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FEBRUARY 2017



W.A.S.

Journal

Journal of the Western Apicultural Society of North America



Joe Carson's dog team beds down for a 4 hour rest during training for the 975 mile Iditarod Trail Sled Dog Race from Anchorage to Nome, Alaska in Feb-Mar. Joe likes to put his hives in these areas in summer because the fireweed is thick for excellent honey. And yes, the dogs get bee products in their diet to improve health and stamina. Photo taken between Christmas and New Years - not much snow for late December.

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¹Charistos, L., Piazos, N. & Hatjina, F. (2015) Long term effects of a food supplement HiveAlive™ on honey bee colony strength and Nosema ceranae spore counts, *Journal of Apicultural Research*
²Increase in honeybee populations with continued use of HiveAlive™, Results from long-term field trials, France 2014-2015, Trial conducted by Veto-pharma, France.



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PRESIDENT'S MESSAGE ...

2017 Winter

Unlike the past half-decade, this winter in California has begun surprisingly rainy. Severe flooding has not been a problem, yet, but local streams are reaching their banks (many are dry during the summer). From a beekeeper's point of view, we welcome the rain. If the rain recharges the soil adequately, then the plants that we depend upon for nectars and pollens can bloom well into the year. Otherwise our beekeepers have to feed their colonies as early as April, and periodically throughout the rest of the year.

I came into this presidency rather abruptly, so some decisions had to be made quickly. I have reserved a spacious room on campus for housing the general sessions, vendors/exhibitors, and banquet for the 2017 WAS Conference. I am completing the process of appointing various folks to help with the committee work. I also appointed individuals to fill the vacancies among state directors.

Now I am beginning to develop a presentation schedule that will include a little something for everyone. On our Entomology Department faculty we have three individuals working directly on honey bee-related topics: Dr. Brian Johnson who is working on molecular studies; Dr. Elina Niño who is conducting research on Varroa control products and some pesticide issues; and Dr. Rachel Vannette who is following the succession of microbial turnover in flower nectars as the bloom period progresses. I find those studies intriguing, since I tend to think that honey bees can pick up all the microbes of importance to them while foraging for water, nectars, and pollens. Besides obtaining major and minor nutrients, that is one of the reasons why a substantial mix of different pollens is so important to bee health.

Speaking of bee health, we have a very active native bee program in place, sharing the bee biology facility with the honey bees. Dr. Neal Williams has been very adroit as a grants man, and has built up a really strong program geared toward determining which bee species may be of assistance (or become the pollinator of choice) for some California crops. Commercial use of those bees would require the establishment of specific habitats on a substantial portion of a grower's property. To keep the native bee populations stable also would require conversion of large spaces to native bee habitat, as well. Since honey bees tend to willingly "share" many nectar and pollen-producing plants in an area, native bee plantings should help honey bees considerably, too.

You cannot catalog useful information about bee-plant interactions until you are sure of which bee you are watching. Dr. Robbin Thorp worked tangentially on native bees when hired as an apiculturist in the 1960s. Once retired and granted Emeritus status, Robbin plunged into native bee work with a vengeance. He identifies bees for the local native bee studies and also for researchers around the world. He is particularly interested in bumble bees and just co-authored a couple of books in that area of expertise.

I anticipate that most of those faculty members will be participating in the upcoming conference. I will leave what they will be presenting up to them. But, I have already cemented down our lead-off speaker. Serge Labesque originally kept bees in France. When he came to the U.S. he sought a location that would be similar to that which he left, and settled down in Glenn Ellen in California's wine country. Serge is an immaculate beekeeper – everything clean, neat, and tidy. He and I are good friends, but we have a few differences of opinions about beekeeping. I respect his opinions for desiring to select from local stocks of bees that can handle all the problems we throw at them. And he reluctantly admits that commercial beekeepers do need to do certain things to keep their bees alive. However, Serge has organized a terrific presentation on the natural, seasonal growth and decline of a healthy honey bee colony population living in a hollow tree. Please pay attention to all the details in his presentation. They will help you do a much better job of keeping bees, no matter how you do it.

My plans include having the group off the central campus for a couple of half days. We will need to form a caravan of personal vehicles to move everyone around. Also, those without wheels will have to find some empty passenger seats to get to the events. Don't worry! All beekeepers are slow, cautious drivers – at least when they are hauling bees.

I am looking forward to seeing you early in September.

