kanga says. "*Metarhizium* gets the job done, and we won't have to worry about *Varroa* becoming resistant to the fungus."

The scientific team is now fine-tuning the strategy for transfer to producers.β

This research is part of Crop Production, an ARS National Program (#305) described on the World Wide Web at www.nps.ars.usda.gov.

Chemicals in Beeswax

Lloyd Spear

American beekeepers have been using chemicals to control Varroa mites for approximately 15 years. This has invariably led to questions concerning possible contamination of beehive products, specifically honey and beeswax. As I own Ross Rounds, Inc., and also manage around 200 hives, I have learned some basics about how these chemicals have and have not contaminated beehives and the effect of those contaminations.

Fluvalinate (Apistan) was the first of such chemicals. For many years, beekeepers had existed without succumbing to the use of pesticides, unlike most agricultural producers, and I well remember the howls of protest when Apistan was registered. Many beekeepers said they would 'never use a pesticide'. They, and others, quickly learned that failure to kill Varroa with Apistan meant that their hives would die. Not 'might' die, 'would' die. In those early days, our extension agents and university researchers assured us that the level of poison in Apistan was well below the levels that would kill honeybees or larvae, and that they were confident the poison would not find its way into honey.

While the Apistan label required that it not be used while supers were on the hive, the real protection against honey contamination was because the manufacturers had formulated the chemical so it was hydrophobic, or resistant to absorption into a liquid.

Several years after the introduction of Apistan, another chemical was registered for use. This was coumaphous, sold under the name Checkmite. Like Apistan, the Checkmite label prohibited its use while honey supers were on the hive and, like Apistan, the chemical was deliberately formulated to be hydrophobic. However, coumaphous was (and is) a far more potent and long lasting poison than fluvalinate so there were additional requirements concerning withholding honey supers for a stated number of days after the treatment entered and a prohibition against the production of comb honey if coumaphous had been used on the hive!

As the owner of Ross Rounds, Inc., and a major producer of comb honey, that got my attention. Especially as the prohibition was illogical to anyone with knowledge of how bees produce comb honey.

One might say there are three ingredients to comb honey. These are (1) the wax foundation provided as a 'starter', (2) honey collected and produced by the bees, and (3) wax produced by the bees. Numerous and constant testing of comb honey foundation had confirmed that there was

no chemical contamination. Presumably, because comb honey foundation was made solely from cappings wax which, by definition, bees produced while no chemicals were being used on the hives. The honey ingredient should be free of chemical contamination both because it was produced while chemicals were not being used and because the chemicals were formulated to be hydrophobic. In addition, the wax produced by the bees should be free of contamination because the chemicals were not being used at the same time the bees were producing the wax.

Not only was there a lack of logic of how comb honey could be contaminated as long as label instructions were followed, but numerous tests of comb honey produced following Apistan treatment failed to demonstrate any level of contamination.

I wanted to find the underlying cause of this seemingly illogical label restriction.

With little difficulty, I managed to find the person at the Environmental Protection Agency who approved the label wording. When I asked her the reason for the prohibition she said, approximately "Bayer (the manufacturer of the Checkmite strips) wanted the wording." 'We were reluctant to approve the wording as they did not have any tests to indicate that contamination might occur, but finally agreed when Bayer promised to immediately conduct such tests and then revise the label as necessary.'

In addition, she explained, the label restriction was only meant to apply if one used coumaphous in the spring and produced comb honey immediately thereafter. In other words, the label restriction did not apply if a beekeeper used coumaphous in the fall and wished to produce comb honey the following summer. I tried to point out that this was not at all clear, but realized the point was moot until Bayer's tests were complete. Thankfully, Bayer's tests were negative for chemical contamination and that restriction disappeared from the label.

