



Mar/Apr 2010

<i>ListProc Newsletter</i>	<i>Biochemistry</i>	<i>Quest for Perfect Hive</i>
<i>Honey Candy</i>	<i>Great Sunflower Project</i>	<i>Reporting Bee Losses</i>
<i>2009 Pollin. Survey</i>	<i>Electronic BeeSpace</i>	<i>ELAP Eligibility</i>
<i>Varroa Fumigation</i>	<i>XenBee</i>	<i>Honey Stinger</i> <i>Burning Hives</i>

Newsletter E-mailed to You

The newsletter is published bimonthly, in February, April, June, August, October and December. If you wish to have this newsletter sent directly to your e-mail address, when it is published, please follow the instructions below.

Send an e-mail addressed to **listproc@ucdavis.edu**. Leave the Subject line empty. In the body of your message put in the following: sub ucdavisbeenews <your first name (without these "brackets" around it)> <your last name>. On the next line, insert two hyphens, not underscores (underlines). If I were subscribing, it would be **sub ucdavisbeenews Eric Mussen**

--

The hyphens are there to tell the subscription software on the server not to be confused by any following information that occurs, such as a "signature frame" (or signature block, as I call it).

If you wish to be removed from the list, then you do the same thing, but instead

of **sub**, you use **unsub** or **signoff**, then the name of the list and your first and last names followed on the next line by hyphens.

New, Regional Honey Candy

Since 1898, Gimbal's Fine Candies has been producing steam cooked, high-quality candies in the Bay Area. Currently operating in South San Francisco under the direction of Lance Gimbal, the company produces gourmet jelly beans, Cherry Lovers (heart-shaped, soft centered confections of various cherry flavors), Hot Chewy Cinnamon LavaBalls, Red and Black Licorice Scottie Dogs, original and sugar free Gimbal Chews in various flavors, Raspberry and Blackberry Pectin Drops, Sour Stars and Sour Lips. You may have purchased these under other brand names because Gimbal's produces many items for sale by other companies.

Among other things that set this company apart from the rest is the fact that

they keep their plant free of common allergens that bother candy lovers: their products are free of peanut, tree nut, dairy, egg, gluten, trans fat, gelatin and soy contamination. And it's Kosher.

Recently, Gimbal's decided to venture into a new line of candies. Similar to Cherry Lovers, Gimbal's placed Honey Lovers on the market. These, too, are heart-shaped, firm-shelled, soft-centered candies of many flavors. However, in this case, Gimbal's have integrated as much honey as possible into the soft, inner filling. Honey still comes in behind sugar in the ingredient list, but additional honey interfered with the integrity of the candy. Depending upon the flavor of the piece, the honey taste can be predominant, subtle, or occur only as an after taste, once the candy has been swallowed. When you eat as many as I tend to, the honey taste becomes lost due to its lasting presence in the mouth and throat.

At the UC Davis Picnic Day open house, we gave away 3,600 individually packed samples of the treat. The response was overwhelmingly positive. And, the question was, "Where can we buy these?" They are coming to Walmart, are in Fresh and Easy stores, and their jelly beans already are available at CVS in Davis. Gimbal's products can be ordered on Amazon.com, Candydirect.com, and at gimbalscandy.com. If you wish to contact Gimbal's by phone, the number is (800) 344-6225.

What makes this product especially important to UC Davis is that 5% of the proceeds from selling the product are going to be donated to the UC Davis Bee Biology Program. Although the line just launched in March, Lance Gimbal came to the Davis campus and presented me with an "initial check" for \$10,000.00 to get the ball rolling.

California 2009 Pollination Survey

Once again, the members of the California State Beekeepers' Association were surveyed to get an idea of how things are going in the world of local commercial crop pollination.

The survey form includes the names of the most abundant pollinated crops and asks how many colonies were placed on them and for what price. Then, the data is compiled, analyzed and distributed at the annual CSBA convention in November.

As always, the rental prices of almonds were among the highest. The lowest reported rental fee was \$115 and the highest \$190. The average was \$157.03.

Right up there with almonds were the early blooming cherries, with a low of \$146, a high of \$190, and an average of \$164.55.

Blueberry pollination is becoming lucrative, also. Only two beekeepers reported on that crop, but they had a low of \$140 and a high of \$170, with an average of \$165.

Plums have been able to generate reasonable rates as well. The five beekeepers who reported on plums had a low of \$80 and a high of \$160, with an average of \$140.40.

The rest of the crops generate quite a bit less income per acre and the supply of bees is much more ample as the season progresses. Thus, the prices for renting bees diminish quite a bit. The averages vary around \$30 to \$40, with lows in the \$20s and highs up to \$60.

