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December 2018 / January 2019 LCBA Newsletter

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Questions? Suggestions? Resources you'd like to share, stories you'd like to tell? Please contact LCBA Secretary Susanne Weil: secretary@lcba.community or call 360 880 8130.



UPCOMING EVENTS

Saturday, January 5:

Getting Started in Beekeeping

When: 10 a.m. to noon; Where: Centralia College, Washington Hall 103

What: Do you have friends who are interested in keeping bees, but not quite sure what's involved? Please tell them about this free orientation! No preregistration required. LCBA beekeeping instructors Peter Glover and Susanne Weil will cover benefits of beekeeping, "bee biology 101," equipment needed, how to set up your apiary, what beekeepers do over the course of their first year, getting and managing bees, harvesting honey, parasites and diseases, & preparing for over-wintering.

This Orientation is also a preview of LCBA's Beginning Beekeeping Class ~coming this January & February (see below) - offered through Centralia College's Continuing Education Program. Questions? Call 360 880 8130; email secretary@lcba.community

Thursday, January 10

"History of Pesticides: What It Means for Honey Bees"

Speaker: Bryan Castro, Bryan's Bees

Where: Centralia College, Walton Science Center 121; 701 W. Walnut St., Centralia WA 98531.

When: Social Time 6 to 6:30 p.m.; Speaker, 6:30 to 7:30; Business Meeting & Beekeeping Q&A, 7:45 to 8:45 p.m.

What: Ventura County, California is one of the agricultural hotspots of the world, & has been one of the biggest beekeeping counties in the country. Bees & pesticides have coexisted successfully since 1876, but change is in the air. New insecticides, fungicides, & herbicides are being developed, & CCD is now so prevalent that some beekeepers are seeing a 100% loss rate within their apiaries. In some locations entire apiaries have been lost within two weeks.



Above, right, Bryan Castro of Bryan's Bees, Chehalis, will be our January 10 speaker.

Bryan will talk about the history of pesticides, types of insecticides, responsible farming practices, & how to keep bees safe. Bryan owns Bryan's Bees & founded the Ventura County Beekeeping Club. Bryan worked in the Pollination Ecology Lab & Entomology Lab at California State University Channel Islands. After college Bryan worked in agricultural pest control, commercial beekeeping, & residential pest control before starting his own beekeeping company in 2012. Bryan's Bees specializes in live bee removal & uses all rescued bees for their pollination, honey, & queen rearing operation across California and Washington.

6 Saturdays, January 12, 19, 26, February 2, 9, 16, 9 a.m. to noon

LCBA's Beginning Beekeeping Course: "Your First Year in Beekeeping"

For details, visit <http://lewiscountybeekeepers.org/education>



Above, scenes from LCBA's 2018 Beginning Beekeeping class: left, Kevin Reichert & Dan Maughan teaching a lesson; right, Josh Smith & youth scholarship students Austin Nelson & Caleb Smith tasting honey during a class break.



Saturday, February 9

WASBA Conference, Cheney WA

After a gap of several years, the Washington State Beekeepers' Association is once again holding an annual conference in 2019. The Keynote Speaker will be Sarah Red-Laird, founder and executive director of the Bee Girl Organization. There will be scientific presentations by Jerry Bromenshenk, Brandon Hopkins, and more; there will be presentations designed for hobbyists, such as mead-making and over-wintering. Other Program Highlights include a Vendor Fair featuring commercial and nonprofit exhibits, raffle prizes, including an electric extractor, and an after conference social.

To register and/or get more information, visit: <https://bit.ly/2RHBWky> Lodging information: Holiday Inn Express in Cheney: Call them at 509-235-1100 and mention the "Beekeeping Conference" group discount to receive a rate of \$109+tax in a Single King or Two Queen room. <https://wasba.org/reenergized-annual-conference-coming-february-9-2019>

Thursday, February 14

LCBA Monthly Meeting: DIY Beekeeping Projects by LCBA Members – Details in our February Newsletter ☺

Do you have a bee project you'd like to share? Please email secretary@lcba.community !

Notes from LCBA's November Monthly Meeting



Above, Drs. Jennifer Han and Nick Naeger; below, bee & assorted fungi



Using Fungi to Control Parasitic Mites and Honey Bee Viruses

Speakers: Dr. Jennifer Han and Dr. Nick Naeger

LCBA President Reichert introduced Drs, Jennifer Han and Nick Naeger from WSU, both of whom are researching how to control viruses transmitted by Varroa mites. These viruses dampen the honey bee's immune system, starting a feedback loop in which bees are less and less resistant to mites and viruses both. If we can control Varroa, we can help control viruses, and vice versa. However, chemicals have come and gone on the market and become ineffective as mites develop resistance. This led researchers to ask: is there a biological rather than a chemical solution to the varroa problem?



Fun with Fungi: above left, a large wild fungus; right, a hat made from a mushroom!

Fungi to the rescue: Mushrooms may hold a key to boosting honey bees' resistance to mite-borne viruses. Jennifer gave a short overview of mushrooms, both edible and inedible. Common soil-borne fungi are found all around the world, from forests to grasslands to swamps to deserts. Mushrooms have been used not only for food, but for medicinal purposes – for example, in China since ancient times. Jennifer said, “I love mushrooms and want everyone to love them!”

