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November 2015 LCBA Newsletter

In This Edition:

Questions? Suggestions? Resources you'd like to share, stories you'd like to tell?

Please contact LCBA Secretary Susanne Weil: susanne.beekeeper@gmail.com or call 360 880 8130

UPCOMING EVENTS:

PLEASE MARK YOUR CALENDARS – LCBA'S NOVEMBER MONTHLY MEETING WILL BE THE 1st WEDNESDAY OF NOVEMBER ~ NOV. 4TH

On November 11, Centralia College is closed for Veteran's Day.

November 4th Meeting Topic: An Inside Look at How Package Bees Are Bred & Transported; How the Oxalic Acid Vaporizer Works to Control Mites

Speaker: Mike Radford, Northwest Bee Supply, Sequim, Washington

When: 6 – 8:45 p.m.: Social Time 6 to 6:30 p.m.

Where: 103 Washington Hall, Centralia College 701 W. Walnut St., Centralia WA

What: Mike Radford of Northwest Bee Supply is a longtime beekeeper who rears bees in Sequim. He will give us some insights into what it's like to raise bees on a larger scale, what's involved in transporting them, and more. Also, Mike has used the new oxalic acid vaporizer method of delivering mite treatments into hives & will share a Powerpoint about how this works.

Also: short business meeting with election updates & beekeeping Q&A.

FYI to members: "Rendering Beeswax for Candles & More" has been postponed to 2016. More news as it happens!

Wednesday, December 9: LCBA's 7th Annual Holiday Potluck

Please mark your calendars & get ready to share good food, good fellowship, door prizes, & after dinner, a brief monthly meeting with board elections, fundraising drawing for our 2016 Youth Scholarship Program, our traditional Beekeeping Q&A, suggestions for 2016 speaker topics, and more. Details next page:

When: 6 – 9 p.m.: Social Time 6 to 7; Dinner 7 to 8; Brief Business Meeting, including Elections & Youth Scholarship Program Drawing, 8 to 9.

Where: Newaukum Grange (directions will be in your December newsletter)

Please Bring: A dish of food to share & a plate, cutlery, & cup to eat/drink from. The Grange has tables & chairs, 3 ranges, a refrigerator, & plug-ins for hot pots. LCBA will provide coffee, tea, hot chocolate, & napkins.

Food Drive: If you'd like to bring canned food or dry goods for the Greater Chehalis Area Food Bank, please do – we'll have a donation box.

Drawing to support 2016 Youth Scholarships: Featured items will be noted in the December newsletter. If you have an item to donate, please bring it!

Questions? Contact Susanne.beekeeper@gmail.com or call 360 880 8130.

Notes from LCBA's October 14 Monthly Meeting

Topics: Honey Bee Pheromones & Venom; Speaker, Dr. Dewey Caron

Above left, "Honeybee exposing her Nasonov gland to release an orienting pheromone," by Mistressbeek (License: public domain); right, "Bee-sting-abeille-dard-2" by SuperManu (license: CC BY-SA 3.0).

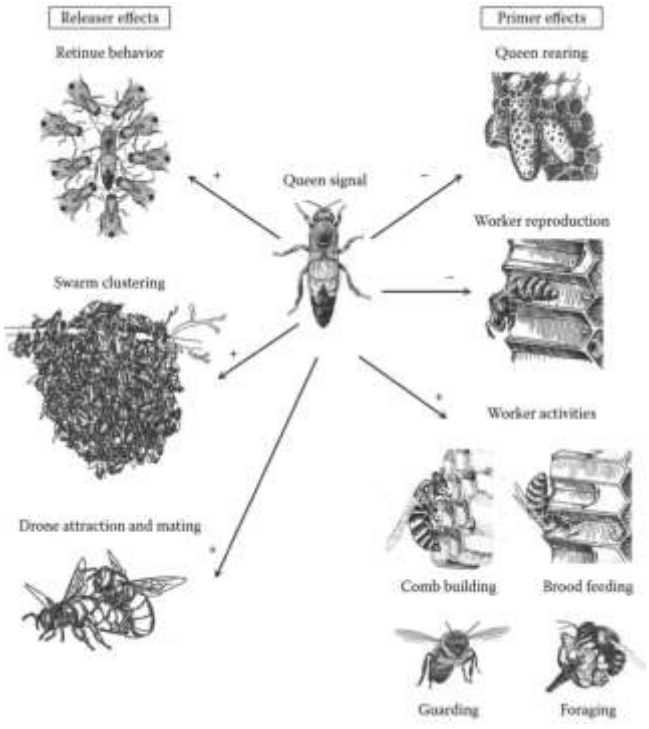
Vice President Kevin Reichert introduced our returning speaker, Dr. Dewey Caron, Emeritus Professor of Entomology from the University of Delaware, affiliate faculty member at Oregon State University, and one of the organizing researchers at the BeeInformed Partnership. Dewey reported that the Pacific Northwest bee survey data for the past year are now ready: you can find the data at Pnwhoneybeesurvey.com. As over-wintering loss research continues, he plans to survey Washington beekeepers again in 2016, and hopes to survey Lewis County beekeepers again this coming April.

Pheromones – the chemical language of honey bees: By secreting the chemicals called pheromones from assorted glands, bees regulate behaviors like queen rearing, drone attraction, guarding & nest mate recognition, swarming, and more. To be effective "bee stewards," we need to understand more about how pheromones work.

The discovery of pheromones: Dewey began by explaining that although we know a lot about the honey bee's complex Dance Language communication, chemical (pheromonal) communication, although surmised since 1926 when von Frisch discovered the Nasanov gland, has only recently been deciphered. Queen substance was discovered in 1954 that queen substance, and its core chemical, 9-ODA, was not isolated until 1960; the mating attraction of the queen was not found until 1962. Dewey said that he still doesn't grasp it all. What we do know is summarized in *Honey Bee Biology and Beekeeping* (its chapter on pheromones has been updated); this meeting's slideshow is available on our website under the Monthly Meetings link, so those interested in the specific chemical details can get a start there.

Pheromones are chemicals secreted by the exocrine gland: these chemicals call forth behavioral or physiological responses from another animal of the same species. Looking in the bee hive, how do bees use the modality of chemicals to communicate via smells? For bees, pheromones are key in maintaining the colony, and the bees have many back-up systems for getting things done. Pheromones in honey bees break down into two main categories: primer pheromones, which govern long term developmental and behavioral changes, and releaser pheromones, which prompt a fast, specific response when bees smell them.

Queen substance pheromone: For one major example of how pheromones work in the colony, consider the queen: her reign as the monarch depends largely upon her queen substance or queen signal pheromone: its smell gets picked up by the queen's retinue, as well as by antenna contact and mouth part contact. When retinue bees whose mandibles have touched the queen feed other bees, they also pass along queen substance. Finally, since wax is a chemical-holding sponge, the queen passes along this pheromone as she walks on the comb.