The total value of honey bee pollinated crops in California for 2008 was listed in the CDFA publication "California Agricultural Commissioners' Data, 2008," as \$6,512,889,100. This represents about one third of the nation's bee-pollinated crops. The beekeepers reported total income of \$223,477,600 that year. The ratio of crop value to the value of the beekeeping industry was about 29 to one. Interestingly, that ratio used to be nearer to 40 to one until the price of almond pollination almost tripled due to colony shortages caused by CCD.

Varroa Fumigants

Obtaining fumigants for varroa mite control may be somewhat difficult at this time for beekeepers. I haven't checked on the Apiguard[®] situation recently, but shipments from Europe had been held up, apparently by U.S. customs. The other desired fumigant, Mite Away II pads, are vanishing from the market quickly. They are out of production and soon will not be available. The reason behind this is because NOD Apiary Products, in Canada, has decided to stop producing the pads and instead offer a formic acid product in strip form. I have not seen the strips, other than in some photos from NOD. They are not like the plastic strips that we used earlier. They are more like thin sheets of formulated product that are laid on the tops of the combs. You can see the photos in the May 2010 issue of the *American Bee Journal* on page 489.

The strips are formed as formic acid impregnated saccharide sheets. The formic acid outgases in about three days. The treatment period will be listed as seven days. By that time the bees will be chewing up the spent strips or the beekeeper can take them out and compost them.

The authors of the ABJ article seem content to conclude from the data set that a 300 gram dose of formic acid kills exposed female mites but also kills male mites while they are under the cappings. This male death precludes the mating of the male with his sisters, so the emerging daughter mites are unable to reproduce. Thus, the mite population decreases when it could have been increasing (see Chart 2 in the article).

Upon hearing about this new, more user-friendly formulation of formic acid, our beekeepers asked, "When can we get it?" At first, it wasn't on the market. Then, production ramped up and it is being used on a special local needs registration in the Hawaiian program that started as a *Varroa* eradication program, but is likely to become a control program.

The special local needs registration is called a 24(c). We quickly learned that a Section 18 on the Mite Away Quick Strips (MAQS) would not be granted. So, the California State Beekeepers' Association submitted an application for a 24(c) in mid-April. My regulatory contacts at the state and federal levels seem to feel that this registration is likely to be obtained. The only caveat to the beekeepers is that not everything blisters through the regulatory process at the speed of light.

It is good that we have attentive ears at both levels of this process, but we have to have some patience, too. NOD Apiary Products is hoping to convert its Mite Away II Section 3 registration over to the new product, using some internal processes, but that likely will not be completed until the fall. We have immediate mite control needs.

Beekeepers and Biochemistry

Don't worry! We aren't trying to convert all beekeepers into biochemists. But, a little bit of biochemistry will be needed to have a better feel for the detailed information that is being generated in the area of pesticide toxicology.

We know that our cells get their energy from biochemical changes occurring in the mitochondria. The same can be said for plants and fungi. Mitochondria are those little sausage-shaped things in the cytoplasm that we see in diagrams of animal cells. The mitochondria have their own DNA and analysis of mitochondrial DNA is used to differentiate between EHBs and AHBs in California.

There is a set of step-wise changes that occur in the energy production process so that a cell can convert fuel, like glucose, proteins, and fats into energy in the form of ATP (adenosine triphosphate).

This process involves a biochemical pathway called the electron transport chain. The chain includes NADH, flavoprotein, coenzyme Q, cytochrome *b*, cytochrome *c*, and cytochrome oxidase.

So, why do we have to read this? Because, many of the pesticides that our bees are encountering work on those biochemical pathways. The insecticides rotenone, pyridaben (Desperado[®]), and tolfenpyrad interfere with NADH dehydrogenase at the beginning of the chain. Hydramethylnon (Amdro[®] and Combat[®]) inhibits the cytochrome b-c complex. Phosphine (Phostoxin[®] or Fumitoxin[®]) inhibits cytochrome oxidase.

Fungicides, such as tolfenpyrad (effective on mildews), Endura[®], Pristine[®],

and Cabrio[®] also interfere with various complexes of the electron transport chain. So, it should not be surprising to find that agrochemicals, besides insecticides, can harm honey bees, especially when the bees consume contaminated pollens while developing as immatures. Despite the fact that the fungicides are labeled as safe for adult bees, if they attack the same biochemical pathways as resident pollen contaminating insecticides, the mixtures can be overwhelming.