Metarhizium brunneum is the fungus that has shown great promise in helping bees resist Varroa-borne viruses. This fungus is entomopathogenic, meaning that it can act as a parasite of insects and kills or seriously disables them: see the “zombie fungi” photo below. It is native to Washington soils and can be used worldwide. The EPA has already approved metarhizium for insects other than bees, which they neither infect nor kill; they are also safe for human contact and consumption.



Above, “zombie” metarhizium fungus grows from dead insect’s body.

A hive experiment was done in Idaho to prove the concept: they grew the fungus on augur, a nutrient medium with nothing on it; they also used a medium with fungus growing on it, to see which state of the fungus could be most productive in killing mites. They just took a petri dish of fungus and put it between top box and lid on top of the frames with the bees doing their normal chores around it.

Results: when the colony was treated with metarhizium spores, there was a significant increase in the mite drop. To collect data, they took sticky cards and put these on bottom boards to count the fall of mites daily. The numbers of mites dropped substantially. Jennifer plated each mite separately and cultured it to see if fungus would grow out of a dead mite, as well as to see what killed the mite. On day 5 after application, they saw peak mite drop [called Varroa mycosis]: the main reason is temperature, – 4 degrees Centigrade v.s. 35 degrees Centigrade. In warmer weather, fungi don’t survive long – it’s just too hot for them. However, as we know, it’s warm in a bee colony anytime, so how could “thermotolerance” be developed in the fungus?

Developing thermotolerance in fungi so they can survive in bee hives: They applied directed evolution techniques to stress-induced conidia (spores produced asexually by the fungus) to develop thermotolerance. They used H₂O₂ treatment to provide osmotic stress; minimal media [food on petri] delivered nutritional stress. Now, two years later, they use what grew out of mite to treat the next generation of bees, and so on. Now, in generation four of this study, they have seen a big spike in mite kills, as well as the fungus lasting longer in the hive (from 9/24/17 to

11/8, as opposed to only from 7/2 to 7/29/17 in the first trial). After this, they generated fungi inside a lab with controlled temperatures. Basically, Jennifer and Nick have been able to develop fungi that tolerate heat better.

Metarhizium works to control mites: Colony longevity was better with the metarhizium plus extract than it was with only the control plus sugar, control plus extract, or metarhizium plus sugar. (As some of the data have not yet been published, we can't share numbers here.) This is a better long term solution than finding another chemical control agent: it is harder for a parasite to develop resistance to another living thing than to develop resistance to a chemical. Now that Jennifer and Nick have a USDA grant to continue this work, their next steps will be to recommend dosages and better ways to apply fungi to the hives. Hopefully in the next two years, they will develop a protocol for how to do this. For now, the next steps will be continued work on selection, delivery method, and timing, using strips, grease patties, and powders to deliver the fungi into hives every 4 weeks.



Above left, normal healthy bee; right, bee infected with Deformed Wing Virus

Meet the Viruses: Jennifer turned the podium over to Nick, who noted that 100% of hives of one apiary they sampled in California had Lake Sinai Virus (LSV). Nation-wide, many bees have Deformed Wing Virus (DWV). There are at least 23 known honey bee viruses, including such golden oldies as sacbrood, with DWV and LSV most prevalent. These viruses shorten bees' lifespan, spread easily, and take down bee population to the point where the colony is no longer sustainable. One common symptom of virus-infected bees is a greasy bee appearance (as in chronic bee paralysis virus, though Dr. Dewey Caron has noted that CBPV may not be vectored via Varroa).

How viruses infect bees: Honey bee viruses commonly afflict the bee gut and other tissues, such as ovaries, brain, and antennae. Bee poop can spread viruses, too, as can honey extracted from an infected colony. Viruses can get into the ovaries of the queen: as a result, offspring are born already infected by viruses. Queens born with DWV can't fly, and her colony will die out because she is not mated. Viruses are spread not only by Varroa, but through contact with other bees, mating, and foraging on flowers. "If you have neighbors with infected drones and you have a virgin queen doing mating flights, then, oh well," Nick said. Also, wild pollinators are testing positive for honey bee viruses: this includes bumblebees, wasps, leafcutter bees, sweat

bees, alkali bees, and more. This kind of inter-species transmission is called “host jumps.” Nick noted the possibility that viruses could mutate and become species-specific.

Varroa-virus complex: When Varroa mites feed, they inoculate the host bees with viruses; they seem to have a special symbiosis with DWV and other viruses. The bee immune system is suppressed at the cell level, so the virus wreaks havoc.



Above, bee foraging on wild mushroom

Wild pollinators forage on trees – and fungi: Insight has come through observing nature: Paul Stamets of Fungi Perfecti saw bees going after mulch and wondered why. He noted that wild pollinators will forage on fungi as well as the flowering plants we traditionally associate bees with. Trees and fungi have immune systems based on chemistry: when bees forage on tree resins, they bring back antimicrobial compounds back to the hive. Thus, foraging on fungi can help boost the immune systems of all bees in the hive.