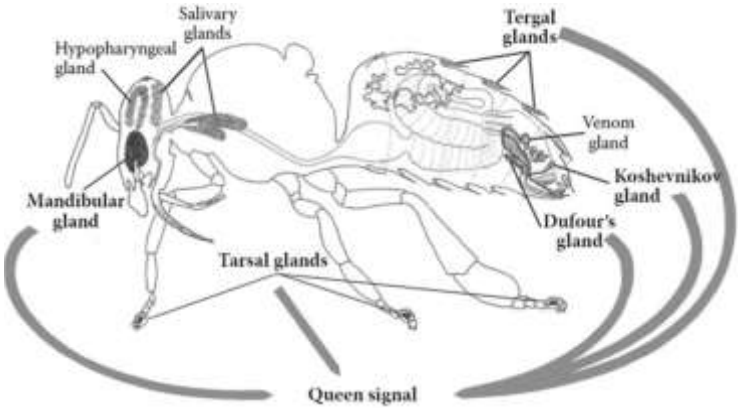
Above, behaviors governed by releaser & primer pheromones (from Dewey's slideshow)

Queen mandibular gland pheromone – QMP - contains 17 different compounds – together, they hold the colony together. We beekeepers interrupt it at times; bees themselves interrupt it. Virgin queens have very little of the key chemical, 9-ODA; it takes them up to 6 days to develop enough to attract drones – important for beekeepers to know if they are counting down days to see whether a supersedure queen has been successfully mated. However, mated queens have much 9-ODA, plus other chemicals (for details, see Dewey's slideshow). Prime queens have even more. An aging queen is reflected in a weakening signal. The queen, on average, secretes 200 micrograms of the key compound from her head: this is too small for us to measure, but it is big to a bee. At this time of the year, the colony is smaller, so the queen equivalent varies with the colony population.

Now scientists can synthesize these queen mandibular pheromones: you can buy them, but studies of how effective these synthetics are contradict each other. So far, most studies have tended to look at just one chemical compound, so they got different results (more on this below).

"Marked Russian (dark) queen (R. Williamson photo) has a better defined worker retinue compared to marked Italian queen right (Figure 8-1). Note: Russian queen (in 'resting' behavior) has a better defined queen retinue compared to Italian queen (who was searching for clean, empty cells for egg laying)."

Releaser pheromones govern retinue behavior, as shown in the contrasting retinue photos above. A good retinue suggests that the queen's signal is strong, whereas a poor retinue suggests a queen giving a weaker signal. The photo on the right could be either an older queen or a poorly mated one. However, retinue behavior is not governed by the mandibular gland alone.

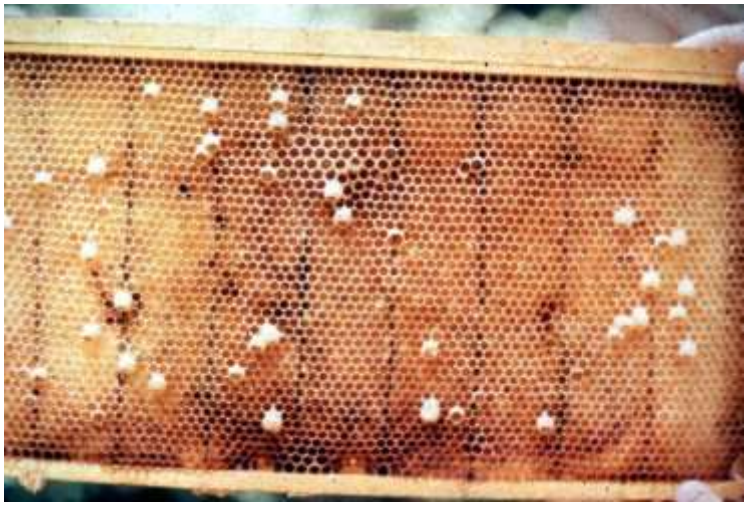


Above, diagram of queen bee gland structure from Dr. Caron's slideshow

Swarm stabilization is governed by another releaser pheromone. Other than scout bees, there's very little flight from the swarm - because the queen is at its center. The queen still works better than the QMP chemical synthesized and deployed on its own (more on this later).

Pheromones and sex attraction: How do pheromones attract drones? As Dewey's slide notes, "mating of the virgin queen and drone ONLY occurs outside the hive and only in specific locations, termed Drone Congregation Areas – DCA's." Dewey displayed a photo showing a caged queen attracting "a comet of drones": if the key pheromonal chemical, 9-ODA, is substituted for a live caged virgin queen, the drones within the DCA would behave similarly. Outside those mating areas, we don't see this behavior; the drone attraction doesn't take place. To find a Drone Congregation Area, the scientists "suspend a caged virgin queen from a helium balloon and walk about until we observe the drone comet formation; [they] can then map the specific location of the DCA." For details about how pheromones affect mating behavior, Dewey recommends Larry Connor's book, *Bee Sex Essentials,* and the more recent *Mating Biology of Honey Bees,* by Gudrun Koeniger *et al.* (Dewey had these books available for sale after his talk, and you can also find them online.)

Multiple Queens? Primer pheromones get more complex. For example, most colonies have just one queen. After 50 years in bees, Dewey thought he had seen it all - but the week prior to our meeting, he visited a mentee who had combined a very late – September - swarm that had recruited into a bait hive with another colony. The bees then swarmed, were caught, rehived - and then they saw 2 queens, right next to each other. Was this a case of absconding? Usually, you just don't see 2 queens in a colony – in September!



Above, emergency queen cells developing in one of Dewey's slides.

QMP also inhibits bees from rearing replacement queens. After the queen is removed from a hive, emergency cells will be started – bees modify the worker cells, drawing them out into vertical cells that can accommodate a queen larva. Swarming and supersedure also relate to colony size and dispersal of QMP. If the queen does not have enough chemical to supply all the bees, or too many bees for the pheromone to get around, those are reasons for bees to swarm or supersede; workers are giving the message back to their queen. By supplementing with QMP, a beekeeper may be able to suppress swarming.

Using QMP during mite control: if you take out the queen to break the brood cycle for Varroa control, giving QMP will prevent bees from thinking they are queenless and raising new queens. QMP is never the same as a queen in the colony – smell alone is not as effective as the touch of the pheromones, spread by the queen and then by workers' mandibles – but it helps.