Eric Mussen

WAS President 2017



2017 President Dr. Eric Mussen

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- 1980 Randy Barker (Br. Columbia)
- 1981 Charles Duncan (California)
- 1982 William P. Nye (Utah)
- 1983 John Edwards (Washington)
- 1984 Eric Mussen (California)
- 1985 Mike Burgett (Oregon)
- 1986 Doug McCutcheon (British Columbia)
- 1987 Tom Muncey (Nevada)
- 1988 Dan Mayer (Washington)
- 1989 Stan Williams (California)
- 1990 Mark Shelton (California)
- 1991 William P. Nye (Utah)
- 1992 Mike Burgett (Oregon)
- 1993 Mark Winston (Br. Columbia)
- 1994 James Bach (Washington)
- 1995 Eric Mussen (California)
- 1996 Russell Messing (Hawaii)
- 1997 Eric Erickson (Arizona)
- 1998 Steve Sheppard (Idaho)
- 1999 Leonard Joy (Nevada)
- 2000 Fletcher Miller (Alaska)
- 2001 Mike Burgett (Oregon)
- 2002 Eric Mussen (California)
- 2003 Jaquie Bunse (British Columbia)
- 2004 Jerry Bromenshenk (Montana)
- 2005 Steve Sheppard (Washington)
- 2006 Adrian Wenner (California)
- 2007 Diana Sammataro (Arizona)
- 2008 Mark Pitcher (British Columbia)
- 2009 Eric Mussen (California)
- 2010 Dewey Caron (Oregon)
- 2011 Jenny Bach (Hawaii)
- 2012 James K. Smith (Washington)
- 2013 Melanie Kirby (New Mexico)
- 2014 Jerry Bromenshenk (Montana)
- 2015 Beth Conrey (Colorado)
- 2016 Ethel Villalobos (Hawaii)
- 2017 Eric Mussen (California)

2017 WAS T-shirt design competition

Mid-winter is a somewhat odd time to be thinking about T-shirts. However, if we wish to come up with an artful design for our 40th anniversary conference, what better time to work on it than during cold, damp winter days?

Since we do not have a design in mind (other than displaying that it's the 40th Anniversary WAS Conference, in Davis, CA, in 2017), I am asking WAS members, and anyone else who feels so inclined, to submit their designs to my T-shirt contact person, Nancy Stewart. Nancy has sold large volumes of custom shirts through her bee supplies store and she will be the final judge (although I'm pretty sure she will ask for a little input from the Executive Committee) for design selection. Nancy's contact address for design submissions is: Sacramento Beekeeping Supplies, 2110 X Street, Sacramento, CA 95818.

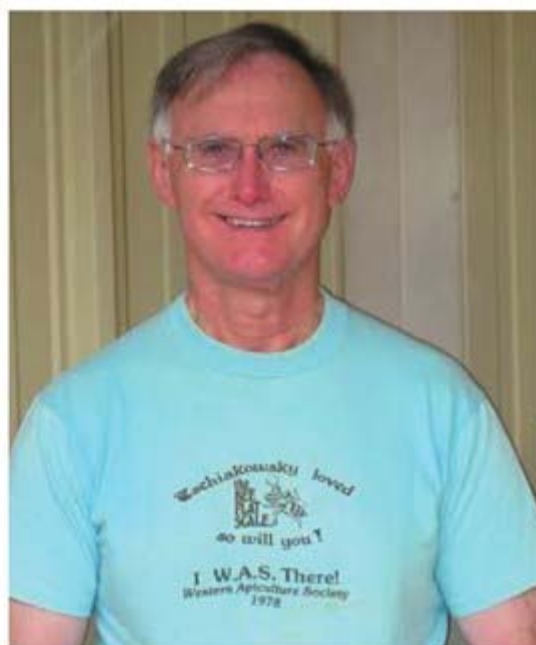
Don't worry about the details or "how good it looks." We take the selected design and pass it on to a T-shirt printing shop that has its own artists who "work up" the design for our final approval before any ink hits the fabric.

I'm not going to push for a particular submission format, but if the design pretty well fills an 8.5 X 11 inch sheet of paper, that's about right. If it is to be in color, please try to get the colors on the design.

We have only two more WAS Journals coming before the conference. The submissions have to be in Nancy's hands by March 1, 2017 to be considered (the sooner, the better). That will give us about four weeks to review and accept the final art and to be able to share the design with you in the April and July WAS journals.

We also will include the registration form in the April and July issues of the journal.

T-shirts have been part of WAS from the beginning, with only a few gaps early on. We have an almost-complete set of them among our memorabilia. Contact the WAS Journal editor if you have: 1983 (WA), 1984 (CA), 2000 (AK), 2003 (BC), 2004 (MT), 2005 (WA), 2006 (CA), 2007 (AZ).



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Why there will be no bee beards at WAS 2017!

Everything changes in time! At past WAS meetings the Bee Beard event has been a favorite activity. Many WAS members have won medals that signify that they belong to the "Royal Order of the Bee Beard". Now it's time to give some serious thought to this event as we approach the 2017 WAS meeting at UC Davis. Here is a recent letter I sent to our current WAS President, Dr. Eric Mussen.

Norm Gary, first WAS President

Hi Eric: I don't know if you are considering the usual bee beard event at the upcoming WAS meeting. If so, here are some thoughts that you may want to consider.

I have mixed feelings about encouraging beekeepers to engage in clustering bees on humans or animals as a means of generating publicity or just having fun at various meetings. This is an attractive and entertaining adventure, especially for those who have never had the experience. As you know, I have entertained in this mode professionally for more than 40 years as a Hollywood stuntman making bees perform under every imaginable circumstance. In one instance I clustered a million bees on 6 UC Davis cheerleaders in a pyramid! I also did hundreds of performances of my Thriller Bee Show on a mobile stage at fairs and festivals. These experiences gave me new perspectives that most people never have the opportunity to experience or even to imagine. Despite these experiences I still made mistakes that were far more serious than I recognized at the time. More than a half dozen times I inhaled bees and was stung in the throat and mouth. I always feared getting stung in the eye! I worked with movie stars, casts, and crews under circumstances that I would never repeat today in our extremely litigious contemporary society. Some of these people were hypersensitive to bee venom and I never knew how many or how sensitive they were. And neither did they! When filming Fried Green Tomatoes the head photographer received a single sting, passed out with the awful symptoms of anaphylaxis in a remote farming area many miles from medical help. Fortunately I saved his life by insisting at the outset that a licensed medic must be in the crew to administer epinephrine. He didn't know he was allergic to bees and thanked me profusely for discovering his allergy because he frequently filmed under circumstances where he could have been killed. Lots of things can go wrong in bee clustering activities, even under the supervision of an expert. Sometimes people get excited and do weird things that cause accidents. The important point I want to make is that anyone associated in any way with a bee clustering event can be sued for big bucks when things go wrong.