Reducing viral impact through foraging on mushrooms: Bees may be doing similar things with mushrooms as they have been observed to do with trees: see the cage experiment results. They looked at polycore mushrooms, long-lived fungi (like 10 to 80 YEARS). These fungi will colonize an entire tree: it benefits them for that tree to be healthy. They want to live on it, not kill it. These antimicrobial compounds have been used as medicinal as far back as ancient China. With a higher dose of fungi, they found more virus reduction. Birch wood was colonized: it already had some fungus in it, which worked well. The change in viral level was significant: again, unpublished data can’t be shared here, but in rough terms, in the DWV v. LSV trials with small outdoor colonies in autumn, they saw an 80 fold reduction (LSV) and 144 fold reduction (DWV). For the LSV sample, the controls reduced viral levels 80 fold, but a 3 million fold reduction came later, as the fungi’s longevity in the hive increased.

In California almond trials with 532 colonies, they tested different fungal species, wood growth substrate, and doses. Bees were fed while in the almonds. Birch substrate proved better than alder substrate, depending on the fungus. They administered doses of 1% extract into normal syrup.

In caged studies of bee longevity, extracts of fungi were fed to bees via sugar syrup. Sugar-fed colonies died sooner; bees fed with *gammaderma* mushroom extract lived longer. There are now multiple data points saying that fungal extracts probably have an knock-down effect on viruses and mites.

The bees from Nick and Jennifer's study are now over-wintering in a WSU climate-controlled warehouse in Pullman.

Fungi Perfecti in Olympia is making fungi extract for human consumption: it is available now, and, though expensive, can help boost your immune system against viruses! They are trying to make it less expensive for application to bees. Hopefully in a year or two, treatment will be available. They are hoping that the regulatory process will not be slow.



Next steps: Jennifer and Nick are planning further investigation into how fungi extracts affect hive health and mortality in the long term, as well as effects on American Foulbrood, Nosema, and other diseases. They are also investigating qPCR for bee immune genes and pesticide resistance. (qPCR, according to Wikipedia, “is a real-time polymerase chain reaction, also known as quantitative polymerase chain reaction [qPCR]; it is a laboratory technique of molecular biology based on the polymerase chain reaction. It monitors the amplification of a targeted DNA molecule during the PCR, i.e. in real-time, and not at its end, as in conventional PCR.”) Will giving the extract boost bees' immune systems, as well as treat viruses? Would there also be synergy to protect bees from pesticides?

For those who'd like to read more about this research, Jennifer and Nick shared these links:

Seattle Times: <https://www.seattletimes.com/seattle-news/science/how-the-mushroom-dream-of-a-long-haired-hippie-could-help-save-the-worlds-bees/>

Scientific Reports: <https://www.nature.com/articles/s41598-018-32194-8>

Q&A: One member noted that birch on her property already has gannaderma fungi, so do bees forage directly on it? Nick thinks they likely do, especially when the fungi are first forming. He said that if you see the shrooms sweat, that's what the bees want - the exudate, the fluid - it is not sweet, so maybe the bees are self-medicating. Susanne asked about propolis: could it be that extracts from fungi in tree barks have already gotten into the propolis and contribute to propolis's known immune-boosting effects? Nick said that is possible, though he is not certain.

Dan Maughan was curious whether there is an association between fungus and temperature: the slideshow had photos of ants that were affected, and ants are sort of cousins to bees in that they're in the same order, hymenoptera. Why would they affect ants and not bees? Jennifer said that some fungi are very specific rather than generalist. Some fungi can kill honey bees, so they do not use a high dose. In their mix, they have not seen an increase in dead bees. They think this has to do with how bees work and how fungus works. Spores are infectious agents. When a spore

lands on the exoskeleton of insect and germinates, it needs to have contact with the cuticle. Honey bees are covered with hairs, and that may keep spores off their skin and up on top of their hairs so the spores cannot germinate on the bees.

Dan noted that he's observed yellowjackets, bees, and other insects going to fungi on a birch tree: he wondered if bees and others were smelling out these chemicals and going for them. Dan asked Jennifer and Nick's thoughts on cottonwood and big leaf maple. Nick said he has no idea but it's an interesting question.