I then lost interest in the subject for several years, although I continued to receive reports of comb honey and cappings wax continuing to test negative for chemical contamination. Then about three years ago, a customer in France asked me to help him locate a US source of beeswax that would be free of coumaphous contamination. He explained that he had been purchasing beeswax from China and that tested positive for both coumaphous and fluvalinate contamination. Some minor level of fluvalinate contamination was acceptable to his customers but they insisted on no coumaphous contamination. As he wanted to buy a container full, about 40 tons, it took some time to find a source. The price was acceptable, and the US producer sent a sample to France for testing.

(Continued on page 3)



Wax foundation contamination is of particular concern to the comb, cut-comb, and chunk honey producers.

(Continued from page 2)

The test results showed contamination with both fluvalinate and coumaphous. Moreover, the level of fluvalinate contamination was almost four times the 'typical' contamination of beeswax in Europe or China and the level of coumaphous contamination was double the rate of beeswax from China. As a beekeeper, I found it difficult to believe that this presumably 'clean' American beeswax was so contaminated. Accordingly, I took samples for the same batch and spent \$200 to send them to a US lab for analysis. The test results were the same as recorded in France.

Astonished, I contacted a person I considered appropriate at the USDA. His reply was approximately "I'm not surprised, so what?" In other words, they knew these levels of contamination were widespread, and they were not concerned.

At about the same time, I began to have great difficulty with my purchased queens. I had long used the same queen producer and was very pleased with his queens. Because I sell nucs and annually requeen, I use several hundred queens a year and began to see an unusual number of drone layers, poor brood patterns, queens that only laid 100 eggs a day, early supercedure, etc. I was not surprised when a queen breeder suggested this might be because of low or damaged sperm. Drones are, after all, produced in cells of 'old' beeswax (unlike queens), and are thus exposed to relatively high levels of 'poison' for a relatively long period. Last year the queen producer announced he would no longer use coumaphous in his hives. I hope that this will reduce the difficulties.

We are finally seeing some end to the need for poisons in our hives. Another formic acid product has just been approved by the EPA (Mite Away II), and progress is being made with strains of bees showing some varroa resistance. Some beekeepers are also reporting success with using oxalic acid and vinegar (acetic acid). Recipes and instructions for using these products can be found on the web, but such use may or may not be legal in your state.

In conclusion, I believe that both extracted and comb honey produced in the United States are today free of chemical contamination, but we may be at the upper limits of the contamination levels our hives can tolerate in their brood nest. β

Lloyd Spear is the owner of Ross Rounds, Inc. His web page is found at www.rossrounds.com. Lloyd's company also produces Sundance Pollen Traps and Sundance custom labels. For those wishing to contact Lloyd directly, his email address is beegood@gmail.com.

Editor's note: Mite-Away II (formic acid) has just been approved for use in Illinois. See Steve Chard's article in this issue. I am not aware that either oxalic acid or acetic acid, both of which were mentioned in this article, are approved for use in Illinois. It would be prudent to check with IDOA prior to using these material in your hives.

A Sweet Read

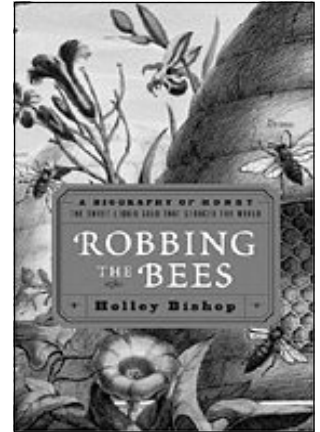
Holley Bishop came to beekeeping later in life—as many of us did. She is a writer and editor in real life, but after making the acquaintance of the bees her fascination with the hive and the honey led her to compose a combination autobiography and biography salted with glimpses into the history of bees and honey. Her new book, *Robbing the Bees*, is subtitled “a biography of honey, the sweet liquid gold that seduced the world.”

After this city girl moved to the countryside she had the urge to experience the farm life. Cows and sheep? She thought deeply about each. Yet after her first experiences with bees she knew that was what she wanted. “That was how my love affair with bees and their magical produce began.” Holley, the novice beekeeper from New York, found a mentor in Donald Smiley, a commercial beekeeper from Florida. The adventure began.