Bee stunts that are created and executed professionally for entertainment purposes in movies, TV shows, and commercials, are performed in an altogether different situation than stunts performed at amateur events at beekeeper meetings. Professional bee stunts are necessary to make movie scripts come to life. They are conducted by professionals who are highly trained, know the risks, and are protected by insurance and high priced attorneys to make sure all operations are safe and free from litigation exposure. Contrast this with bee stunts at beekeeper meetings where relatively inexperienced beekeepers place bees on people who have no, or limited experience, with bees on their bodies.

Aside from the extensive, unrecognized risks involved in amateur bee clustering events, we should pay more attention to the reactions of the general public after viewing such events, either live or on TV. What messages are we sending? I would wager that the average viewer concludes that beekeepers are crazy people to exhibit such bizarre behavior! Media people love to photograph bee cluster events because they know that they will get reactions from TV viewers. But what do viewers think of beekeepers, and beekeeping in general, when they see events where people get covered with bees for no reason other than to experience the adventure? I don't know of any research studies concerning the typical reactions of TV viewers to bee clustering events. How could we possibly expect positive results such as teaching viewers about the benefits of beekeeping to our society?

As you know, I did bee clustering in public places for years with my Thriller Bee Show performed in my mobile stage but 1) all bees were confined in a transparent chamber, 2) I clustered them on myself only, and most importantly 3) the audience had to listen to my half hour educational lecture before I performed the bee clustering action.

Here is the big question in planning our next WAS meeting. Should we support/encourage this extremely risky activity, potentially creating videos and pictures that appear to be detrimental to the image of beekeepers as well as the beekeeping industry? Please give these ideas some serious thought before committing to this event in the upcoming WAS program.

If a decision is made to have the bee cluster event, please at least get the advice of the appropriate attorneys inside and outside of the UC system. This could be very expensive and doesn't necessarily provide complete legal protection.

Eric, I think we should invite WAS members to suggest activities that could be substituted for the bee beard event. Bee beards were fine and fun in the old days but we live in a different world now. As I said at the beginning, everything changes in time.

Cheers, Norm

More



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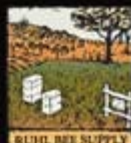
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February 2017 11



Hi Norm,

Thanks for the "Bee Beard" advice.

Personally, I have never worn a bee beard. I have assisted you and others participating in such activities, but I put bee beards in the same category with bull fighting. I wouldn't do it myself, and I see no reason for anyone else doing it, either.

Yes, I already have had persons contacting me to get bee bearding back onto the WAS agenda (we used to bestow "Royal Order of the Bee Beard" medals to the participants). Even though we will be spending a large portion of one day at BBF, I am not inclined to have that activity on the list. You just cemented my inclination.

If you are still planning to give us a "media night" presentation, you can mention why we didn't have bee beards in 2017, even if they are seen as part of your show. *Eric*

Varroa Mite Guide now includes IPM Videos

Dewey M. Caron, WAS rep to Honey Bee Health Coalition

The Honey Bee Health Coalition has released a series of videos to help beekeepers promote colony health and combat costly and destructive Varroa mite infestations. The videos provide detailed step-by-step instructions on how to monitor hives for Varroa and safely treat when levels get too high. The videos complement the Coalition's wildly popular Tools for Varroa Management Guide: <http://honeybeehealthcoalition.org/Varroa>. Dewey Caron, WAS representative to the Coalition, is principle author of the Tools and co-wrote and directed the video scripts, filmed at Foothills Apiary in Colton, Oregon.

"The Honey Bee Health Coalition's Tools for Varroa Management Guide has provided beekeepers in the US and Canada with invaluable tools and techniques to confront destructive Varroa mite infestations," said Mark Dykes, Apiary Inspectors of America. "These videos will show beekeeper real world application techniques to help correctly apply treatments." Mark was on-camera in the video taping. Website to watch the videos: <http://honeybeehealthcoalition.org/Varroa/#videos>.

The videos provide helpful visual aids and step-by-step directions on how beekeepers can monitor and control Varroa mites through an Integrated Pest Management strategy. Both the videos and Tools Guide cover a range of strategies and tools, including the uses of oxalic acid, formic acid, essential oils, other synthetic miticides and non-chemical treatment options.

"Healthy bees support our world's food supply and farmers everywhere. A single untreated colony can transmit Varroa mites to other nearby hives and threaten honey bee health across large geographic regions," said Danielle Downey, Project Apis m, the second on-camera individual on the videos. "Beekeeping is becoming very popular, and often keeping the bees healthy is a mysterious learning curve. These important 'how to' videos bring the Coalition's Tools for Varroa Management Guide to life — and will amplify its impact in the United States, Canada, and around the globe."