This is simply a more detailed look at a specific type of synergism, which was mentioned in the previous newsletter.

The Great Sunflower Project

Begun a few years ago by Professor Gretchen LeBuhn, this project has expanded from its beginnings at San Francisco State University to become a world-wide program. The idea was to have as many people as possible plant Lemon Queen sunflowers and report on whatever pollinators they noted on the blossoms.

As you might imagine, honey bees were only some of the very large number of species of insects that are attracted to the blossoms. Nearly 3,000 greater Bay Area residents are sending in reports. So are around 65,000 other interested folks across the country. The records will contain all the bees observed during a 15-minute time interval during the sunny part of the day (perhaps around 9-10 a.m.). Depending upon the planting schedule, sunflowers can bloom for many weeks during the summer.

The study includes native pollinators, by default. To identify those, some good digital photos would help. Also, the project is expanding to suggest that other

bee-attractive plants be grown, simply to provide food for pollinators that are running short on pollens, in particular, near the end of summer and into the fall. Data currently is not being collected on those flowers.

If you would like to participate, make observations, turn in your records, and take part in the Blog discussions, you can reach the project in at least two ways:

1. Go to www.greatsunflower.org and request a sunflower seed kit.
2. Call (415) 405-2409 to request a seed kit.

If you join the project, there will be an expectation that you will use the Internet to log your data. The project has made that very easy to do with a well-designed Web page. Try it out and see how many bees are around your garden. Interestingly, there are participants who haven't seen bee one all during the bloom.

Electronic BeeSpace

The University of Illinois, Urbana-Champaign campus, has a website that will be of value to nearly anyone who visits, from the general public to cutting edge researchers. Called the Electronic BeeSpace, this site offers eight hours of various video curricula, some of which is quite elementary and some which is very advanced. The more elementary information would be appropriate to project on a screen and use in short courses and workshops.

The multimedia lessons include Bee Biology with Dr. Susan Fahrbach. This is a seven separate segment lecture series that runs a total of 66 minutes and covers honey bee taxonomy, bee biology, beekeeping, pollination, pathogens and colony collapse, venom, and Africanized honey bees.

Obviously, these are relatively brief overviews.

Other lessons, without listed detailed segments are: Nature vs. Nurture with Dr. Gene Robinson; BeeSpace medical implications with Dr. Bruce Schatz; Colony Collapse Disorder with Reed Johnson; Introducing BeeSpace with Nicholas Naeger; Molecular Biology Techniques with Nicholas Naeger; and BeeSpace Molecular Genomics with Nicholas Naeger.

There are a number of "extras" including more videos of experiments, laboratory tours, etc. Included is a planning guide that provides recommendations for planning presentations to different types of school and general public audiences.

To open the door to an "NSF-funded exploration of the genetic basis of the complex honey bee social behaviors, cutting edge molecular biology techniques, experimental design, data collection, data analysis, and extrapolation of findings," visit the following:
<http://www.beespace.uiuc.edu/ebeespace/>.

XenBee

Every so often a new computer application for beekeepers is introduced to the market. This time the program originated in New Zealand. Beekeepers in that country have very strict regulations concerning the "traceability" of their honey. So, this program probably offers more possibilities than many American beekeepers would use, but the rest of the program is valuable to all.

While your server is the hub of this program, their hand-held field unit is pre-programmed to cover practically anything encountered in the field. The program can

be used to assign the job(s) and personnel for each day in the bee yard, record any findings of various types of ill health in one or more colonies, ensure timely removal of treatments to prevent honey contamination, etc.

In the office, the program keeps track of customers, operating costs and expenses, etc. All the desktop entries also can be stored on the server.

For further information about the scope and uses of this program, please visit their Web site at: www.xenacom.com, or call at: +64 7 827 0890. Remember, in California we are five or so (depending on location) hours ahead of their time.

Quest for the Perfect Hive

Increased public awareness of the value and plight of the nation's honey bees apparently has stimulated a number of authors with an interest in honey bees to share their findings with others. Among the newer bee books on the market is a 216 page, 5 ½" by 8 ¼" hardback book titled: *The Quest for the Perfect Hive*.