Experienced beekeepers will find her side trips into explaining bee jargon and describing bee equipment superfluous. Yet Holley is a good word crafter. Her description of a queen excluder is nothing like you have encountered before! In *Robbing the Bees* she tells a good story interesting to the beekeeper and non alike.

Thumbs up to Holley Bishop's well-woven story of adventures in beekeeping.β

Larry Kregel



On the Subject of Books

Retired beekeeper Dana Stahlman (www.gobeekeeping.com) has made CD copies of some of the classic books of beekeeping dating from the 1600's, 1700's, and 1800's. They are available at a very reasonable price.

More information is available on his web site or contact him at -



Stahlman Apiaries
3075 Mann Road
Blacklick, Ohio 43004 β

The World's Busiest Airport Pauses... while bees swarm

Adventures in Beekeeping

It was a beautiful warm spring afternoon, the kind of weather that draw swarms from hives and the kind of day on which beekeepers love to have swarms. There it was, a swarm for the taking. Hanging low, out in the open, it was a piece of cake. Yet this is a swarm with a story worth telling.

Bob Cronsell, a member of the Northern Illinois Beekeepers Association with a lot of years of beekeeping under his belt, was at work when word of the swarm came. It was like any other workday for Bob at Gate 9 on the Charlie concourse at O'Hare International Airport (ORD to those whose tickets take them in and out). Bob works for United Airlines doing maintenance on their fleet, but on this day his beekeeping skills were to be his biggest asset to the company.

The alarm came through the network - they had closed down Bravo 6 to Bravo 8. Bees, they said, were on the loose. Bob, feeling the beekeeper urge, headed to the scene on a ramp tractor arriving to find fearful employees keeping their distance and ticket agents and passengers pressed tight to the windows above enjoying the excitement of the sight below. Not even a baggage cart was going to move. Flights were being delayed. Connections were in jeopardy. Not only was the affected aircraft not going to move, but no jet would be brought past the site until the emergency was dealt with. It was costing the company big bucks to just sit and wait.

Bob was at an apicultural disadvantage with no veil or hive box. It actually made the show better for the onlook-

ers. The superhero instinct came out in him. Beekeepers know the awe the general public holds for the swarm-collecting beekeeper, but Bob was about to put on an unusually great performance for an ever-increasing audience.

To the amazement of the crowd Bob—who knew that swarms are generally rather docile—move in close to the swarm that had gathered on the giant tow bar connected to the nose of a tethered jumbo jet. He wore no veil, bee suit or gloves. He came in close assuring himself that they were indeed honeybees and the growing bee beard was approaching the ground below. Two to three pounds, he thought - worth collecting and taking home.

Bob asked for a volunteer to help him. Ya, right! Everybody backed up a step or two. Finally a brave individual agreed to run the hydraulics to raise the tow bar and allow Bob to slip a cardboard box under the cluster and give it a shake. Prestidigitation! He made it look easy. Inviting and ushering the straggler bees into the box Bob slipped it into a large plastic bag. With the swarm under his arm he left to the applause of his fellow employees as well as the passengers who could now continue on their way with an exciting airport tale to tell.

More than the appreciation of those assembled, Bob received yet another reward. The airport swarm made a nice crop of sweet honey that summer. β

Illinois Honey Makes a hit in Europe

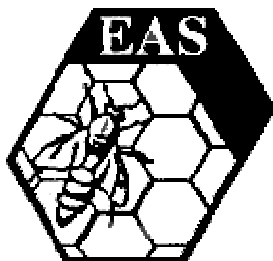
Anton Sever, an Illinois beekeeper from Wooddale has deep roots in Slovenia. When word came of an international honey competition in Semic, back in the old country, he sent off jars of his Illinois sweetness.

