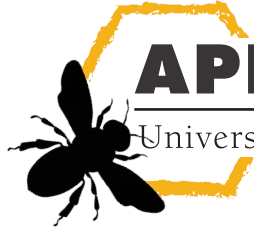


NEWSLETTER

APICULTURE

University of California, Davis

MARCH 2016



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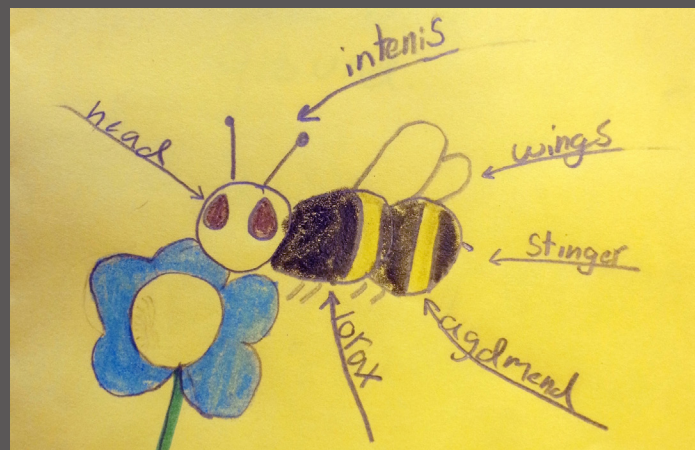
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NEWSLETTER EMAILED TO YOU

To subscribe a new email address to our quarterly newsletter go [here](#), enter your email address and click on submit. Remember, if you have previously signed up for the newsletter you do not need to subscribe again. Hard copy of the newsletter will no longer be available except to those who have prepaid and the last hard copy will be sent in June 2017. You can also read our newsletter [here](#).



A rendition of a bee by one of our young Bee Haven visitors.

SUPPORT THE BEE HAVEN

Where will tomorrow's bee researchers first learn about the wonders of bees? How can our communities learn about the importance of bee pollinators to healthy, affordable food? Who will inform our future voters and policy makers about the dependence of our food supply on an abundance of healthy pollinators? Well, we here at the Häagen-Dazs Honey Bee Haven can help! Did you know that California is home to the country's only public bee

To stay up-to-date on the most current news from the E. L. Niño Bee Lab visit our [Facebook page](#).

garden that's managed and maintained by bee biologists and open to the public every day, free of charge? In fact, just in 2015 we've had over 4500 visitors and outreach participants. The Haven is a unique outdoor experience located on Bee Biology Road near the UC Davis Harry H. Laidlaw Jr. Honey Bee Research Facility (or Bee Bio as we like to call it) where visitors learn about bees and the plants that support them. We love sharing our passion for bees. So come on over and meet one of the 85 bee species that have been spotted in the garden.

For families, we provide a unique environment where kids can safely catch and observe bees and other visiting pollinators, including a few resident hummingbirds. In addition to guided tours, we conduct regular outreach events that feature many activities and demonstrations including an observation hive, beekeeping demonstrations, and honey tasting. We are currently developing a Pollinator Education Program for our youngest explorers that features several fun-filled and activity-packed pollinator stations. This particular program is suited for children grades 3-5 but we are also working on developing programs for kids of all ages. And as much as we would love to have all of you visit us we know that this is not possible so we are developing "teach-the-teacher" programs where teachers from California schools can come and be trained in basic bee and pollination biology. They will also learn how to grow a bee-friendly garden so they can take that knowledge back to their schools and create their own pollinator programs and pollinator-friendly gardens.

For gardeners, we provide information about how to choose and grow bee-supporting plants and other steps we can all take to help bees. Our bee scientists continually evaluate the garden's plants so we know we are recommending the best bee forage. Recently we conducted an "Advanced Bee Gardening" course and will soon be offering an intensive bee-friendly plant course. As a part of a large, multi-state project we will also be evaluating various plants and cultivars for their attractiveness to pollinators, as well as risk assessment for bees of ornamental plants treated with pesticides. We will also be working on developing Integrated Pest Management programs for gardens that will best support pollinator presence and health.