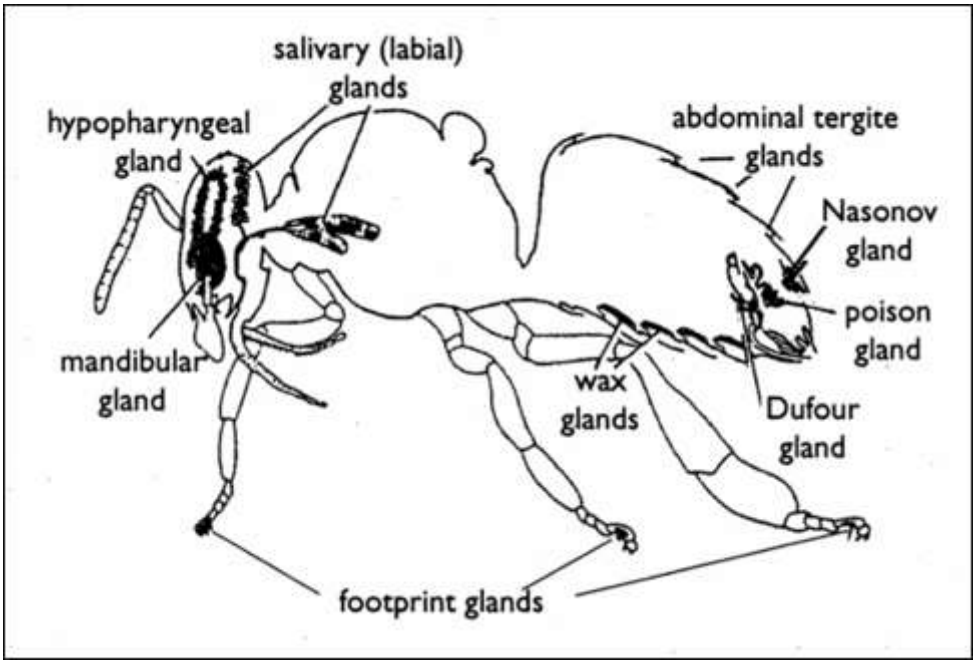
Suppressing workers from developing ovaries is another important function of QMP. Around 2% of workers are capable of producing eggs. Many beekeepers don't realize that some of these workers do indeed lay eggs, all the time. But workers police this. Again, there are conflicting studies about whether inserting QMP effectively suppresses laying workers. This picture is complicated by the many factors that come into play: juvenile hormones plus QMP plus secretions from the Dufours gland plus brood pheromones . . . Those who'd like to learn more about adversive behavior learning can consult Randy Oliver's 2010 article: visit http://scientificbeekeeping.com/the-primer-pheromones-part-4-reproduction-and-survival/ .

The role of other queen glands: Complicating all this is the role of other glands in the queen that secrete both releaser and primer pheromones. The tergal glands, in particular, help regulate retinue behavior. These glands are more important for queen recognition in African honey bees, both *A.m. scutellata* and Cape bees: these swarm very quickly because the queens can't produce enough QMP to keep them in line.

The Dufours gland secretes fertility signals right where the queen is going to lay eggs, so chemicals from this gland get onto the eggs as they are laid: this causes worker eggs and drone eggs to smell different. This is useful because it enables the workers to police just by sniffing. Since drones are all laying workers can produce, this policing is important. ***Even brood make pheromones*** (or, perhaps better put, they give them off). Young brood cells give off a different chemical compound than do older brood cells; worker and drone brood have different scents, too. Other than marks by queens, eggs don't' have pheromones, not at that stage of development. However, we do know that bees can detect a mite in a sealed worker's cell and open it up, so the pheromones may help with that, too.

The Koshevnikov gland is the queen's sting gland. 28 compounds present in this queen gland are not present in worker glands. Both balling behavior and aging signals may be governed by this gland.

Glands & Pheromones in Worker Bees: workers' glands govern building, food processing, and communicating. See the diagram below: the workers' mandibular gland secretes a completely different pheromone than the queen's mandibular gland. The hypophyrngeal gland relates to building. Salivary (labial) glands relate to food processing.



Above, worker bee glands (from Dr. Caron's slideshow)

Caste-specific secretions in workers with developing ovaries inhibit their worker sisters from developing ovaries, too.

The Nasonov gland secretions play a key role in the orientation and recruitment of forager bees to the colony. Bees need both the queen and workers to release the trail pheromone, mainly near water. Also, the scent gland will be used by scout bees to mark a new site. The scout bees race from a temporary swarm site to a target new home, and as they do this, they release the scent to help the bees find the new site. If you have watched a swarm in action, you have probably seen how fast they go when they find that new home.

Using Nasonov secretions to lure swarms: this pheromone, too, has been synthesized and can be put into bait hives. The commercial chemical has 2 parts citral, one part geroniol, and one drop lemon oil. Lemongrass or QMP are put in just to make the smell more attractive.

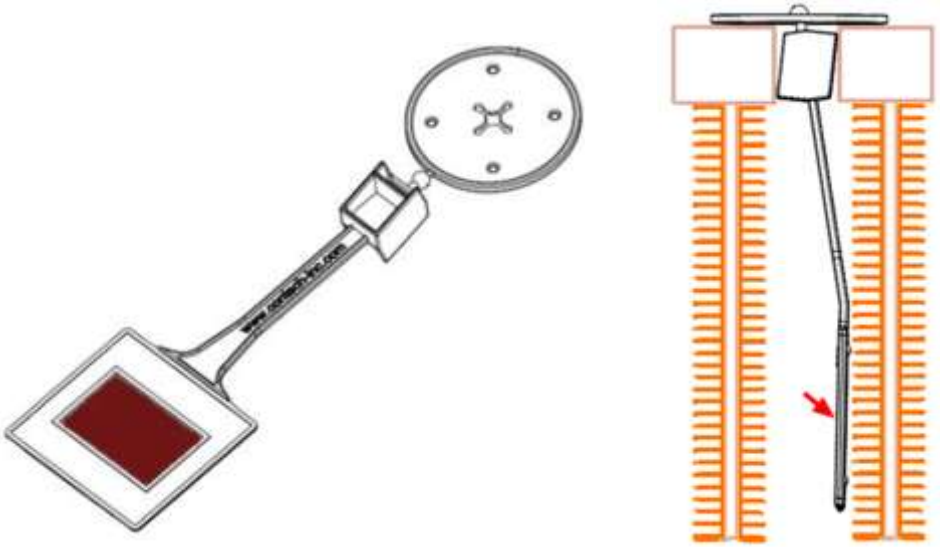
Tarsal glands, the "footprint glands" of workers, influence not only orientation, but foraging behavior. Tarsals secrete a chemical that workers use to mark the colony entrance. They also use it to mark visited flowers: if you wonder why you don't see bees on a particular flower, that may well be because these chemicals tell them that it has been visited by another bee – as Dewey put it, "Don't waste your time here - I already harvested the rewards - go find your own flower!" Dancing bees have recruitment pheromones: these are from unspecified glands.

Nest-mate recognition: foraging bees need to learn where they live, but that is less complicated if they can recognize the odor of nest-mates. Cuticular hydrocarbons help the hive smell like home. Bees transform ethanol derived from fermented nectar; then, they exude that ethanol through their exoskeletons. Next, workers pick it up both via physical contact and vaporization. This ethanol is also produced in the brood and by the queens, but what the foragers do is burp and give out the colony pheromone. The whole colony makes this odor.

A tip for orienting hive boxes: If you have hive boxes that look the same and face the same way, this complicates life for your bees: how do they tell which box is their box, particularly if you have been quaffing at a fermented flower and are a little disoriented? If you are bringing food, you can bribe your way into a colony, but not always. The guard bees' job is to smell, and they do it all with pheromones.