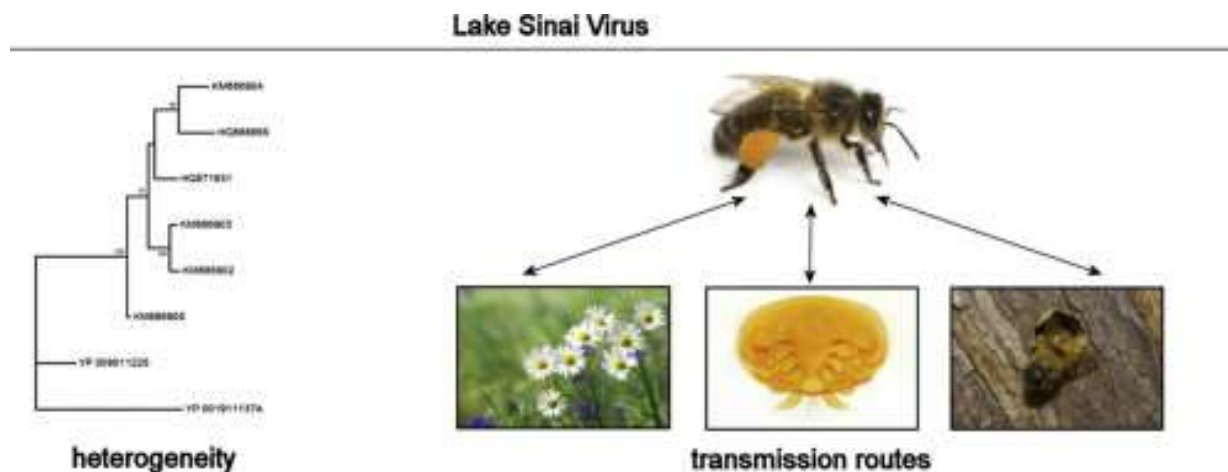
Above, Jennifer and Nick with the rest of the WSU-Fungi Perfecti research family.

Walt Wilson asked what the chemicals approved by the EPA are they designed to do: Jennifer said that they are for the same starting fungus, but for different purposes. The one approved for termites, Bioblast, is expensive. It isn't being sprayed in orchards for that reason. It's approved for termites and also for small-scale greenhouse applications. Question: would it help to have this in a pond where bees drink, so that the fungal extract would go through the bees' gut? Jennifer thinks that might not be as effective: bees, even larvae, seem to be immune to fungus. Kimo asked, "What about ground fungi?" Nick answered that bees do forage on that to some degree: he did not go into the details of the chemistry, but said the wood decay may produce chemicals that are also good for bees. Another study looked at pollen ingredients to boost the immune system, and these were also being produced by the wood.

Rick noted that garden giant mushrooms are easiest to grow: he grew them and then stirred them in with wood chips around the hive, so the fungus is exposed to the bees. Jennifer asked if they forage on it and Rick said that he has seen them do that. Also, she has heard reports of bees foraging on algae and packing in little green balls in their corbiculae (pollen baskets).

Another member asked about how fungal extracts might interact with fungicides: Nick and Jennifer have not looked at that yet, but they may. In the one case where they did look at fungicide, there was not a negative interaction. Hollowed out trees are partly hollowed out by fungus, so perhaps bees evolved to tolerate this. It's possible that microbial fungi in bee bread could be nutritional, but fungicide could then disrupt that.

Rick asked about Lake Sinai Virus: he read that this virus was at 100% infestation level, so even bees looking healthy have it. This was discovered in 2010 in the Midwest, and Rick wondered if Nick and Jennifer could tell us more. Nick said that it came from North Dakota, near Lake Sinai: someone was screening for possible pathogens early in the colony collapse era, and they found sick bees in North Dakota. They did a genomic screening and saw viruses not known: this led to the discovery of LSV. There are now variants of LSV: some strains are more virulent than others.



[Transmission of Lake Sinai Virus](#), from Science Direct.com

Deformed wing virus was actually in Hawaii before Varroa mites reached Hawaii: then the Varroa-borne version of DWV, which is worse, took over and wiped out the native DWV there. There could be waves of more infectious viruses coming. Nick is not sure if anyone is looking for native viruses in Australia, the last bee-habitable place without Varroa. Dan asked about extracts to put into a hive in terms of hive temperature and humidity. Is it good to regulate humidity on bees, as we do with moisture boxes? Nick said one study showed that humidity can be bad for mites, but other studies said ventilation helped. The ongoing work with CO₂ and Varroa may help: bees tolerate CO₂ well, but mites do not.

Rick asked if birchwood might be better than cedar chips in a moisture box? Possibly: Jennifer said that she has never seen fungi in cedar. It does not seem to infest it. Rick noted that, ideally, the chips would be dry.

Another member asked whether the bees' intestines had been sampled and tested before/after this research. Nick said no, but that he would be fascinated to see about that, because viruses change the gut of bees and cause developmental abnormalities in the gut. Dan asked about the white fungus on hay bales on his property: his bees are always all over it. Jennifer said straw is a good place to start propagating fungi.

Gordon Bellevue asked about holes bored in trees: in a story an acquaintance told him, this was done to accommodate all sorts of critters, but the only ones that would inhabit cedar were the bees. Another member noted having seen bees in oak trees often.

Pseudoscorpions - predators that just eat mites - live in trees: they need nooks and crannies to reproduce in, but a Langstroth hive doesn't have those. This can also be an argument to save the old growth forests: it takes time for those crannies to grow.

Kevin led the membership in thanking Jennifer and Nick for an extremely interesting talk and question session; Jennifer and Nick had to tend to their dog, waiting in the car, and head on to their next talk.

November Business Meeting Notes

Treasurer's Report: Treasurer Rick Battin reported that LCBA's checking account balance is \$5,210.97; the savings balance is \$5,001.78; and the Youth Scholarship Fund has \$2,216.57. Recent transaction: a speaker's stipend check for Dewey Caron in the amount of \$100 cleared.