Please visit our [webpage](#) to learn more about all that our garden has to offer.

CALIFORNIA MASTER BEEKEEPER PROGRAM

You heard us talking about it and now it's finally happening! We are excited to start accepting your applications for the **Apprentice Level** this month with the submission deadline of **June 1, 2016**. **Bernardo Niño** will be emailing the program description and the applications via the **CAMBP** listserve. If you would like to be added please send an email to sympa@ucdavis.edu from the address you want to subscribe to the list and in the subject line of your message type in: **subscribe camasterbee YourFirstname YourLastname**. Our first testing for the **Master Beekeeper Program Apprentice Level** will take place in **September, 2016**. The test will consist of both a written and a hands-on component. We are extremely excited to embark on this journey with you! Your **CAMBP** team.

Now that you've heard about all the wonderful things we do, we want to ask for your support. While our amazing volunteers and donors help us keep costs down, successful garden maintenance requires about \$10,000 per year for plants, irrigation, tools, and other needs. We have submitted several proposals in hopes to provide support for our wonderful staff, but as you may know this does not guarantee the funding.

This is why we ask you to please consider helping us with a **donation**. All of the money will help us keep the garden buzzing with excitement. Thank you for all your wonderful support throughout the years and come and visit us at the garden as we would love to show you around!

Christine Casey (garden manager) and Elina L. Niño (garden director)



Our future beekeepers! Students from a CA Home School enjoying the Bee Haven and learning about bees and pollination. March 2016.

COLONY LOSSES 2015-2016

While I don't have any official numbers or averages for California I can tell you that I've been receiving phone calls and emails from many beekeepers who all say they had losses much higher than usual or higher than what they were expecting to see. In fact, some have reported losses double or greater of what they've been seeing in the past. Joe Traynor mentions that "There were spot shortages of almond bees with isolated reports of growers paying \$200 per colony for 3 and 4-frame colonies." That wasn't an easy thing to read or think about. As many growers and beekeepers depend on their businesses to put the food on their table and we depend on them to put the food on our tables, this indeed is quite troubling.

So what's been going on? In my conversations with beekeepers I kept hearing that the colonies were doing well earlier in the season and varroa mites were seemingly low. And then all of a sudden August came along and the mite numbers were out of control and the colonies started dwindling. My first two questions are always: How have you been managing your varroa? and Do your bees have plenty of food? I'm still surprised at the number of people who say that A) it "seemed" like the bees didn't have a lot of mites, and B) Oh, I didn't know I should be feeding the bees.

I urge you to monitor the varroa mite levels pretty regularly (at least once a month) and treat accordingly and of course take preventative measures to reduce those mite numbers before they ever get a chance to take off (e.g., hygienic bee stock, brood in break cycle, drone comb removal, etc). You can find some very useful *Varroa* management information in the relatively

new “**Tools for *Varroa* management**” publication by the Honey Bee Health Coalition.

As far as feeding the bees, there are many options for carbohydrate and protein supplements so just call up some of the suppliers to talk to them about what they offer and talk to other beekeepers to get some ideas what might work or not. I also particularly like this recommendation by Randy Oliver about how to know if your colony has plenty of protein. Take a look at your larvae and see if they have plenty of food so they appear to be “swimming” in it or are they looking “dry”. **Here** you can find a photo of what “wet” and “dry” larvae look like .

Going back to what might have been happening this past year. If you’re from California you know that the winter 2014-2015 was pretty warm and seemingly there was not much if any break in brood cycle during that year potentially allowing *Varroa* mites to get an earlier jump onto reproduction. If you were not very diligent about *Varroa* management it could have gotten away from you quite easily. The prolonged drought leading to lack of plentiful forage for bees undoubtedly exacerbated any other issues that the bees were dealing with.