The text was written by Gene Kritsky, a Professor of Biology at the College of Mount St. Joseph in Cincinnati. He is Editor-in-chief of the *American Entomologist*, the magazine of the Entomological Society of America. The information that I received describes the text as "a concise, beautifully illustrated history of beekeeping, tracing the evolution of hive design from ancient Egypt to the present. Not simply a descriptive account, the book suggests that beekeeping's long history may in fact contain clues to help beekeepers fight the decline in honey bee numbers. Kritsky guides us through the progression from early

mud-based horizontal hives to the ascent of the simple straw skep (the inverted basket which has been in use for more than 1,500 years), from hive design's Golden Age in Victorian England up through the present. He discusses what worked, what did not, and what we have forgotten about past hives that might help counter the menace to beekeeping to-day. Indeed, while we have sequenced the honey bee genome and advanced our know-ledge of the insects themselves, we still keep our bees in hives that have changed little during the past century. If beekeeping is to survive, Kritsky argues, we must start inventing again. "We must find the perfect hive for our times." The text also includes information on patent disputes, glass jar beekeeping, and other historical items of interest.

To order the book in the U.S., go to www.oup.com. Follow the links to U.S., then insert Gene Kritsky in the author block. The basic price of the book is \$24.95. Shipping and handling probably will be \$5.50. Happy and interesting reading.

Reporting Bee Field Losses

Currently there are two ways that information on bee kills or bee colony damage can be submitted to the federal government. The formal method is to use the Ecological Incident Reporting system set up by the National Pesticide Information Center. You can find the paper-less submission form on-line at: <http://pi.ace.orst.edu/erep/>. The form eases you into the process, but eventually requests pretty detailed information, such as the name and dose of the chemical involved, the EPA registration and establishment numbers from the label, etc. This form really is set up to report misuses. Some blanks cannot be left empty or the filing process stops.

However, if you fill in the blanks with words like “unknown,” it keeps going.

A second, much less intimidating approach is that sent to us by Thomas Steeger of the EPA. Tom is a senior biologist and risk assessor, and one of the persons most interested in seeing better protection of pollinators when it comes to registration and use of pesticides around bees.

Tom would like to hear about any of the following, acceptable from beekeepers, bee brokers, or growers.

1. Bee losses from CCD, chemicals, or any other known or unknown reason
2. Poor bees and colony dwindling or failure
3. How weak were the poor colonies?
4. Did you have enough appropriate-sized colonies to meet your pollination contracts?
5. Losses of either bee colonies or potential income due to colony failure, including losses of pollination contracts

You can call Tom at 703-305-5444, but it would be better if you e-mailed the information to Tom (following your call is good) because he can write only so fast during a conversation. Tom is working on a report to be delivered at the national level, and he needs a bunch of testimonial support. You may not feel that you have enough time to contact Tom. However, if you don't share information with Tom, our industry is going to be looked upon as the boy who cried wolf (remember, he had no credibility). We have the attention of some of the right people, currently. Let's not let this opportunity slip away.

ELAP Eligibility

The ELAP program covering losses of honey bees to CCD is still in effect. The program has been modified to cover losses of colonies of even those beekeepers who decided not to try to refill their hives with bees the next season. Payments for those losses will be based on a fair market value of honey bees that were lost. Included in the changes are new deadlines for applying.

Right now FSA is accepting late-filed applications for 2008 and 2009 through May 5, 2010. Currently, there is a self-certification process for beekeepers to report their own losses for the years 2008 and 2009.

CCD losses for 2010 will be covered by ELAP, but independent third-party documentation is required for those losses. Supporting documentation must be submitted before September 31, 2011. So, it sounds like compensation will be delayed for quite a while after the time of the losses and submission of the applications by beekeepers.

Honey Stinger Catches Biker

Honey Stinger is a liquid gel formulation of honey and other ingredients designed to provide quick energy to people performing highly strenuous activities. The gels come in five flavors, with honey as the first listed and main ingredient. The only precaution about eating the gel is that it is not pasteurized and should not be fed to children less than one year of age.

Famed bicycle racer Lance Armstrong met one of the company's founders, Len Zanni, while racing in Colorado. Len had Lance try the product.

Lance was so impressed that this month he became an owner in the company.

If you would like to read more about Honey Stinger's full product line of honey-based energy gels, bars, and organic chews, go to: www.honeystinger.com.

Burning Contaminated Hives

The Central Valley Area Air District is considering adopting regulations concerning burning contaminated beehives. If you wish to review the document, go to:

www.valleyair.org/workshops/postings/2010/04-14-10/DraftReport.pdf. Pages 3-20, section 3.3.3 are bee-related.

Sincerely,

Eric Mussen
Entomology Extension
University of California
Davis, CA 95616
Phone: (530) 752-0472
FAX: (530) 752-1537
E-mail: ecmussen@ucdavis.edu
URL: entomology.ucdavis.edu/faculty/mussen.cfm

Eric Mussen
Entomology
University of California
Davis, CA 95616