He won big—a gold and a silver medal for his bee's efforts. Representing him at the competition and accepting the awards was an official of the American Embassy in Ljubljana, the capital of Slovenia, who then mailed the certificates of award to him.

Nice job, Anton! *B*



EAS 2005



Short Course and Convention

August 1-5

Kent State University

From the EAS web site

The EAS 2005 Committee is getting very excited about the programs that are taking shape. This year's events mix things up a little bit, so pay attention. This year, our chairman has been doing the math, because we've managed to fit a 3 day short course, followed by a 3 day conference into a 5-day week! This year, EAS will be filled with marvelous speakers, excellent workshops, our annual honey show, and a number of tours and excursions.

The short course will open early Monday morning, August 1, and will run until 5 p.m., Wednesday, August 3. The course will be structured to appeal to both beginning and experienced beekeepers. The Short Course is a little different this year, as part of the time the entire group will be together, and then you will be free to break into different sessions, your choice. On Wednesday, the Short Course and Main Conference will be one in the same - Short Course attendees are welcome to stay all day so that they can take advantage of the 50th Anniversary blowout right after lunch, honoring EAS, its history, and our part in it.

The main conference will start at 8:30 a.m. Wednesday, August 3rd (overlapping with the final day of the Short Course), and continue through Friday afternoon, culminating with the Annual Banquet Friday evening. The conference consists of talks and workshops on a multitude of topics. The traditional Welcome Social will be on Wednesday evening. Thursday evening will be highlighted by a Barbecue, and our annual auction.

The schedule for the main conference is now available, as is the workshop schedule. Check the EAS web site www.easternapiculture.org. β

Ireland this Summer?

Need an excuse to go to Ireland this Summer. Consider Apimondia, the 39th International Apicultural Congress, being held in Dublin, Ireland. The Congress will run from Sunday, August 21, to Friday, August 25, 2005. *B*

Céad Míle Fáilte



Fourth Annual Heartland Apicultural Society Convention July 7-9, 2005

*Where? Southern Illinois University at Edwardsville
(just east of St. Lewis)*

Registration? \$40 per person for 3 days or \$15 per day.

*Accommodations? Dorm rooms will be \$25 per night in
a double or \$35 for a single.*

Web site— www.heartlandbees.com

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The “Put Up Plan”

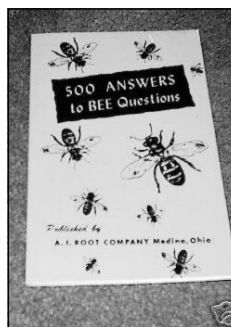
From *500 Answers to Bee Questions*

8th Edition

A. I. Root

Q. What is meant by the “put up plan” for swarming?

A. The “put up plan” is the name used by Dr. Miller to designate a treatment for colonies that swarm. The hive is moved away and a new hive put in its place. The new hive



containing two or three frames of unsealed brood but there must not be any queen cells on these combs. The old hive is then set on top of the new one so that the bees in returning from the field all enter the new hive. This so depletes the old hive of its bees that the colony gives up swarming and the queen cells are destroyed. After about 10 days the old hive is put back in its former position and the new one

taken away for increase. Instead of setting the old hive on top, it can be placed at one side with its entrance turned far enough away so the returning bees will not enter it. Then a few days later, turn back so the entrances are close together before reuniting. When the old hive is set on top, it is placed bottom and all above the cover of the new hive. There being no connection between the two hives, each colony having its own entrance. β

APIARY INSPECTION SUPERVISOR'S REPORT

Steve Chard, Illinois Department of Agriculture

Greetings to everyone. At the time I'm writing this article (late April), I've already received numerous swarm calls, a few from northern Illinois. Things are definitely going forward rapidly this year in apiaries around the state.