The worker bees' famous sequence of duties is also activated by pheromones. Foragers put out a special pheromone that helps "keep young bees in their place." This is crucial, since hive duties are very important, and it is easy for foragers to die.

Superboost is a blend of 10 fatty-acid esters produced in larval salivary glands: it stimulates foraging for pollen and nectar, and promotes enriched protein content in the hypopharyngeal and mandibular glands. That enriched protein is fed to the larvae and the queen, and helps maintain colony vigor. Sadly, the Superboost company has gone belly up: another company bought them out and is mainly interested in flea chemicals, so we do not know the future of Superboost.



Superboost strip, left; inserted on frame in the hive, right (from Dr. Caron's PowerPoint)

However, Superboost has positive effects for beekeepers. Strips of Superboost get placed between brood frames and works like having an artificial queen in the colony. Researchers asked: does Superboost help spring build-up? It did: bees that had Superboost ate more, had bigger brood comb area, more bees in colony - twice as many bees as hives that lacked Superboost. Studies in British Columbia and New Zealand showed that significantly more colonies treated with Superboost in spring built up and produced splits than did non-treated colonies. The effect of Superboost on foraging was examined in Texas in 2007: it showed a heavier weight of pollen brought back to colonies infused with Superboost. Overwintering survival can be affected, too: 80% of colonies that had Superboost survived winter, as opposed to 31.4% without Superboost.

Does Superboost affect crop yield? A study done in carrots in Oregon. east of the Cascades, assessed the effect of Superboost over 4 years, counting numbers of seeds. There was an overall 18% increase in seeds among the carrots, showing that pheromone application does

make a difference. The outcome of a canola experiment was not quite as favorable, but still showed gain.

One last worker pheromone we need to know – worker alarm pheromones! These alarm pheromones are produced by sting and mandibular glands. See the photo below of the sting left in a victim: note, that liquid at the top, right, is from the digestive system. If you raise a hive cover in colder weather, you disrupt their "smell environment," so you may see all the bees raise their butts, expose their sting gland, and fan their wings, and you may see a drop of venom. Dewey noted that frustrated African bees will actually throw venom at you through your veil! The alarm pheromone smells like – depending who you are – like bananas, or vanilla, or butterscotch. If you smell as sharp sudden sickly sweet scent – bee-ware! This is why we use smokers: the smoke masks that pheromone. The soldier bees will sting, not the guard bees at the hive entrance.

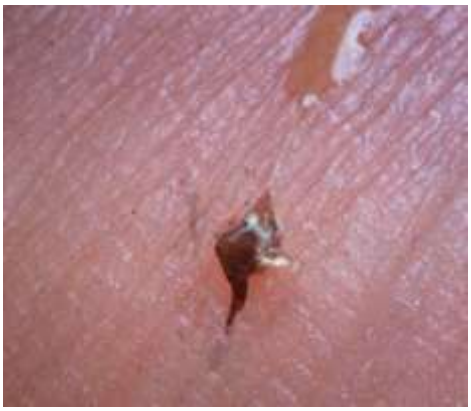
Above, veil dotted with stingers (from Dr. Caron's slideshow)

STING ALLERGIES: We get not only venom, but other things in the bee's stinger. Dewey noted that he is not an M.D.: if you are concerned about your level of allergic reaction, the first thing you should do is see a doctor, who can test you and if need be, prescribe an epinephrine pen. However, beyond that, most doctors do not know much about sting venom. There's a big difference between allergies to foods, or to tree pollens, or to things on your skin. Further, since the sting is injected into you, you get an internal reaction. About 1% of people might have a sting allergy, yet do not know it because they have not been exposed to a sting.

Sting reactions over time: Most allergists think you need to be exposed to a sting, and that you will generally not get the reaction that first time, but upon subsequent stings. With

subsequent stings, the body has time to build up immunity: however, for people with allergies to venom, that does not occur, and we do not know why. What is totally confusing is that most of us take up beekeeping later in life, and our tolerance for this kind of injection system just changes, whether we are talking about drug overdoses or proteins in a sting. We are more likely, as we get older, to experience a reaction. If you do have an allergy, one single sting can be a serious affair. Often when that happens, it turns out to be yellowjackets, not bees, who were the offenders.

Multiple stings: Sometimes we may get a bunch of stings at once, as in doing a colony removal, and have a larger than normal reaction. The studies done on this are very conflicting: is it trouble that you get a lot of venom at once, or is it that one sting that gets in a full venom load can release all of that material? We often think head stings are worse because we have less tolerance: a little bit of closing of breathing apparatus, coupled with stress, can lead to a cascading effect. Of course, if you experience breathing problems following a sting, you should run, not walk, to the emergency room.



Above left, soldier bee; right, stinger left in victim (photos from Dr.Caron's slideshow)

Can you build up your immunity? One thing you can do: take a few bees to your allergist and get him/her to inject you with a crunched up mess of bees. However, that may not help build tolerance. You can start with just diluted venom and build up through a fast or slow track of injections: fast track is 3 shots a week, so you build up faster. However, there can be complications from that. The success rate has been about 97%: the fast track approach can help within 6 months, whereas the slower track takes one to two years.

Questions & Answers: Gordon Bellevue noted that his reactions vary greatly: sometimes he gets lots of swelling, yet sometimes it's minor, like a mosquito bite – he can see no rhyme or reason. Does anyone know why? Dewey said that he can relate: recently he had a sting in his wrist that hurt awfully and another in a finger that he was hardly aware of. Art Sporseen asked if it could be because of blood flow at a sting site: Dewey noted that in most cases of people who get sudden anaphylactic shock and die, or experience a bad reaction, usually they have other issues in health that leave them vulnerable. Mel Grigorich noted that he finds a difference if the stinger just brushes and he can flick it out, or if he ends up smashing it in, when it is worse. Dan Maughan got stung on his eyelid - and it was brown and wrinkly for 6 weeks! Another question: what do you do if you get a bee in your ear - how do you get it out? Walt Wilson suggested, blow in the other side. . . .

Do bees have preferences among sting victims? Question: if you have cancer, would a bee sting you less? Dewey says not to his knowledge, but there are some disease conditions that bees can smell on human bodies, and some types of cancers are among them. Dennis and Joanne Morgan noted that within 72 hours, the sting swell effect is gone; that was most people's impression of their sting history. Also, Dewey noted that scratching, including in your sleep, can cause infections: Kevin recommended anti-itch crème. Dewey noted that some fortify themselves with half a dose of Benadryl before going to the bee yard, and then, if they get stung, take the rest afterward: that speeds up the 72 hour cycle.

Does being allergic to one stinging insect mean being allergic to all? No, because honey bees, wasps, yellowjackets, etc., stings contain different chemicals. Robert Tuininga asked if it's true that the season makes a difference. Dewey says that in the very early spring, bees may have less venom than later on, but it changes fast. Walt Wilson said that for him, a poultice to draw venom out right away helps; so does a heat gun applied to the wound site helps. Dewey noted that no research has been done on temperature and some wondered if anything cooling might help.