The Coalition's Tools for Varroa Management has given beekeepers the tools they need to measure Varroa mite infestations in their hives and select appropriate control methods. The guide, which has been downloaded

more than 5,500 times since its release, is the newly released 5th edition. The videos are embedded within the guide for easy download. There is also a new spreadsheet for easy record keeping of your varroa management included. Spreadsheet <http://honeybeehealthcoalition.org/varroa/> can be separately downloaded.



**HONEY BEE
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New rules for antibiotics use in beekeeping

Dr. Eric Mussen

Beginning January 1, 2017, regulations controlling use of antibiotics for honey bee colony treatments changed significantly. There no longer is the option to drop into the beekeeping supply store or animal feed store and pick up the antibiotic without a prescription (unless some company decides to formulate a product containing an antibiotic under a "Veterinary Food Directive"). Then you might find it on the store shelf, but you still will need to have a veterinarian's prescription to purchase it.

So, the first step is for the beekeeper (client) to contact a veterinarian who is willing to join you in a "veterinary client patient relationship" (VCPR). That means that the veterinarian is willing to come out to your place of business and be shown how and why the antibiotics might be needed for the bees. The veterinarian is going to have to be able to diagnose bee diseases if he or she intends to write a prescription.

There are two types of prescriptions. The first one, a VFD, is for pre-formulated products like the old tetracycline mixes used to be. This approach is going to be a bit of a hassle, since a "veterinarian, client, distributor" chain has to be set up and there are time limits on using the product once you purchase it.

The second approach is simply a straight prescription. That will allow the beekeeper to obtain the raw antibiotic and treat the bees in an allowable fashion. If no restrictions are written on the prescription, then the beekeeper must follow the label instructions on the product packaging, if there are any. Otherwise the beekeeper basically can use it as he or she has previously.

If there are treatment instructions written on the prescription, they must be followed exactly. For instance, the FDA suggested the following for treating with tylosin: "Amount 200 mg/colony in confectioners powdered sugar. Mix 200 milligrams tylosin in 20 grams confectioners/powdered sugar. Use immediately. Apply (dust) this mixture over the top bars of the brood chamber once weekly for 3 weeks." The idea here is to prevent tylosin, a persistent antibiotic, from being blended with nectar and other syrups and winding up in the honey.

There is an organization (www.honeybeeveterinaryconsortium.org) trying to determine which veterinarians will be willing to provide this service, but the only veterinarians close to headquarters of commercial operators are likely to be livestock veterinarians. Small animal veterinarians will more likely be working with small scale beekeepers. This should be interesting!

Queried about whether Apiary Inspectors of America had more information, President Mark Dykes adds:

"At this point most AIA members are working within their states to assist beekeepers and veterinarians with the changes in the law. Generally speaking it will be up to the beekeepers to form the relationship with their vets in order to get prescriptions for the required antibiotics. AIA will assist our members in providing veterinarians with the needed information for them to serve the apiary industry. If beekeepers or veterinarians have questions we recommend that they contact their state apiary inspection service or if the state does not have one then contact either the state department of agriculture or the state extension service. As more information and guidance becomes available AIA will update its members."





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WAS Meets in Hawaii 2016 - Conference Overview

by Dr. Malcolm Sanford, <http://beekeep.info>

The 2016 version of the Western Apicultural Society (WAS) met in Hawaii October 12 through 15 in the Ala Moana Hotel on Waikiki Beach, atop the extinct volcano now known as the island of Oahu. At least 2500 miles from any mainland, the location was as intriguing as was the event itself, a truly international gathering of scientists and beekeepers from around the Pacific rim. The theme, "new insights into old questions," provided a backdrop bringing speakers from across the globe to the Hawaiian archipelago, which stretches northwest across the Pacific all the way to Midway Atoll. A brand new island is ready to break surface to the southeast of the Big Island (Hawaii) becoming the latest addition to these fabled lands, somewhere into the next tens of thousands of years. It is possible, however, that Loihi will not break the surface as it traverses one of the world's best known "hot spots" and will remain a seamount for its entire existence. Time will tell.

It is difficult not to wax on about these islands, which collectively are the U.S.'s fiftieth state, the only one in Oceania, and steeped in aboriginal culture. The history of beekeeping in the State is just as fascinating in its details as provided by Scott Nikaio of the University of Hawaii at Manoa, reporting on information published by Kevin M. Roddy and Lorna Arita-Tsutsumi at the University of Hawai'i at Hilo:

"At the first meeting of the Royal Hawaiian Agricultural Society in August 1851 on the island of O'ahu, a committee was appointed to bring the first honey bees into Hawai'i. Henry A. Pierce, partner of Charles Brewer, shipped a 'fine hive' from Boston to Honolulu in 1852 on the good ship R. B. Forbes (Krauss 1978). Unfortunately, as the ship passed through the tropics on its way to Cape Horn, the increase in temperature melted the honeycomb and killed the honey bees. Another colony was ordered from New Zealand at about the same time, but was never shipped due to an apparent misunderstanding (McClellan 1940). A second attempt to ship bees from the U.S. Mainland was made in 1853, again from Boston. Two hives, one packed in ice, were shipped to O'ahu. The hives arrived in poor condition, and were later auctioned to C. R. Bishop, husband of Bernice Pauahi Bishop, for thirteen dollars (Krauss 1978). The bees survived for a short time, then died out. The society then made a public offer of ten dollars to "the person who shall introduce the first honey bee into the islands.