Now that the bees are out of almonds we all are focusing on increasing the colony numbers in order to ensure we have enough (and when I say enough I mean the number that each beekeeper deems as sufficient/optimal for their operation) of healthy strong colonies going into pollinating other crops, honey production, or research, and finally, going into winter in preparation for next year’s crop pollination. Let’s just hope that with the colder winter and the rain we got earlier in the year, both bees and us have a better year ahead of us.

UC IPM BEE PRECAUTION PESTICIDE RATINGS

As you know, pesticides are one of the potential issues that honey bees and other bees could face. And this is not only true for agricultural settings, but also for urban and suburban areas where homeowners want to control pestiferous critters in their gardens, and even beekeepers that need to manage various maladies so the colonies can survive and thrive. What I’m trying to say is that we’re all in this together and it has been very reassuring to start seeing all parties coming to the table for a conversation about how we ALL can contribute to best support pollinator health. One of the best places to start is by providing excellent educational and extension resources so people can remain informed on various topics including pesticide use. I hope you all had an opportunity to read the Almond Board of California **Honey Bee Best Management Practices for California Almonds** as it’s an excellent resource for all involved in crop pollination. However, if you were just told by your neighbor that they will spray something and you’re worried about how that might affect your colonies you might want to visit a fairly new Bee Precaution Pesticide Ratings interactive guide at <http://www2.ipm.ucanr.edu/beeprecaution/> developed and hosted by UC IPM. This webpage allows you to choose the active ingredient that interests you and it will provide you with the information on its potential effects on bees. These recommendations are based on the most current information available in searchable literature. However, despite the vast collection of manuscripts that characterize pesticide effects on bees it is very clear that we still have a lot to learn and particularly about pesticide effects on honey bee brood, sublethal effects

and particularly effects on other bee and pollinator species. I hope you will find this resource very useful in your endeavor to minimize bee pesticide poisoning and please feel free to share it with others.

POTENTIAL NEW TOOL FOR HYGIENIC BEHAVIOR ASSAY

Are you a bee breeder often having to perform hygienic behavior assay to evaluate your colonies? Do you use liquid nitrogen for this assay and dislike every minute of it? Well, then this article is for you. This past January, I attended the American Bee Research Conference which was held in conjunction with the American Beekeeping Federation in Florida. There I had an opportunity to hear a talk by Kaira Wagoner. She is a recently graduated PhD student in the **lab of Dr. Olav Rueppell** at the University of North Carolina, Greensboro. I always thought Kaira worked on very interesting and useful-for-beekeepers studies. In one such study Kaira has identified a compound that is released by brood when infested with varroa mites. In short, this compound could end up being used as a spray for spraying an area of capped brood which bees would then uncap and remove the larvae so the colony can be evaluated for the hygienic behavior. This spray is not yet available, but the last time I talked to Kaira they were working on finding some supporters to make this happen. This could be an excellent new tool for breeders and Kaira thinks that it might even be used as a useful varroa management option. Stay tuned for future updates.

ORNAMENTAL PLANTS AND NEONICOTINOIDS

Recently, we received an email from a beekeeper about promoting plantings for bee forage. He was concerned with the effects that the drought has been having on the availability of forage for bees so his local beekeeping organization decided to do something about it. They are beginning to work with local nurseries to have them clearly mark “bee friendly” plants in hopes it will promote their planting by homeowners. However, they are concerned, as many of you might be, about the possible effects of neonicotinoids that these plants might have been treated with. As there are many misconceptions out there I wanted to print this great response by Dr. Christine Casey, the Häagen-Dazs Honey Bee Haven manager. I hope you all find it useful.