Nest-mates (R. Williamson photo from Dr. Caron's slideshow)

Laying Workers & Pheromones: Kevin wanted to know how pheromones affect what we do about queenless hives. For example, if you have a queenless hive with a laying worker and a queen-right hive, should you combine them? Dewey said that pheromone supplements don't help when colonies have already gone downhill: if you unite them, it can go either way. Sometimes laying workers prevail and kill the queen; sometimes the queen prevails. There have not been enough studies to suggest which happens more. Pheromones can be useful, but they work best under more normal conditions, not to recuperate deterioriated colony situations.

Shaking off the layer worker – does that work? Kevin asked whether the "shaking off the laying worker" method works (if you walk away 50 feet and shake them off, these heavier girls who've never been outside can't get back to the hive). Dewey said that, again, this is our conventional wisdom, though it is not backed up by studies. Dewey thinks this can also work as a method of swarm control: ideally, they will go back on the foundation. It is the shock value that makes it effective: it shakes up their situation radically. Ed Odell asked about laying workers: are they larger worker bees, and if so, are they born from old drone cells? Dewey answered that they do not come from drone cells, but their abdomens are larger, so they are larger bees – however, they are not larger to the point where you could recognize them by size.

Bee venom therapy: does it work? A member asked about the kind of venom therapy that numbs the skin, with 40 to 80 stings administered at one time: depending on the

practitioner, Dewey responded that he has even heard of higher frequencies. This does seem to work; however, most who submit to this barbaric treatment are well along in deteriorating health conditions. Some say they regain use of their body, but what we need to do is fractionate venom and see if we can use only the parts that give relief. They have done autopsies of animals treated with venom, and it didn't help arthritis, but apparently what venom does in your body is relieve pressure when you move, so you have the same amount of arthritis, just less discomfort, so you move more. The American Apitherapy Association works on this: visit www.apitherapy.org.

Kevin thanked Dewey for another informative and entertaining talk, and we went to our pre-business-meeting break.

October 14 Business Meeting:

2016 Board Elections & Possible Change of Monthly Meeting Day to 2nd Thursdays: This section of our business meeting was held before Dewey's talk so that those who had to leave at the break could participate. Secretary Susanne Weil reported for the Nominating Committee (Susanne and member Nancy Toenyan). As noted in the cover letter to our October newsletter, under LCBA's new bylaws (adopted last fall), our nominating committee is required to send a slate with a candidate for each vacant position to all current dues-paying members by November 1; any additional nominations by members can be sent to Nancy or Susanne by Nov 15 (Susanne, Susanne.beekeeper@gmail.com; 360 880 8130; Nancy, ntoenyan@tds.net).

Susanne also noted that board positions are unpaid volunteer positions with no reward other than the pleasure of being of service. To serve on the board, one must be a current dues-paying member; Kevin noted that before nominating anyone, best check with them to bee sure they are willing to serve. To see descriptions of board jobs, visit our website: http://lewiscountybeekeepers.org/home/constitution__bylaws. If you are not interested in being a board member, but would like to help the board with particular projects, please contact the nominating committee about that, too.

Offices Up For Election: President, Treasurer, Community Outreach Coordinator, and Mentorship Coordinator are up for election for 2016. Our president for the past 4 years, Norm Switzler, is term-limited out at the end of 2015 and will become our *ex-officio* past president; our VP, Kevin Reichert, is willing to run for the presidency. Current Treasurer Rick Battin, Community Outreach Coordinator Dan Maughan, and Mentorship Coordinator Martin Stenzig are willing to serve again. Kevin's candidacy for the presidency throws open the vice presidency, as the bylaws prohibit anyone from running for two offices at once.

Vice Presidential Candidate & Possible Change of Meeting Date: Given the short turn-around from our Oct 14 meeting to Nov 1, the board and nominating committee have actively looked at possible candidates for the vice presidency. LCBA's founding president, Bob Harris, known to many newer members as host of our annual hive assembling workshop, is willing to run for VP, but because of his pastoral duties, he is not able to attend Wednesday meetings; Thursdays looked most feasible as the board looked into the question. A number of members have Wednesday night church and other commitments and have inquired about different monthly meeting dates, so the board will ask our membership to vote for their meeting night preference – 2nd Wednesdays, or 2nd Thursdays – in a secret ballot at our December 9 potluck, our annual membership meeting.

Members discussed the possible meeting change. Several said that Thursdays would be more convenient for them or others they know. It was also noted that everyone has to make choices and set priorities, and moving the monthly meeting date to accommodate a few may not be fair to those who have worked out their schedules to make LCBA attendance possible. It was asked whether the college would let us use Washington Hall 103 on Thursdays; Susanne had checked on this and been told that so far there were no conflicts for Thursdays. Finally, it was noted that the change of date would also require a bylaws language change, as the bylaws specify 2nd Wednesdays.

Kevin thanked members for sharing their thoughts and encouraged those present to send nominations by November 15 if they or a member they know would like to run for a board position, and to contact a board member if they have questions or concerns. Board members' contact information is under the "Board of Directors" link from our homepage: http://lewiscountybeekeepers.org/home/board_of_directors .

NOVEMBER'S MONTHLY MEETING IS ON NOV 4TH – NOT NOV 11TH! Susanne also reminded members that because the college is closed on November 11, Veterans' Day, we have moved our monthly meeting to November 4th, same time, same location. Please mark your calendars! Mike Radford of Northwest Bee Supply will give an insider's insight into the package bee business: Mike trucks bees all over the PNW and even flies them to Alaska. Mike will also have a slideshow about the new oxalic acid fume vaporizer, an in-hive tool for Varroa control. Kevin noted that oxalic acid has been legal in Canada for a while – it is very promising.

Possibility of Getting a Beekeeper onto the Lewis County Noxious Weed Control Board: Susanne reported that Nancy Toenyan, one of our Journeyman Beekeeper candidates, is applying for the vacant Onalaska-Salkum-Mossyrock position on the Weed Board. Bill Wamsley, our county Weed Board director, has spoken at our past meetings and welcomes the idea of having a voice for pollinators; the Weed Board is definitely concerned about their protection. Nancy would need ten signatures from residents of Onalaska, Salkum, and/or Mossyrock to be eligible for the petition; Nancy had a work conflict with tonight's meeting, so Susanne made the application available. ***FYI: the application will be available for signatures on Nov. 4, too.***

Treasurer's Report: Our checking balance is $2986.23; the Youth Scholarship fund has $1205.68.

Upcoming Events: Susanne reminded members that our November monthly meeting will be on the 4th, not the 11th, since the college is closed for Veterans' Day. Also, Sharette Giese's rendering wax presentation had to be canceled for scheduling reasons, but we're hoping to have it next year. Meanwhile, Sharette's process is available to read on our website: http://lewiscountybeekeepers.org/honey/rendering_beeswax. Thanks to Sharette for sharing it!