Nominating Committee / LCBA Elections for 2019 – Update: Cody Warren reported that no one volunteered or was nominated for any of the open board positions. Per LCBA's bylaws, then the slate presented by the nominating committee is *de facto* elected: two year terms will be served by Bob Harris as Vice President, Peter Glover as Education Coordinator, and Susanne Weil as Secretary.

Community Outreach Update: Dan Maughan reported that the holiday potluck preparations are underway. Borst Park Kitchen #1 is reserved for Saturday, December 8. We'll start the festivities at 2 pm with a mead-making demonstration by Cody Warren. At 3 we'll have our social hour, followed by dinner at 4, and our youth scholarship presentations and fundraising drawing at 5. Dan encouraged members to donate bee-themed items (new or gently used) for the drawing. We called for volunteers to set up/tear down, and Steve and Cheryl Howard, Bob Harris, Mel Gregorich, Phil Wilson, Walt Wilson, Kay Crawford, Pamela Daudet, Cody Warren, and Susanne Weil volunteered. The club will provide meatballs and hams from Reichert's Distributing (one of these is donated by Reichert's Distributing).

Youth Scholarship Program/Education Program: Education Coordinator Peter Glover announced that the application deadline for 2019 is Friday, November 16 (postmark date) and asked members to help get the word out. Application forms and information are on our website: http://lewiscountybeekeepers.org/youth_scholarship_program/want_to_apply_2019_lcba_youth_in_beekeeping_scholarship_program_application_forms Also, we are holding two "getting started in beekeeping" orientations for those who are interested but not sure what kind of time and financial commitment is involved: Saturday, November 17 and Saturday, January 5; both are 10 a.m. to noon in Washington Hall 103 at Centralia College.

Mentor Program Update: Cody reported that mentors are working with mentees on feeding bees, candy board, mite control, cleaning entrances, etc.

Apiary Update: Cody reported that the bees are fed and so far nine hives are still alive. Go bees!

Bee-low, Cody examining a top bar frame at last May's workshop; right, members socializing post-workshop:



HIGHLIGHTS FROM LCBA'S 2018 HOLIDAY POTLUCK

A Mead Making Demonstration by Cody Warren kicked off our festivities at Borst Kitchen #1:



Above, left, LCBA members watching Cody's demonstration (photo, Phil Wilson); right, Cody adds honey to his mixture. The nice table décor was provided by Steve and Cheryl Howard.

Below, President Kevin Reichert, whom we happily welcomed back now that his health has improved, announced that our Community Outreach Coordinator, Dan Maughan, has had to step down from the board to free time for his growing beekeeping business and other commitments. Kevin thanked Dan for his years of dedicated service on LCBA's board, as Mentorship Coordinator as well as CO, and for his steadfast support of all our initiatives, from our course to serving as a mentor and hosting many workshops over the years. Kevin announced that Pamela Daudet has volunteered to serve the rest of Dan's term as Community Outreach Coordinator, and that the board is very pleased to appoint her, per the bylaws. All present thanked Pamela.



Above left, President Kevin addressing the membership; right, Pamela Daudet, our new Community Outreach Coordinator; below, scenes from the potluck:





Above, left, Caleb Smith, mentored by Mel Gregorich, and Austin Nelson, mentored by Dan Maughan, described their first-year beekeeping experiences to the members. Both had a lot of fun with their bees and felt they learned a great deal. They each were able to pull a little honey (and Caleb entered his in our annual contest and won a red ribbon). Austin's colony collapsed in the week prior to the potluck, but he and mentor Dan are going to investigate and diagnose the problem. Austin wants to go on with bees next year, maybe with a swarm; Caleb also wants to continue with bees. We hope to see them at our future meetings and workshops! Many thanks to mentors Dan and Mel for their work with our youth scholars.

Above, middle, at our Youth Scholarship fundraising drawing, Treasurer Rick Battin won a nice "honey for sale" sign; right, Vice President Bob Harris won an LCBA logo mug donated by Copy Depot/Precision Printing. Below, Alexi Pittman took home a (stuffed!) honey bear; Buck Duncan won a Vivaldi board donated by a member; and Gillian Davis won the 50 pound sack of sugar donated by Reicherts' Distributing.

Many thanks to all of our donors: gift certificates were donated by Beeline Apiaries, Reichert's Choice Meats, the Farm Store of Chehalis, Jeremy's Farm to Table, Shakespeare & Co. Coffeehouse and Bookstore, and the Tiki Tap (pizza) House; one of our potluck hams was donated by Reichert's Distributing; Dan Maughan donated several boxes of his hand-crafted woodenware; Steve Howard donated a screened bottom board of his design, as well as creamed honey; Bob Harris donated a freshly harvested turkey; and many brought other items to support our youth program – thanks to all!

Finally, thank you to our potluck volunteers – Steve and Cheryl Howard, Cody Warren, Walt Wilson, Phil Wilson, Mel Gregorich, Rick Battin, Kay Crawford, Pamela Daudet, Susanne Weil, and special thanks to Kevin and Jeanne Reichert for those meatballs!