"On 21 October 1857, three hives of German dark bees (*Apis mellifera mellifera*) were shipped to Honolulu by William Buck of San Jose, California (Eckert 1951, Krauss 1978) on the American bark Fanny Major (Spoehr 1992). The trip took eighteen days and the colonies survived the journey in good condition. They were purchased by the Society for one hundred dollars each. The hives were placed under the care of Dr. William Hillebrand in Nu'uuanu Valley. There they thrived, and successfully established themselves such that by the following year, the three original hives had increased to nine colonies by swarming (Nieman 1942). Other species of honey bees were soon brought to the Islands. Italian bees

(*Apis mellifera ligustica*) were purchased in Los Angeles, shipped to San Francisco, and then brought to the Islands on the steamer Lehua in 1880 by Sam G. Wilder (Chamber of Commerce, 1941)."

Since introduction, honey bees, like many of the introduced species on the islands, led a carefree life, as did beekeepers. The industry grew rapidly, in the 1970s becoming a mecca for queen production. However, the risks of introduced organisms were always there, thus: "The Territory instituted a ban on the importing of packaged bees beginning on 17 September 1908. As of 1 December 1909, no serious bee diseases of any kind had been reported. The presence of bacillary diseases



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(*Bacillus larvae*) in California and elsewhere 'makes the quarantining of bees and honey entering the Islands a necessary measure for the protection of the industry' (Fullaway 1909). The ban remains in effect today."

Unfortunately, it couldn't last. Varroa was detected in 2008 and the small hive beetle (SHB) in 2009. As on the mainland, these organisms caused great problems with a 65 percent loss on Oahu and thousands of colonies lost on the Big Island, named Hawaii. Some four islands remain Varroa free, while SHB is found on all. The minutes of the Hawaii Beekeepers Association for February 25, 2008, 6:00 P.M. reveal the urgent issues of the time: "Items of interest for open discussion included: Varroa containment: area-wide campaign?; extermination of ALL bees on O'ahu: the SuperFerry's role in spreading Varroa; Varroa's impact on managed and feral colonies, diversified Ag, food security and self-sufficiency; The problem of "Rogue Beekeepers" and Varroa control; "death" of Apiary Act of 2008 (SB2586); Status of SB2586: COOL and definition of honey as a commodity under HRS Chapter 147; threats to valuable organic, pure honey's reputation; residues of Varroa miticides and seed corn pesticides in honey; Farmers Markets a continued success for the HBA and members with branded honey products."

So far, the 1908 law has not been repealed. The 2008 attempt to develop a new one (SB2586) looks dead. Several comments were published concerning this effort at the time, which appeared to concentrate on eradicating honey bees from the island of Oahu. The following comment about this legislation was published by Gus Rouse, then owner of Kona Queen, who has subsequently retired:

"As the largest beekeeper in the state of Hawaii I don't think SB2586 is what we need at this time. The beekeepers who do not want the DOA to know where their hives are located now are not going to register them if we have a law. The varroa mite will eventually kill most of these hives anyway.

"I strongly feel the state needs to put it's resources into moving forward with THE PLAN already in place. This is the Plan to attack the wild bee population and then follow up with exterminating the domestic hives in a coordinated effort. I already have the hives ready to replace the ones lost for those who need pollination.

"There remains a \$5-7 million dollar rural industry in Kona that leads the world in queen and organic honey production. Introduction of the varroa mite to this island would be devastating to both. This does not include the pollination benefits to coffee, mac nuts, and many other agricultural crops.

"The varroa mite has made it's way to nearly every corner of the globe. Hawaii has an opportunity to take action or ignore the issue. We hear Hawaii wants to support and protect agriculture and this would be a good time to demonstrate just that."

The Hawaii state beekeepers association published its last newsletter in 2005 and by some accounts is in disarray. The Big Island Association appears somewhat more up to date in its activities. In April 2011, participating in that year's WAS conference, Larry Connor of Wicwas Press wrote an article for American Bee Journal relating his visit to Big Island Queens, one of three major producers on Hawaii. There was no mention in his article concerning the legislation.

According to Mr. Nakaido, as of 2011 there has been a resurgence in interest in beekeeping via bee clubs and social media, but no registration regulations could mean lots of potential problems. There is no package queen industry in Hawaii; all islands have queen producers. At that time, however, a state apiary program was established.

The current beekeeping regulation situation was reported by Lauren Rusert, Hawaii Apiary Program Section Chief: "Our program was officially established in 2011. We are here to provide services to the bees and the beekeeping industries in Hawai'i. Honey bees are not native to Hawai'i, but they have been here for over 150 years, providing a variety of excellent honey and, most importantly, pollination for many plants. Local agriculture depends heavily on honey bee pollination. Beekeeping industries in Hawai'i include honey production and queen bee rearing for export." Thus, this program appears to be mostly a service organization to beekeepers, farmers and the general public, rather than a regulatory effort. Beekeeper registration in the State is voluntary only. All this could change in the future, however, as more and more attention is paid to the health of the honey bee and the state's beekeepers.