Community Outreach Report: Community Outreach Coordinator Dan Maughan announced the October 17 Seedpod Farm Harvest Festival in Centralia, a family-friendly event organized by members Julie and Adam Gullett. LCBA will have a table staffed by Dan, Gordon Bellevue, and Pamela Daudet. Dan also noted that he has bought a special kind of observation hive – one with sharp, detailed photos of various bee behaviors affixed to frames. This is a way to show kids in

schools some views of how bees work inside the hive without actually moving bees and dealing with those risks, though we expect to continue having the live observation hive at the Fair.

Mentorship Report: Mentorship Coordinator Martin Stenzig reported that we have about 40 mentees matched up with mentors. Next season, if you are a member and want a mentor – or want to BEE a mentor – please contact Martin (see board contact info, above). Martin needs your contact information and the area in which you are willing to volunteer. Susanne added that counting up the hold harmless agreements, we realized that we had over 100 individuals attend our mentorship workshops in 2015 – many of whom attended multiple workshops.

WSBA Report: Susanne and Education Coordinator Peter Glover attended the WSBA Board meeting on October 11. Susanne has been re-elected as WSBA secretary and noted that WSBA's new president has a particular interest in connecting the association with hobbyists in bee clubs around the state. WSBA is still working on liability insurance for local associations; Susanne and Peter made a motion that WSBA not raise its dues, as it had planned to do in 2016, since the insurance is not yet available: this motion passed WSBA's board unanimously.

Kevin reflected that the board is looking at what value LCBA gets from paying dues to WSBA, $1 per paid member as of the end of March each year. Peter noted that WSBA dues help support research at the WSU bee lab: WSBA also helps sponsor graduate students doing research with Steve Sheppard. Also, WSBA has had some significant successes in lobbying on behalf of bees and beekeepers in Olympia: the bill officially recognizing beekeepers as farmers passed the legislature and now has leveled the playing field for commercial beekeepers in Washington, who previously had to pay state taxes on pollinating revenues, whereas out of state beekeepers did not. Also, WSBA has been working with the Department of Transportation to preserve roadside forage rather than spray it, and is working with the Noxious Weed Control Boards to encourage replanting with bee-friendly forage when invasives are taken out; in particular, they are working with the Weed Board to preserve blackberries since they are critical bee forage.

Susanne also reported on the meeting between board representatives of Pierce County Beekeepers, Olympia Beekeepers, and our board. We compared notes on how we offer our apprentice and journeyman beekeeping classes. The other groups were particularly interested in how LCBA's mentor workshops and youth scholarship program work. The three boards' representatives tentatively discussed trying to put together some kind of public outreach event

for beekeepers in 2016 as well as something regional that would bring beekeepers together for some kind of special workshop and/or speakers as the old WSBA conferences used to do.

Beekeeping Q&A: Kevin led our traditional beekeeping Q&A. Walt Wilson noted that he put in candy boards at the end of September, but the bees are still foraging. Should he feed them again? Kevin said it won't hurt to give them a candy board, just be sure that they haven't eaten it all up before the weather gets cold and they really may need it. Kevin is now feeding 2:1 syrup to his bees. He notes: don't let them back-fill the brood box, or the queen has nowhere to lay. Our warmer temperatures make fall management a little tricky – bees are foraging, but not finding much. We don't want them to go through all their food supplies early, so supplementing with syrup and pollen patties can help. Kevin also told an entertaining tale of rescuing a wild honey bee hive found by Gottfried Fritz in a clearcut. With Jeanne and Dianne helping as sherpas, he and Grant packed out the comb. They had planned to put it in a notched box, but the comb fell, so they pinned it and put it in a single box and married it in with another colony.

BEES IN THE NEWS

Thanks to Fran Bach, Steve Norton, Fran Bach, Raine Lee Ritalto, Marcelle Stenzig, Kimo Thielges, and the good folks at Bee Culture and American Bee Journal for sending stories.

"Biting Back: Backyard breeders are creating a new kind of hero honeybee—one that chomps off the legs of mites and saves the hive": ***On Earth, Magazine of the Natural Resources Defense Council*****, 24 Oct 2015.**

"A varroa mite on the head of a bee nymph," by *Gilles San Martin* *(Licensed via Wikimedia Commons, CC BY-SA 2.0)*

The Heartland Honey Breeders Cooperative – made up of 8 states in the Midwest – is working with researchers to fast-forward evolution by breeding bees that are not only resist mites, but actually fight them off. Participants choose queens from hives whose mite levels are relatively low and breed them to "drones that have an affinity for chomping off mite appendages" – surprising as drones' mandibles are not strong. The article suggests that workers also fight mites: "When a mite latches onto a bee, she knocks it off and bites it. Even if a mite is simply scurrying nearby, a bee will chomp down and tear a leg or two off. A mite that can't crawl around and find a host doesn't survive long, typically dying within 48 hours."

Greg Hunt, an entomologist at Purdue University, also selects mite-biting bees to breed from. About 40 breeders from the Heartland Coop transport queens to Hunt's lab each summer for insemination by drones from mite-fighting lines. "The event's been dubbed the 'Instrumental Insemination Fest.' ('Beekeepers are weird,' Hunt says affectionately.)" In 2014, the head of the Heartland group just on his own raised over 500 queens from Purdue queens.

Do the bees actually pass on "leg-munching genes"? Early results suggest that they do: "[s]urveys found that in hives with 'Purdue bees,' 59 percent survived over the course of a year, compared to 22 percent in commercial hives. Because so many more buzzers lived, Purdue bees also produced more honey." The Heartland beekeepers are helping collect data by counting mites on sticky boards from mite-biting bee colonies and those not in the study.

Purdue and Heartland are hoping that more queen breeders will get involved. To read more, visit: http://www.onearth.org/earthwire/backyard-honeybee-breeders-fighting-varroa-mites

Above, a Carniolan girl with attitude: "Apis mellifera carnica worker hive entrance 3" by Richard Bartz (License, Wikimedia Commons, CC BY-SA 2.5)

"Wimps or Warriors? Honey Bee Larvae Absorb the Social Culture of the Hive, Study Finds": *American Bee Journal,* 30 Oct 2015

Researchers at the University of Illinois (Champaign-Urbana) have found that the "social culture of the hive" determines how aggressive or gentle larvae will grow up to be. In an earlier study, researchers "cross-fostered adult bees from gentle colonies into more aggressive colonies and vice versa," then studied "their brain gene expression." That brain expression turned out to be a "complex pattern . . . partly influenced by their own personal genetic identity and partly influenced by the environment of the colony they were living in." Next, researchers set out to learn at what point in bees' development they attune to that social world of the hive.