Above, left, Cody Warren won headgear; middle, Cody's donated "My Bloody Valentine" mead, won by Secretary Susanne Weil (along with lovely metal-wrought bees donated by Peggy Hammer!); right, Grant and Dianne Inmon with their new LCBA logo travel mug. Below, some of our younger winners went home with Dan's beautiful lavender deep & frames, and a pretty "bee happy" mug (photos, Phil Wilson).



Business Meeting: We kept our business meeting brief so that folks could get to the Lighted Tractor Parade!

Treasurer's Report: Rick reported that our potluck's fundraising drawing raised \$462, bringing the Youth Scholarship fund to \$2,678.62. (In answer to a few inquiries since the potluck, Cody won the free-range, locally raised turkey donated by Bob and Sharon Harris for a bid of \$54.) Our checking balance is \$4,904.67: the only expense since the last report was \$56.30 to Kevin Reichert for ham and meatballs for the potluck. Our savings account balance is \$5001.90.

Youth Scholarship: Peter Glover reported that we have received two applications for 2019 scholarships which the board will review. If anyone knows a young person who might be interested, we would still accept the application if it arrives very soon. Peter also noted that if we

do not offer many scholarships this year, we can look into providing continuing education opportunities for youth scholarship alumni and possibly members.

Education Program: Peter reported that the November 17 “getting started in beekeeping” free orientation went well, though it was less well attended than in past years. Peter asked members to let friends interested in beekeeping know about the next orientation on Saturday, January 5, as well as our six-Saturday beginning beekeeping class through Centralia College Continuing Education, which starts on January 12 and is now open for registration.

Apiary Report: Cody Warren reported that nine hives are still alive in the apiary. They got hard candy before Thanksgiving and Cody is going to put on new candy boards the week after this potluck.

RECIPES OF THE MONTH

From the National Honey Board (honey.com)

Winter Honey Lox Toast

Ingredients (for 6 servings):

1/2 cup honey
 1 French country loaf,
 sliced into 1-inch slices
 10 ounce French brie cheese,
 sliced into 12 slices
 6 two-ounce slices of lox
 1 small red onion, sliced
 1/4 bunch parsley
 2 Tb. capers
 4 Tb. lemon juice
 olive oil
 salt to taste



Directions: Preheat oven to 350°F. Brush the slices of bread with the olive oil and toast in the oven for 8 minutes or until golden brown. While bread is toasting, mix red onion, parsley, capers, lemon juice and olive oil in a small bowl, season with salt and set aside.

When the toast is done, let it cool for about 2 minutes. Place 2 slices of brie on top of toast, followed by a 2-oz slice of lox and a tablespoon of the onion mix. Finish toast with a heavy drizzle of honey.

Chewy Honey Oatmeal Cookies

Listed as “most popular recipe” at Honey.com!

Ingredients (for 24 cookies):

1/2 cup butter or margarine, softened

1/2 cup granulated sugar

1/2 cup honey

1 large egg

1 tsp. vanilla extract

1 1/2 cups quick cooking rolled oats

1 cup whole wheat flour

1/4 tsp. salt

1 tsp. ground cinnamon

1/2 tsp. baking soda

1 cup raisins, chocolate or butterscotch chips



Directions:

In medium bowl, beat butter with sugar until thoroughly blended. Blend in honey. Blend in egg and vanilla, mixing until smooth.

In separate bowl, mix together oats, flour, salt, cinnamon and baking soda; blend into honey mixture. Blend in raisins or chips.

Drop dough by rounded tablespoonfuls onto greased baking sheet. Bake at 350°F for 12 to 14 minutes until cookies are golden brown.

Remove from oven and allow cookies to cool 2 to 3 minutes before removing from baking sheet.

Cool completely then store in an airtight container.

TIP: High altitude adjustment: Increase oats to 2 cups and decrease whole wheat flour to 3/4 cup.

Peppermint Candy Crisps

Ingredients (for 48 servings):

1/4 cup butter or margarine, soft
1/2 cup honey
2 oz. semi-sweet chocolate chips, melted
1 egg
1 Tb. milk
1 1/3 cups flour
1/2 tsp. baking powder
1/2 tsp. baking soda
1/4 tsp. salt
1/4 cup peppermint stick candy, crushed



Directions:

In mixing bowl, cream butter and honey until fluffy. Add melted chocolate. Mix well. Blend in egg and milk.

Sift together flour, baking powder, soda and salt. Add to creamed mixture and mix well.

Chill dough at least 30 minutes.

Drop by teaspoonfuls onto a greased cookie sheet about 2 inches apart. Press each cookie with bottom of glass coated with flour to flatten. Sprinkle each cookie with crushed peppermint stick candy. Bake at 350°F 8 to 10 minutes until done. Cool slightly before removing from cookie sheet. Cool on rack.

Microwave: Follow recipe directions. Drop by teaspoonfuls onto waxed paper or microwave baking sheet. Cook on HIGH: 6 cookies - cook for 1 minute, 15 seconds. 12 cookies - cook for 2 to 2-1/2 minutes. Cool cookies slightly before removing.