Ms. Rusert provided updated statistics on the beekeeping industry: The number of beekeepers by island is 130 (Hawaii), 37 (Kauai), 44 (Maui), 38 (Oahu), 7 (Molokai) and 4 (Lanai). Before mites, the average honey production was 93 pounds/hive and the State was 2nd in the nation in honey production with a value of \$3.5 million. Bee pollination was valued at \$212.8 million. Because the climate allows for year around bee production, there are three large and several smaller outfits producing 75 percent of Canadian queens and 25 percent of the U.S. mainland supply, valued at \$10 million, equal to papaya and banana production in the State.

Varroa control is a mix of the usual compounds including Apivar®, Mite Away Quick Strips MAQs®, Apistan®, Hop-guard®, formic and oxalic acids. Screened bottom boards, drone trapping are also on the menu. Unfortunately, the tropical weather conditions mean chemical materials are difficult to use and may quickly lose efficacy. Beetle control measures

include Brawny-Dine-A-Max® towels, diatomaceous earth and various mechanical traps. Mating nuclei are at high risk; full sun and strong colonies are considered the best prevention.

Ms. Rusert provided an interesting discussion on the American foulbrood epidemic on the Molokai Ranch in 1938. The disease wiped out 2400 colonies at the time. All but 246 were burned. The following is the conclusion of the Molokai incident from the history referenced above: "From 1938-1948, commercial honey production on Molokai virtually ceased. In 1948, the Ranch tried to revitalize the industry and hired apiarist Allen Luce. When Mr. Luce assumed control, only eighty-six colonies existed, of which thirteen were infected with Foulbrood (Eckert 1951). As of 1953, this disease was successfully eradicated, as no feral swarms were found to have it. Encouraged by their victory, University of California, Davis researchers continued to study the disease, and purposely infected several colonies at the Molokai Ranch with the disease to study resistance-building. As a result, bees demonstrated a greater resistance to foulbrood, which was due to several factors. Subsequently, steps were taken to reproduce these strains and cross breed in an attempt to increase overall resistance in all races (Eckert 1950, 1951)."

The genetics of Hawaiian bees include the usual suspects: German, Italian, Carniolan. Many hybrids are likely, but so far no Africanized honey bees have been found. Several mitochondrial DNA mitotypes have been found, including African and Ethiopian, some 5 lineages total.

Lessons learned concerning Varroa resistance on the mainland and elsewhere have resulted in Varroa Sensitive Hygiene (VSH), mentioned in Dr. Connor's article referenced above, being introduced since 2009. Several field trials are ongoing with about 228 colonies in a test yard. Mite samples are taken at six-week intervals and open mating is being employed. The VSH breeding is expected to continue with a single-drone insemination (SDI) component in the future. The team of researchers includes local producers, Arista Bee Foundation, ex-apiary inspector Danielle Downey (now employed by Project Apis m (PAm), Hawaii Department of Agriculture and the Baton Rouge bee laboratory.

Dr. Helen Spafford at the University of Hawaii is from Australia and well versed in biosecurity issues. She reported that the State may get 20 species of new insects each year due to human movement coupled with high amounts of environmental disturbance. Other possible introduced organisms include viruses, fungi, microbes and of course, plants. New in the environment are the coconut rhinoceros beetle and coffee berry borer. So-called "rapid ohia death" is also on the list. This is a "perfect storm" for the State that continues, Dr. Spafford concluded, mostly because biosecurity in general is low, especially when compared to places like Chile and the Galapagos Islands. One beekeeper characterized the beekeeping environment as the "wild west." Dr. Spafford says that biosecurity is simply not a priority for law makers and politicians at the moment, and there is limited federal assistance. Fortunately, there is more non-governmental recognition of the issue and so beekeepers, farmers and others may begin to see what can only be called a "sea change" in this area in the future.

The University of Hawaii is increasingly a player in honey bee research on the island through The Honeybee Project: "We are interested in developing practical treatment options for local beekeepers and establishing a sound research program that focuses on maintenance and improvement of the Hawaiian honeybees. Reducing the likelihood that the mite will invade other islands, and restricting the big island invasion is also a high priority, and we are investigating procedures for preventing feral bees from being inadvertently transported among islands on ship containers and other vessels. The goal of this website is to keep beekeepers and farmers informed of the bee-varroa issues in the islands and to facilitate the transfer of information from the University to the public."

Several folk associated with this project addressed the WAS conference. One emphasis was viruses. Both Dr. Stephen Martin and Ph.D. candidate Laura Brettell of the University of Salford in the United Kingdom provided their observations on the viral situation in the islands and elsewhere. Dr. Martin related an interesting history of the thinking about viruses. It could be that many of the issues affecting honey bees and reported on in the past, such as Isle of Wight and/or so-called disappearing disease might have been viral in nature, but these were not even in the discussion at that time. Viruses are also not mentioned as a major source in a more recent disease called Colony Collapse Disorder (CCD), but that is likely to change as this so-called "missing link" is slowly becoming more recognized. As late as 1996, according to Dr. Martin, only 18 viruses were known. There are many more with numerous variants, some benign. His initial predictions about viruses affecting honey bees were basically ignored by the scientific establishment for quite a period. However, observations that some honey bee populations with high Varroa counts did not necessarily collapse unless the viruses were present, and technology to identify these organisms, has finally given Dr. Martin's ideas some credence that they are indeed hugely important in honey bee health. He and Ms. Brettell continue to look at them via something called quantitative polymerase chain reaction (q-PCR) as noted in a summary of a recent paper:

"Martin et al. (p. 1304) exploited this unique situation to study the mechanisms behind the emergence. Honey bee populations have long been established on the isolated Hawaiian Islands but only recently have some islands become infested with the Varroa mite. This mite has selected for a single viral pathogen - deformed wing virus - among the honey bee

population, with the appearance of a single dominant virus strain, which has now spread worldwide. Thus, a normally benign viral pathogen has become one of the most widely distributed and contagious insect viruses on the planet."