Dr. Casey writes: “There’s not been a lot of study regarding neonicotinoid levels in pollen and nectar of ornamental plants treated during production. The results from the work that has been done are mixed, but in many cases pesticides were not detected at levels that would cause concern. This work has been done in Michigan, Minnesota, and Kentucky, where growing conditions are different than in California. Our warmer, sunnier conditions would tend to result in faster metabolism of neonicotinoids in plants. Keep in mind that neonicotinoid-free does not mean pesticide-free, but the primary concern with bees is systemic pesticides; many products used in ornamental plant production are not systemic. Nurseries should be able to tell their

retailers what pesticides have been used as they are required to file these records monthly with their county agricultural commissioner's office. This may be a moot point, however, as Lowe's currently does not allow its suppliers to grow plants using neonicotinoids and Home Depot is likely to do the same. These decisions are based on public relations, not science.

You are correct that the most important thing for bees is to plant flowers. I share the concern that homeowners will be influenced by the incorrect information in the media about neonicotinoids and that they will stop planting flowers in a misguided effort to "help." That would be a shame, so it is good that you are working with your local retailers to promote planting for bees. In terms of which plants to promote, there are lots of plant lists available, but the science behind them is often unclear. I would suggest you select plants from either our [lists](#) or UC Berkeley's [list](#) as they are both based on several years of observations by bee biologists. We also have a [one-page handout](#) that describes the attributes of a good bee garden that you are welcome to distribute."

If you would like more information or you might be interested in other matters relating to garden plantings for pollinators feel free to contact Dr. Casey at cacasey@ucdavis.edu

WHAT WE WILL BE DOING THIS SUMMER

Other than active outreach and extension programming our lab also has a very active and diverse research program. This summer, as soon as our colonies and packages recover we will tackle many projects we have slated for this year. Patricia Bohls and Cameron Jasper will complete follow up studies on the synergistic effects of miticides and pesticides on honey bee workers and queens. They will also be working on their individual dissertation projects. Cameron is exploring molecular mechanisms that are involved in regulation of pheromone production in the mandibular glands of both queens and workers. Patricia will be following up on some our previous work on the effects of drone seminal fluids on queen mating and reproduction. She will also expand these studies to better understand the role of Varroa in modulating these processes. We will be teaming up with a local beekeeper who has graciously agreed to let us use his hives for our large field test of several novel biopesticides and biopesticide formulations for control of Varroa. Finally, we are collaborating with [Dr. William Collins](#), Assistant Professor of Chemistry at Fort Lewis College in Durango, CO on testing a novel delivery method for thymol and citronellol directly to honey bee larvae for control of varroa mites. Lots of work to be done and we will keep you posted about our progress throughout the summer.

BEE SYMPOSIUM 2016

Honey and Pollination Center at Robert Mondavi Institute at UC Davis is partnering again this year with the Department of Entomology and Nematology at UC Davis to present to you the second annual "Bee Symposium: Keeping Bees Healthy". The last year's symposium was a GREAT

success with about 400 people in attendance and excellent speakers such as Dr. Marla Spivak (University of Minnesota), Dr. Amy Toth (University of Iowa) and Dr. Nigel Raine (University of Guelph, Canada). The program evaluations were truly outstanding and we are pleased to be a part of another symposium that promotes the awareness of the importance of bees to our ecosystem and our agriculture. This year's keynote speakers are sure to "blow your socks off". Dr. Yves Le Conte is the Director of the French National Bee Lab in Avignon, France and has spent his career researching varroa mite effects on bees and he has spent a good portion of his time studying bee pheromones as well. The title of Dr. Le Conte's presentation is "Honey bees that survive varroa mites in the world: What we can learn from French bees" which should be of interest to all of you who are dealing with varroa mites as well as those who might be interested in breeding for varroa-resistant honey bees. To learn more about his work you can read the Article by Mea McNeil in the April issue of Bee Culture.

You are sure to know or have at least heard about Dr. Dennis vanEngelsdorp who is an Assistant Professor of Entomology at the University of Maryland and project director for the Bee Informed Partnership (or as we all like to lovingly call it BIP). The BIP team has been conducting the annual colony loss survey since 2006-2007 which is responsible for the widely cited number of ~42% annual colony loss spanning 2014-2015. The BIP team is working hard to bring you the latest tools for successful colony management and to learn more about their work visit their website <https://beeinformed.org/> You should also take their [annual colony loss and management survey](#) if you have a few minutes to spare.