We have received notice that Louisiana State University (LSU) and the USDA Agricultural Research Service are jointly conducting a study, which addresses options for controlling varroa mites and tracheal mites. As part of the study, the university is inviting beekeepers around the nation to participate in a survey. Your input is critical to the development of solutions to successfully combat varroa and tracheal mites. The answers to the survey will be kept confidential as well. (More information on page 7)

Formic acid continues to gain a lot of attention as an alternative control for varroa and tracheal mites. We have just learned that the USEPA has granted a Section 3 registration, under the Federal Insecticide, Fungicide and Rodenticide Act, to NOD Apiary Products Ltd. in Canada

The Apiary Industry is now authorized to use Mite-Away II in Illinois.

(www.miteaway.com), for the use of "Mite-Away II" (new formic acid product) in honeybee colonies for varroa and tracheal mite control. Mite-Away II has also just gained registration from the IDOA for use in Illinois. *So, the Apiary Industry is now authorized to use Mite-Away II in Illinois.* A list of distributors is attached where the product can be purchased. While the distributor list includes Dadant & Sons, Inc., at the time of this writing, Dadant hasn't worked out all the details for carrying this product. Feel free to contact them for more information.

This product is toxic and can be very dangerous to beekeepers and bees if not handled properly.

Like all miticide products, be sure to strictly follow all label instructions. This product is toxic and can be very dangerous to beekeepers and bees if not handled properly. If you decide to use this product, please be sure to let your local Apiary Inspector or me know how effective it is for varroa and tracheal mite control.

We have received numerous moving permit requests this year. As you know, moving permits are required

by the Illinois Bees and Apiaries Act whenever bees will be moved from one county to another, from another state into Illinois and from Illinois to another state. Moving bees strictly within a county does not require a permit. Moving permits are based upon an apiary inspection being conducted. Moving permits are necessary for the protection of the Apiary Industry, basically to prevent the spread of disease and pests of the honeybee. Please give your IDOA Apiary Inspector plenty of advance notice when you plan to move colonies. An inspection will be done and the necessary paperwork submitted to me for processing. We turn around the needed paperwork and issue the moving permit rapidly, unless there are major disease or pest problems. Thanks for working with us in a cooperative manner on moving permits.

Please continue to be on the lookout for small hive beetle in your colonies. As you know, this pest can seriously damage your colonies and can easily spread to other colonies in your general area. If you suspect you have the beetle, please contact your respective IDOA Apiary Inspector or me at 217/785-4233. We will promptly collect a beetle sample from your apiary and send to the USDA laboratory in Beltsville, Maryland for needed testing. Your cooperation is very much appreciated concerning this matter.

Finally, I'm pleased to announce that the IDOA has a new Apiary Inspector on board. Ron Abernathy, who resides at Cuba, is now serving primarily the west-central portion of the state. Ron is an experienced beekeeper and has really hit the ground running with inspections. If you wish to contact Ron, his telephone number is 309/224-2765. Ron is anxious to serve you, so please feel free to give him a call! With Ron joining our ranks, we now have a full team of inspectors to serve the State of Illinois. We can now provide needed service to all portions of the state.

As usual, please feel free to contact your local IDOA Apiary Inspector or me if we can be of assistance with your apiary. β

U.S. Distributors of Mite-Away II

B and B Honey Farm
800 342 4811
www.bbhonefarm.com

BetterBee
800 632 3379
www.betterbee.com

Dadant and Sons
888 922 1293
www.dadant.com

Hackenburg Apiaries
505 568 8514

Worcester Honey Farms
610 584 6778

St. Clair Beekeepers Association
hosts
New Beekeeper Short Course

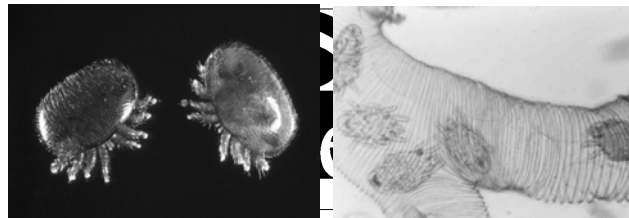
Ken Kloeppe
Vice President
St. Clair Beekeepers Association

On Saturday, February 19th, the St. Clair Beekeepers Association hosted a “New Beekeeper Short Course” on the campus of Southwestern Illinois College in Belleville. The class of 40 “Students” was the largest yet!