The paper's abstract says: "Emerging diseases are among the greatest threats to honey bees. Unfortunately, where and when an emerging disease will appear are almost impossible to predict. The arrival of the parasitic Varroa mite into the Hawaiian honey bee population allowed us to investigate changes in the prevalence, load, and strain diversity of honey bee viruses. The mite increased the prevalence of a single viral species, deformed wing virus (DWV), from ~10 to 100% within honey bee populations, which was accompanied by a millionfold increase in viral titer and a massive reduction in DWV diversity, leading to the predominance of a single DWV strain. Therefore, the global spread of Varroa has selected DWV variants that have emerged to allow it to become one of the most widely distributed and contagious insect viruses on the planet."

Ms. Brettell discussed at some length her study of the honey bees of Fernando de Noronha island off the coast of Brazil. It has long been known that this population of European honey bees has tolerated Varroa mites without much damage. Her conclusion is that both low honey bee population and mite reproductive levels have yet to allow viruses to take hold. She called the situation on the island "a ticking time bomb." This is similar to present conditions on both Maui and Oahu. This information could turn traditional ideas about Varroa control on their head. Those looking at mite control might be able turn their attention to viral effects instead. If this is so, perhaps an inoculation, something akin to a flu shot in humans, might have a similar effect for honey bees. A question from Trevor Weatherhead of Australia concerning the mite haplotype on the island was not answered adequately. It is known that the first mites coming to South America were of the Japanese variation; the Korean haplotype is much more destructive and was introduced later. It is not clear whether a mite haplotype analysis was conducted by Ms. Brettell. So far there are 18 total, with the two above being most predominant in the five-species Varroa mite complex. She will be looking further into the situation.

Jessika Santamaria, University of Hawaii, Manoa is studying something called "viral spillover." Many of the variant viruses associated with spread of deformed wing virus (DWV) in honey bees have now been found in bumblebees. There is also evidence that these and perhaps other viruses could be spread via pollen to other insects in the islands and elsewhere. Investigations in this area continue.

Dr. E.M. Villalobos, currently in charge of both research and outreach efforts of the University of Hawaii Honeybee Project, is looking closely at wintering bees in Hawaii. This is complex issue, given the geography of the island, which has a variety of microclimates, mixed timing of both dry and wet seasons and basically no temperate winter. There simply are no patterns beekeepers can look at to guide them in making management decisions, making it difficult to develop any standardized apicultural calendar. It is more problematic given that honey and queen production can demand different conditions and situations. Dr. Villalobos soldiers on and has training in this given her experiences in Costa Rica. In addition, she is looking at honey bee diets on the archipelago.

Dr. James Wilkes of Appalachian State University discussed his ideas behind development of a computer application called Hive Tracks. Computer technology can assist beekeepers in making sense of the vast amount of potential information they get when visiting hives. It seeks to find a "big data" gap that exists and is based on something called an "Intelligent Management System." Hooking up a number of beekeepers is the best way to innovate collectively, concluded

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Dr. Wilkes, who is partnering with Project Apis m, the Bee Informed Partnership (BIP) and other organizations. Look for a commercial beekeeper edition of Hive Tracks to come out soon.

Dr. Patricia Couvillon, University of Hawaii, comparative psychologist and neurobiologist, gave a discussion of her findings using the honey bee. She concluded that "the honey bee is not a little robot." The insect has some cognitive abilities equivalent if not superior to the sea slug, octopus and several crustaceans. It is the best equipped invertebrate for brain study. Research in the proboscis extension reflex (PER) and studies by Von Frisch on dances show that these insects are similar to vertebrates, such as conditioned reflexes shown in Pavlov's dogs and other mammals. Pushing the envelope Dr. Couvillon claims that honey bees show abstract learning, something often confined only to humans. Several of her papers are found at Research Gate.

WAS 2016 featured a rather large contingent of Latin Americans. Professor Enrique Luciano Bedascarrasbure described a network designed to foster research, extension and innovation. He is a researcher at the National Institute of Technology in Argentina (INTA) and Apiculture Professor at the Universidad Nacional del Centro. The network called Redlac is a new platform aiming to foster apiculture as a development tool in Latin America and the Caribbean (FONTAGRO -IICA- BID) and the project FONTAGRO-AVINA which aims to foster development in the Gran Chaco region. The REDLAC effort had a stand in the exhibits area showing some of its attributes.

Dr. Natalia Bulacio Cagnolo, with degrees in biodiversity and biological sciences, is a researcher in the Argentine National Apicultural Program (ProApi) cooperating with several groups, including the National Bee Health Commission (CO-NASA), the European COLOSS initiative, and REDLAC. She administers the Argentine government's program regulating production and sale of Varroacides. Argentina is quite diverse in beekeeping efforts, having northern tropical and southern more temperate conditions. The former consists of small-scale rural beekeepers while the latter is much more industrialized. Like Hawaii, these differences call for beekeeper and regulatory flexibility.