Other speakers include our very own Dr. Rachel Vannette and Dr. Brian Johnson, Both are Assistant Professors at the Department of Entomology and Nematology, UC Davis and work with honey bees. Dr. Vannette is an ecologist and she studies how microbes can influence plant-insect interactions including plant-pollinator interactions. To learn more about her work visit her [website](#). Dr. Johnson's work encompasses studies on honey bee evolution, genetics, behavior and health and he will be speaking about the division of labor in a colony and how it can help us understand honey bee health. To learn more about his work visit his [website](#).

We will also hear from [Dr. Quinn McFrederick](#) from the Department of Entomology, UC Riverside and [Dr. Claire Kremen](#), a MacArthur Foundation Fellow from UC Berkeley. The symposium will feature previously very well-received "lightning round" where various speakers will highlight their pollinator and pollination interests in short, 5-minute presentations. Students will present their research in a poster session and will compete for a monetary prize so make sure you stop by the posters to learn about their work and give them moral support. And of course there will be plenty of food and drinks to be had, as well as an opportunity to mix and mingle and talk about all the great things you've learned at the reception immediately following the symposium.

KIDS CORNER: "TO BEE OR NOT TO BEE" BY BERNARDO NINO

Spring is in the air and you are probably all excited to be spending more time outside. The great outdoors is abuzz with many flying insects and plenty that sting, yet few are actually

honey bees. And no matter how many times I talk about it with different people every spring I get a question from someone: “How do I know if my picnic is under attack from wasps or bees?” So here are some facts that will help you tell honey bees from those other insects.

Honey bees are a very specific group of bees and here in the United States only one species of honey bee (*Apis mellifera*) is present (although there are several subspecies). It is easy to get confused though, ants, wasps, and other bees are all in the same order Hymenoptera and share many of the same features and characteristics. In addition, other insects like some hover (syrphid) flies try to mimic honey bees since they are the best insect ever (just kidding!). They in fact have the warning coloration of bees and wasps in order to keep away potential predators.

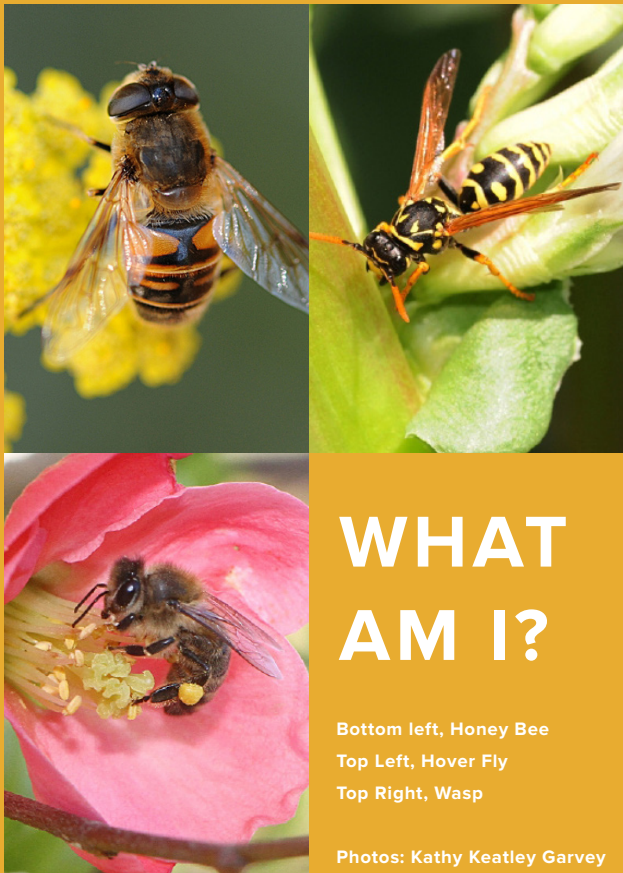
Here are some characteristics of the honey bees that make them what they are:

First thing’s first: honey bees are hymenopterans and therefore have TWO pairs of wings, unlike flies who have a single pair of front wings with modified rear wings that we call halteres and which look like little knobs on the end of a stick. Unlike wasps, which have a thin narrow waist, honey bees have a more robust body with a thicker-looking waist. Honey bees are also much harrier than wasps and have flattened legs they use to collect pollen. Both these features make them an excellent pollinator of many plants.

Honey bees make their homes in cavities above ground level. This means if the comb or nest is visible it is likely not a honey bee (although sometimes honey bees get confused and make a nest in the open branches of a tree). Many wasps will make their homes on tree branches or eaves

of houses and people often mistake these insects for honey bees. Some other wasps and bees make their homes in the ground and some can even be a hazard like yellow jackets or some hornets. People and pets have gotten injured from mowing the yard or digging around close to or over a nest.

Honey bees are a perennial species, which means the colony will live for multiple years. The honey bee queen will live and stay within the colony and even if she dies the colony will just raise a new one and the colony lives on. Sometimes for many years. Many other bees and wasps live for only a single season. Bumble bees start producing “princesses” which we call gynes, late in the season and they will find a safe place to spend the winter then start their own brand new colony in the spring. Similarly paper wasps and yellow jackets also start their colonies from scratch every year.



WHAT AM I?

Bottom left, Honey Bee
Top Left, Hover Fly
Top Right, Wasp

Photos: Kathy Keatley Garvey

UPCOMING EVENTS

April 28, 11:30am-1:30pm

Take Our Daughters and Sons to Work Day event at the Bee Haven

Kids of all ages will have an opportunity to catch and examine bees up close and learn a lot about bees and plants.

May 6, 5:30-7pm

National Public Gardens Day Open House at the Bee Haven

Guided garden tour at 6pm. Free sunflower plants to all visitors while they last.

May 7, 2016

Bee Symposium

[CLICK HERE TO REGISTER.](#)

May 14, 2016

“Planting the Bee Garden” course at the Bee Haven

[CLICK HERE TO REGISTER.](#)

May 20-21, 2016

Honey Sensory Experience

[CLICK HERE TO REGISTER.](#)

June 24, 2016

National Pollinator Week at the Bee Haven

Department of Entomology and Nematology
University of California, Davis

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AND ENVIRONMENTAL SCIENCES**

Honey bees leave their stinger in your skin, worker honey bees have a barbed stinger that will remain in your skin and help signal other honey bees to come defend themselves from intruders. Worker bees do not survive after stinging. The one exception to this rule is the queen. She does not have a barbed stinger and can sting multiple times if needed. Much like the honey bee queen, other bees and wasps are able to sting repeatedly and do not lose their stingers. By the way, if you get stung by a honey bee remove the stinger right away with your nail as the attached “pump” can keep pumping venom. Also, use some dirt (or smoke if you are already a beekeeper) to cover up the alarm pheromone that can tell other fellow bees there is a threat.

We hope this will help you be a more confident nature explorer and you can impress your friends with staying cool around a bee that happens to be a fly (but they don’t need to know that!).

A BIG THANK YOU TO THE E. L. NINO BEE LAB SUPPORTERS

Bee Happy Bees LLC, Camellia Society of Modesto, Dadant & Sons, Inc., Olivarez Honey Bees, Inc., Pat and Russel Heitkam, Nod Global, Jackie Park-Burris, Westwind Farms Inc.

DISCLAIMER: Mention of any company name or product does not constitute a promotion on our part.

Sincerely,

Elina L. Niño
Extension Apiculturist
Dept. Entomology and
Nematology
University of California, Davis

Davis, CA 95616
Phone: (530) 500-APIS [2747]
E-mail: elnino@ucdavis.edu

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