The study just published reveals what happened when the "researchers again cross-fostered bees, but this time as larvae in order to manipulate the bees' early life experiences. The larvae were from a variety of queens, with sister larvae divided between high- and low-aggression colonies." Then they moved the larvae from their "foster hives" to the lab the day before hatch-out. At the lab, the baby bees' behavior was tested "by exposing them to an intruder bee" (to see a video of "honey bees responding to an intruder," visit: https://www.youtube.com/watch?v=4amHuHnk5XM).

What did happen? The baby bees from the colonies labeled aggressive proved “10 to 15% more aggressive” than those from mellow colonies. This suggests that even larvae can be influenced by “social information” from their colony. One may wonder whether genetics, too, play a role: the researchers found that "[e]ven sisters born of the same queen but reared in different colonies differed in aggression, demonstrating the potency of this environmental effect."

The U-Illinois research team was startled to see these results: after all, bee larvae go through massive changes when they metamorphose into pupae. "It's hard to imagine what elements of the brain are influenced during the larval period that then survive the massive reorganization of the brain to bias behavior in this way," said Gene Robinson, lead researcher.

Immune responses also seem to be affected by how aggressive bees are: the bees from gentle colonies had weaker immune responses than did those from tough hives. In particular, the aggressive bees showed stronger resistance when exposed to pesticides: "surprising considering what we know from vertebrates, where stress in early life leads to a diminishment of resilience. With the bees, we saw an increase in resilience."

How does “social information” get transmitted to capped larvae? Could it be different feeding? The researchers checked whether the aggressive bees were bigger, thus perhaps better fed, but gentle and aggressive bees in the study proved to be the same size. Thus, there may be some kind of communication that takes place even to larvae, suggesting that honey bee sociality may be even more complex than we already thought it was.

To read more, visit: http://us1.campaign-archive1.com/?u=5fd2b1aa990e63193af2a573d&id=4846640e06&e=e9ff21e0bb

Above, African honey bees during honey harvest: “Apis mellifera scutellata” by Lorraine Beaman, USDA ARS Honey Bee Breeding Lab (license: public domain).

“Can African Honey Bees Help Stop Global Colony Losses?”: *World Economic Forum* via Fran Bach’s WSBA “Items for Beekeepers,” October 2015

How did honey bees get by before we humans came along to “manage” them? Could current questions about how to help bees deal with parasites and diseases be answered by looking at wild bees in places where bees have been far less managed – like Africa? International research teams are working to find out more about the estimated 310 million honey bee colonies in Africa – most living wild. The researchers are asking these questions:

• “Is it possible that by developing beekeeping to the current industrial level, we pushed the honey bees to their biological limits? When managing these pollinators, do we place them in such unnatural situations that they are weakened?”

• “Was the selective breeding used to improve desirable traits such as honey production or docility done at the expense of their defence mechanisms?”

• “Does the wide scale honey bee trade result in the spread of damaging pathogens to which the honey bees are not adapted?”

In South Africa, Uganda, Kenya, and Benin, studies show that the bees are doing well. Although Varroa mites are present, they have not made the terrible inroads that they have on European and U.S. bee colonies. If researchers can find out why, perhaps “[s]elective breeding of the responsible behavioral or physiological traits could help the currently susceptible populations survive in presence of the parasite. Control efforts of the past decades have not resulted in parasite eradication and new methods are required. Honey bees that can live in the presence of this mite without human intervention are the Holy Grail for many scientists and beekeepers.”

Above, “A Honey Bee takes nectar from a flower as pollen grains stick to its body in Tanzania” by Sajjad Fazel (license CC BY-SA 3.0)

However, “worrying signs of declining populations have recently been reported in Madagascar, Kenya and South Africa. This is where colonies succumb to the newly arrived varroa mite or where beekeepers have increasing difficulty trapping wild swarms to build their stocks.” Can African beekeepers avert first world beekeeping problems by studying what is going on with wild bees and new varroa susceptibility in the managed populations?

The interesting exception to Africa’s relative strong honey bee health rule is damage caused by a parasitic honey bee in the Cape region of South Africa. This bee reproduces by invading other subspecies’ hives and eating up their resources till the host colony collapses. South African beekeepers have lost “[t]ens of thousands of managed colonies . . . to this parasite, while the wild populations still living in natural nests fortunately seem spared.” The researchers suspect that something about how bees are managed leaves them more susceptible to being ravaged by the parasitic bees.

The parasitic bees represent one case study of what happens when trade displaces one bee subspecies from its “natural distribution range” and insert it into another. More broadly, “[t]he huge numbers of bees being traded all over the word exposes them to numerous diseases.”

To read more, visit: https://agenda.weforum.org/2015/10/can-african-honey-bees-help-stop-global-colony-losses/

"Bees love caffeine, too — and tricky flowers take advantage": ***The Washington Post,*** **15 Oct 2015.**

Bees crave caffeine – and some flowers' nectar contains it – but when bees get that caffeine fix, their foraging skills decline, to the detriment of their colonies. An earlier study showed that when honey bees were "exposed to caffeine, [they] could learn new flowers more quickly and remember them for longer periods of time." But researchers wanted to see whether this lab finding translated into more efficient field pollination. In this new study, they discovered that "[b]ees exposed to caffeinated nectar did indeed forage more often." However, they "checked their caffeinated flowers almost obsessively -- and did four times the usual number of dances to alert the rest of the colony to the flower's presence – [but] they ignored equally nutritious, decaf flowers."

Researchers were startled by how persistent the caffeine effect was: "if they just had one, three-hour exposure to the caffeinated nectar on the first day, they would come back [to the empty feeder] for many more days, and more often within each day." In contrast, "control bees -- the ones who hadn't had caffeine -- would check the flower they'd fed at previously, but would quickly move on to forage for food elsewhere."

Above, coffee flower: "Coffea canephora 1 at Aanakkulam" by Jeevan Jose, Kerala, India (Licensed under CC BY-SA 4.0 via Commons)

Not surprisingly, coffee plants' nectar contains caffeine. However, so does that of citrus and other plants. "This drugging effect helps explain why caffeine -- which plants put in their roots and leaves to turn off herbivores with the bitter taste -- also shows up in nectar, which is meant to be sweet and appetizing. Researchers had previously investigated nicotine in nectar for the same reason, but found that these plants actually used nectar bitterness to their advantage: Bees, repulsed by the bitter taste of the nicotine, would move more quickly from flower to flower."

Researchers say that this "caffeine addiction" doesn't actually hurt honey bees, since the bees still get nutrients from caffeinated nectar. The problem is that they forage less efficiently and miss better food sources that they could be bringing home to the colony instead.

"I think when people think about pollination, they think of the collaborative nature of it, the nice, sweet partnership of it," said Margaret Couvillon, lead researcher. "But as with many partnerships, there's potential for conflict. One side will always want to cheat the other if they could get away with it."