BEES IN THE NEWS

Thanks to Lisa Aldrich, Steve Arnold, Steve Norton, Sherri Underhill, Don Watt, Phil Wilson & the good folks at Bee Culture Magazine and American Bee Journal for these news stories.



Above, “Researchers say they've found a way to let queen bees pass on immunity to a devastating disease called American foulbrood. The infectious disease is so deadly, many states and beekeeping groups recommend burning any hive that's been infected. Here, a frame from a normal hive is seen in a photo from 2017.” (Photo by Bernadett Szabo/Reuters)

“World's First Insect Vaccine Could Help Bees Fight Off Deadly Disease”: National Public Radio, December 8, 2018: Researchers in Finland have invented a new edible virus to combat American Foulbrood, one of the bacterial diseases most deadly to honey bees. Although bees lack antibodies, they can transfer a heightened immune response to specific bacteria to their offspring. For details, visit: https://www.npr.org/sections/thesalt/2018/12/07/674587061/worlds-first-insect-vaccine-could-help-bees-fight-off-deadly-disease?utm_source=facebook.com&utm_medium=social&utm_campaign=npr&utm_term=nprnews&utm_content=203007&fbclid=IwAR3T62qfHaVATJWqNSyg3tFUqwdR22NKHQharSN76VzUDPQnJ5e1IZOFc2Q For the Finnish researchers’ own perspective, visit: <https://www.helsinki.fi/en/news/sustainability-news/the-first-ever-insect-vaccine-primebee-helps-bees-stay-healthy>

“USDA ARS Scientists unlock Small Hive Beetle Genome”: Bee Culture Magazine, December 19, 2018:

Good news for honey bees! Researchers at the USDA’s lab in Beltsville, MD have mapped the genome of the small hive beetle, a parasite that makes its home in honeycomb, lays its brood, and destroys the hive. Up till now there have been few treatments, Beekeepers and researchers will welcome the unveiling of the small hive beetle’s genome by Agricultural Research Service

(ARS) scientists and their colleagues. The small hive beetle (SHB) is a major parasite problem of honey bees for which there are few effective treatments: “[t]he SHB has a strong gene-guided system that lets the beetle detoxify many insecticides. Having the genome will allow researchers to gain a more precise understanding of these detoxification genes, so more effective choices for control treatments can be made. . . . This information will provide crucial keys that should lead to better, more targeted SHB control methods, including insecticidal treatments and possibly even genetic/breeding solutions.” To read more, visit: https://www.bee-culture.com/catch-the-buzz-usda-ars-scientists-unlock-small-hive-beetle-genome/?utm_source=Catch+The+Buzz&utm_campaign=b7a848b1b3-Catch_The_Buzz_4_29_2015&utm_medium=email&utm_term=0_0272f190ab-b7a848b1b3-256261065



Above, a sample of the havoc small hive beetles can wreak in a bee colony (USDA-Beltsville)

To see the actual SHB genome, visit:

https://www.ncbi.nlm.nih.gov/genome/annotation_euk/Aethina_tumida/100 : it has been published in *GigaScience*.

“Time-Release Miticide for Varroa Destructor in Bee Hives”: Michigan State University

Very hopeful news from MSU researchers: they may have found an effective Varroa treatment that isn’t toxic to honey bees: “MSU researchers have developed a technology that enables a time-release method for delivery of the miticide for a longer, more controlled treatment, which greatly reduces the risk of toxicity to the honeybee hive. This technology is a time release miticide compound, which slowly and naturally releases its active ingredients over time to treat mite infestations. The released active ingredients are environmentally benign and biodegradable. This product is designed to work within a honeybee hive over a period as long as 3 to 4 weeks, requiring fewer applications by the beekeepers. The slower release allows for a more controlled

treatment over incumbent products, which tend release most of their active compounds over the first few days at potentially toxic levels to the bees, especially at warmer temperatures. The long active period treats multiple mite breeding cycles, which improves control.” The researchers have applied for a patent and hope to be able to market the new miticide. For details, visit: <http://msut.technologypublisher.com/technology/23962> .



This Is How Amsterdam Is Helping Bees: Follow this link for a bee-autiful video that shows how the residents of Amsterdam came together to help support honey bees: thanks to Marcelle Stenzig for sharing this to our club Facebook page!

https://www.facebook.com/1MillionWomen/videos/563716590750524/UzpfSTgwMTUxMTM5OTkzMTYzNjoxOTY2MjI4OTQwMTI2NTM3/?notif_id=1546204630870735¬if_t=notify_me_page



“Sioux Honey to Showcase Who Their Honey Comes From, Co-op’s Campaign to Feature Local Beekeepers”: Bee Culture’s Catch the Buzz, December 21, 2018:

“Sioux Honey Association Co-op wants Americans to know who their honey comes from. That aim is the basis of a national campaign being launched today which features the faces and stories of local beekeepers across the country.

“Established in Sioux City, Iowa, in 1921, Sioux Honey Association Co-op distributes pure, “Product of the U.S.A.,” Grade A honey products including Aunt Sue’s, Sue Bee and Beek’s to retailers nationwide on behalf of its 270 independent beekeeper members.