Many members of our local beekeeping organization helped out with assisting our “New Beekeepers”, and with giving beekeeping presentations over a wide variety of topics from “Basic Beeology” and “Components of the Hive” to “Enemies of the Honeybee” and much more.

Attendance prizes were awarded throughout the day, and a Grand Prize drawing was held at the end of the day with many great prizes going to our new beekeeping friends.

Upon hearing about our New Beekeeper Short Course, a local newspaper, the Belleville Journal, also ran a full page story entitled, “ So you want to be a Beekeeper ?” in their “Living Here” section. The St. Clair Beekeepers Association would like to thank all of our beekeeping friends who donated prizes for this event. We were fortunate to benefit from the talents of a local photographer at our class. The following photo by Cool Waters Photographic Services, is of our Grand Prize Winners. β



Have you filled out the survey?

Louisiana State University is asking for help in a study they are conducting in cooperation with the USDA Agricultural Research Service. This study focuses on options for controlling *Varroa mites* and *tracheal mites* in the beekeeping industry. Both types of mites pose a serious threat to the future of the American honeybee industry. Among other strategies for dealing with these mites, scientists have been selecting for different traits in bees or lines of bees that are resistant to or less susceptible to both mites. From this survey, they want to determine (1) how much economic damage has been caused by Varroa mites and tracheal mites, (2) how beekeepers are dealing with Varroa mites and tracheal mites, and (3) the economic value to beekeepers of these new lines of honey bees for dealing with Varroa mites and tracheal mites. Interested beekeepers can go to the survey website and complete the survey. The address of the on-line survey is www.honeybeesurvey.com.

Beekeepers with questions, or requests for printed format surveys can write or call.

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Woe to the beekeeper who has not followed the example of his bees by keeping in tune with imperceptibly changing nature, having his equipment at hand the day before it is going to be needed rather than the day after. Bees do not put things off until the season is upon them. They would not survive that season if they did. Nature does not wait.

From Richard Taylor's *The Joys of Beekeeping*

Membership in the Illinois State Beekeepers Association is open to all persons interested in bees and beekeeping. Beekeepers are urged to join through their local associations. Dues for 2005 are \$6 for the calendar year January 1 through December 31 only. Dues include a subscription to this newsletter, the ISBA Bulletin. Beekeeping journals are available at about 25% discount to members as listed below; rates are subject to change without prior notice. Make checks payable to: Illinois State Beekeepers Association and mail to: Rita Taylor, Secretary, 4274 Taylor Homestead Road Pleasant Plains, IL 62677-4024

Please indicate new or renewal subscription when ordering journals.

Address Changes: Send old and new address six weeks prior to date of change when practical to the association secretary.

Reduced Journal Rates for 2004 (*members only*)

	1 yr	2 yr	3 yr
American Bee Journal	17.20	32.75	46.05
Bee Culture	17.00	32.00	N/A
The Speedy Bee	13.25	25.25	34.00

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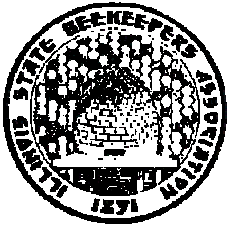
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ILLINOIS STATE BEEKEEPERS ASSOCIATION

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Periodical
U. S. POSTAGE PAID
Permit No 2
Pleasant Plains, IL 62677

- ⇒ *Metarhizium anisopliae*
- ⇒ Chemical residue in beeswax
- ⇒ Bees at ORD
- ⇒ Illinois Honey in Slovenia
- ⇒ *Robbing the Bees*—a new book