To read more, visit: https://www.washingtonpost.com/news/speaking-of-science/wp/2015/10/15/bees-love-caffeine-too-and-tricky-flowers-take-advantage/

"Study Finds Glyphosate and Acetamiprid to Have Relatively Low Toxicity for Honey Bees": ***American Bee Journal*****, 13 Oct 2015**

A new USDA-ARS and Mississippi State U study found that glyphosate, the active ingredient in Roundup, and the neonicotinoid pesticide acetamiprid did not kill bees in a "realistic field setting" test intended to find out how toxic 42 frequently deployed pesticides are. In the study, while 26 pesticides – including most of the neonicotinoids tested – killed "nearly all bees that came into contact with the test pesticide sprays" – the two common pesticides did not.

Sulfoxaflor, which the Ninth Circuit Court of Appeals banned earlier this year because of its impact on pollinators, came in "near the middle" and was "less toxic to bees than permethrin" (from the class of insecticides called pyrethroids, permethrin turns up in not only agricultural applications, but household uses like" flea shampoos for pets . . . and head lice products for people").

Other pesticides turned out to be more dangerous to bees than previously assumed: "methoxyfenozide+spinetoram, carbaryl, indoxacarb, and 1-cyhalothrin+chlorantraniliprole . . . were found to be higher risk when field-application concentrations were considered."

Above, "Crop spraying near St Mary Bourne - geograph.org.uk – 392462," by Brian Robert Marshall (Licensed under CC BY-SA 2.0 via Commons)

The study put bees into a simulated cotton-field-spraying situation, whereas earlier tests only looked at direct application of active ingredients or put pesticides into a sugar solution in artificial feeders, "none of which provide appropriate measures of the amounts of pesticide exposure in the field." (Editor's note: these discredited methods are how most tests that approved these pesticides were conducted.]

The study concluded: "Field spraying of insecticides and other pesticides may effectively kill insects, including valuable honey bees, and the risk to honey bees can be reduced by selecting pesticides with lower toxicity in field applications. This study determined that a number of pesticides, including a neonicotinoid, showed little to no toxicity to bees, meaning they could be effective alternatives to organophosphates, carbamates, and other neonicotinoids."

To read more, visit: http://us1.campaign-archive2.com/?u=5fd2b1aa990e63193af2a573d&id=f9f6385be2&e=e9ff21e0bb

"Can Bees Fly in the Rain?" ***Bayer Bee Care Center*****, 27 July 2015**

An Ohio farmer asked Bayer Bee Care Center about how rain affects bees' pollinating capacities. Does rain ground bees?

Bayer referred readers to DreamWorks's animated Bee Movie, whose hero bee is driven by a rainstorm to shelter in an apartment. While "Bee Movie," like many cartoons, gets a lot of bee biology wrong, this piece, evidently, they got right. Bees in the hive won't emerge while it's raining. They even avoid flying in mist, which "can easily cover a bee and interfere with its flight aerodynamics. Bee flight muscles typically beat 12,000 times per minute, and mist can impede these wing beats. In addition, water can accumulate on the bee's hairy body, becoming a weight issue." During a heavy rain, big drops whack flying bees and knock them down to earth. Finally, "rain clouds can block the sun and may interfere with bee navigation, as well as reducing solar radiation, which can help heat up flight muscles. The coolness of the rain water also can lower the bee's body temperature and impede activity, including flight." Bees caught outside in a storm will try to find shelter and go home to the hive when the rain ends. "Interesting fact: Firefighters use a wall of mist to control bee flight and protect rescue workers when bees are spilled on highways when trucks transporting hives of bees for pollination accidentally tip over."

To read more, visit: https://www.bayercropscience.us/news/blog/2015/july/072715-you-ask-we-answer---can-bees-fly-in-the-rain

Above, "Iris and Bee in the Rain," by Tony Hisgett (License CC BY-SA 2.0

ANNOUNCEMENTS

Annual Beekeepers' Ball, November, Jacksonville, Oregon: Saturday, November 14th:

To celebrate another year with bees and raise funds for the Bee Girl organization, guests are encouraged to come as a bee, a beekeeper, a flower, or dress to the nines in yellow and black. Bee Girl is a nonprofit with a world-wide presence on a mission to inspire and empower communities to conserve bees and their habitat. Funds raised will enable Bee Girl to continue to conserve our bees by educating the public on their importance through our programs focused on community classes and events, public education, our Kids and Bees program, and our Farming for Bees initiative. The night will feature food, drink, and wing buzzing tunes by Eight Dollar Mountain, and winners of the 2014 Northwest String Summit, Left Coast Country! We are also excited to welcome Jefferson Public Radio's Dave Jackson as our emcee!

Buy your tickets online here: www.universe.com/beekeepersball. For more info, visit: https://www.universe.com/events/the-4th-annual-beekeepers-ball-tickets-jacksonville-XGP96W

Local Honey is Still Available: Visit our website, click on Honey, then on "Buy Local Honey." If you're an LCBA member who is selling your honey, let Susanne know to be listed on the site.

BEE INFORMED: Help Bee Research by Joining HiveCheck & Taking a Monthly Survey – Free, with access to HC Resources

From BIP: "The Bee Informed Partnership invites you to check out our latest program for backyard beekeepers, BIP's HiveCheck Program. Every two weeks we're sending hundreds of beekeepers across the country a short 10 question survey asking how they are managing their colonies to share management practices with each other. At the end of each week we send a detailed report of all the responses to our participants including filters to see management trends by region and even by state for premium members! Join Us Today By Signing Up For A Free National Report Membership! If you like you can also sign up for our premium membership to Support Bee Informed's research and receive more detailed reports. We hope to see you sharing your management practices with us and the nation!" – The Bee Informed Team

To read more & sign up, visit: http://www.beeculture.com/catch-the-buzz-bips-new-hivecheck-2-0-regional-survey/?utm_source=Catch+The+Buzz&utm_campaign=8ad9dac5ac-Catch_The_Buzz_4_29_2015&utm_medium=email&utm_term=0_0272f190ab-8ad9dac5ac-256261065

Webinars from American Beekeeping Federation: Primetime with Honey bees: Beekeeping, Honey Bees and More!

Wednesday, November 11, 2015, 7:00 p.m. PT; please visit our ABF website at http://www.abfnet.org/ for more information and to sign up.

SESSION DETAILS: ABF Vice President Gene Brandi shares challenges that beekeepers face and the effects of pesticides on the honey bee population. Beekeepers are losing 30-50% of their hives each year, so this is a pressing issue for all who are interested in the population. Gene will update us on everything that ABF board members and leaders are doing to help reverse the trend, and provides insight into how everyone can lend a helping hand. Register Now at https://attendee.gotowebinar.com/register/1743910472247926530

Western Apicultural Society Newsletters: http://groups.ucanr.org/WAS/WAS_Journal. Click on the line in the paragraph on the right as directed. If you're still getting the old issue, click on "empty cache" in your browser or "refresh" or "reload" under VIEW in your menu bar.

WSBA Newsletter: Pick up your copy online at www.wasba.org: click on "Newsletters."

That's all for now ~ take care, & bee happy!

~~ Susanne Weil, LCBA Secretary (Susanne.beekeeper@gmail.com; 360 880 8130)