““It’s not just where your honey comes from that matters. It’s who,” stated Rob Buhmann, chair of the co-op. “We know each of our 270 beekeepers by name. Whether they’re tending to hives in the Dakota prairies or on the Hawaiian Islands, our co-op members make decisions based on what’s best for our honey and what’s best for the families who buy our honey.”



Above, Darrell Rufer, one of the beekeepers featured in Sioux Honey’s campaign

“Amongst its 270 members, Sioux Honey Association Co-op selected beekeepers from Idaho, North Dakota, Minnesota, Arkansas, Michigan and California to be the faces of its “Who Does Your Honey Come From?” campaign. The beekeepers will be featured on Sioux Honey’s new website and in a nationwide ad which highlights the challenges of beekeeping and the persevering nature of America’s beekeepers.

““Sioux Honey is synonymous with quality and with values,” said Darrel Rufer, a Minnesota beekeeper featured in the campaign. “I know a lot of Sioux Honey members, and they’re all the same. It’s not about seeing how much money you can make, or how fast. Beekeeping is not big agriculture. Beekeeping is big families. A lot of brothers, sons, dads, grandfathers. That’s why it’s a generational thing. It’s a lifestyle.”

“Beyond introducing local beekeepers, the co-op is advocating for consumers to look at the label when buying honey, know who and where it comes from, and keep an eye out for both the “Grade A” and “Product of the U.S.A.” designations. “Grade A” is the highest grade awarded by the UDSA and “Product of the U.S.A.” is a guarantee of the country of origin. Combined, the labels confirm honey is pure, with nothing added, and of the highest quality, according to Buhmann.

““Bootleg honey – usually originating from China – is an unfortunate, yet real, concern today,” Buhmann said. “When you pick up ‘Grade A,’ ‘Product of the U.S.A.’ honey, you don’t have to wonder about the quality or who it came from. You know what you’re getting.””

<https://www.bee-culture.com/catch-the-buzz-sioux-honey-to-showcase-who-their-honey-comes-from-co-ops-campaign-to-feature-local-beekeepers/>



**“Researchers Discover Honey Bee Gynandromorph with Two Fathers and No Mother”:
Bee Culture, December 14, 2018:**

A fascinating look into the biology of honey bee reproduction by Bob Yirka of Phys.org:

“A team of researchers at the University of Sydney has discovered a honey bee gynandromorph with two fathers and no mother—the first ever of its kind observed in nature. In their paper published in the journal *Biology Letters*, the group describes their study of honey bee gynandromorphs and what they found.

“Honey bees are haplodiploid creatures: females develop from fertilized eggs, while males arise from eggs that are not fertilized. Because of this, honey bees are susceptible to producing gynandromorphs, creatures with both male and female tissue. This is different from hermaphrodites, which are one gender but have sex organs of both male and female. In this new effort, researchers sought to learn more about the nature of gynandromorphs and what causes them.

“Prior research has suggested the likelihood that rare mutations result in the creation of gynandromorphs. The mechanics of the process are due to multiple males mating with a queen, resulting in more than a single sperm fertilizing an egg. To learn more about the genetics involved, the researchers captured 11 gynandromorph honey bees, all from a single colony, and studied their genome.

“The genetic makeup of the gynandromorphs revealed that five of them had normal ovaries, while three had ovaries that were similar to those of the queen. Also, one of them had normal male sex organs while two had only partial sex organs. The researchers also found that out of the 11 gynandromorphs tested, nine had either two or three fathers. And remarkably, one had two

fathers but no mother—a development that could only have occurred through the development of sperm fusion.

“The researchers note that gynandromorphs confer no known evolutionary advantage for a species; thus, their development must be due to mistakes resulting in still unknown mutations. They suggest that the large number of gynandromorphs in a single hive likely means the queen carries the mutation. They note that gynandromorphs have been observed in other species as well, including some crustaceans, other insects and a few bird species. The mutation that causes it in those other species has not been found, either.”

Read more at: <https://phys.org/news/2018-11-honeybee-gynandromorph-fathers-mother.html#jCp> . For Bee Culture’s original article, visit: <https://www.beeculture.com/catch-the-buzz-researchers-discover-honey-bee-gynandromorph-with-two-fathers-and-no-mother/?fbclid=IwAR0s73qz8geShhWxta3xHY7u1CIJC1QjPSryR8gAdU5QUFX4GZdN77Es6w4>

ANNOUNCEMENTS

Also see “Upcoming Events”

Used Bee Equipment For Sale: Harold Weaver of Beeline Apiaries writes, “One of my customers is getting out of the beekeeping hobby. His health is making it difficult for him to take care of his bees. He has used beekeeping supplies and some new items that he would like to sell to anyone interested. His name is Leon Smith; phone number - 360-943-3108. He lives just north of Littlerock along Littlerock Road.”

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.

WASBA Newsletter: Pick up your copy of this bimonthly online at www.wasba.org: click on "Newsletters."

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

~~ Susanne Weil, LCBA Secretary (Secretary@lcba.community; 360 880 8130)