Dr. Ana Cubero from Costa Rica is also affiliated with REDLAC. She is in charge of the national beekeeping program and professor at The Technical University of Costa Rica. Her discussion of chemical control methods for Varroa and conservation of the "organic" status of the nation's honey was well received.

Licenciado Marianyela Ramirez Montero, also of Costa Rica, looked at both formic acid and thymol Varroa treatments of Africanized honey bees in that country. Her conclusions were that thymol does not penetrate the brood cappings and formic acid does, making it a superior mite killer.

In Hawaii, formic acid appears to be used with considerable success among large-scale queen breeders, confirming this as the treatment of choice at the moment. It is not known, however, if resistance to this treatment will build up over time, but the chances seem much less than for other chemicals currently in use.

Another parallel with Latin America is Hawaii's growing awareness of the importance of native non-Apis bees. Among researchers in this arena are Dr. Jonathan Koch, looking at pollinators on the summit of the active volcano Mauna Loa (Hawaii); Dr. Karl Magnacca, Oahu Army Natural Resource Program, who has described 13 species of native bees; Dr. William Haines, Hawaii Department of Land and Natural Resources, developing rearing facilities for native insects; and Dr. Jason Graham, attempting to rear and release endangered, endemic yellow-faced bees, the first insects of this nature to make the federal endangered species list. Many of these efforts are confounded by pressure from other introduced insects, especially ants.

Dr. Ingrid Aguilar from CINAT, National University of Costa Rica described efforts to support meliponiculture in the country. She frequently travels, providing support to those interested in this activity.

Alejandro Reyes Gonzalez of the Autonomous University of Mexico is researching the rich fauna of family meliponidae in Northwest Mexico. He is both a beekeeper and a commercial pollinator of avocados. A big challenge in the culture of stingless bees is to ensure their survival as the major way they are cultivated is by collecting nests in the wild. Meliponiculture is not even on the radar for Hawaii presently. None of these insects have been found there.

The conference was topped off by presentations of Professor Emeritus Dr. Eric Mussen, University of California, Davis on pesticides and honey bees and an enthusiastic discussion by Beth Conrey, President of the Colorado Beekeepers Association, provided a remarkable discussion of her efforts to promote honey. Her title says it all: "There is Money in Honey."

Look for WAS to convene again next year in Davis, California.

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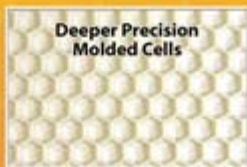
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CONFERENCE 2016

(Editor's note: Dr. Tolj and technician Sablic were at WAS 2016 in Hawaii with a poster presentation on this system. See next page discussion.)



Figure 1. Front view of the apparatus

Figure 2. FESB – University of Split



Figure 3. Mate Sablic and Dr. Ivan Tolj at work in the bee yard

CONFERENCE 2016

VarrTreat - Thermal Control of Varroa

Dr. Ivan Tolj, University of Split, Croatia

As you know, Varroa mite is a major international problem of beekeeping at this time. Since the 1980s, varroa rapidly spread around the globe and now infests more than 90% of hives. Estimated number of hives in the world today is around 80 million.

Most chemical products for fighting against varroa are at the same time toxic to mites and to bees, and can leave residues in the honey and in other bee products. The mites can also become resistant to the chemicals so more toxic chemicals may be applied from year to year. Some of the chemicals are even on the banned list in some of the countries. Chemical treatments are expensive and labor consuming.

The most alarming fact is that every year beekeepers are still losing 20 – 40 % of their colonies to varroa infestations.

Different methods for destroying varroa which are patented and available on the market either have a non-uniform temperature distribution, a high power consumption or are just too complex and expensive to build.

Our invention lies in a simple and low cost solution where a low power consuming heating device is integrated into the beehive outer cover. This allows quick and effective treatment without disturbing the colony as the apparatus emits little noise. Two fans disperse air uniformly inside the hive. (See Figure 1. opposite page.)

Some important comparative information:

- Mites are considerably more temperature-sensitive than bees.
- Normal hive temperature is around 35 degrees C/98.6F.
- 43°C/109.4°F is enough to knock mites down but not harm bees.
- Bees can readily tolerate 42°C/107.6°F; higher temperatures result in fanning and water evaporation (in fact, helping to uniformly disperse our heating throughout the hive).
- Bee brood can tolerate up to 44°C/111.2°F for the time period necessary with this system.
- Worker bees can tolerate up to 49°C/120.2°F.
- When bees form a "bee ball" around a wasp, they increase the temperature to 47°C/116.6°F to kill it.

The system works in the following way: before treatment the original outer cover is replaced with the apparatus/beehive outer cover temperature conditioner. Treatment temperature is set via the controller display unit. Air inside hive is heated and uniformly distributed without strong air flows. Power for the heating element, air fans, temperature controller, display and supporting circuitry is provided by a durable 12V PbA battery pack, which makes it easily portable from hive to hive. Upon completion of treatment, apparatus is removed and the original outer cover placed back. The entire treatment is quick, economically viable, compact and robust enough for outdoor use. An integrated handle allows easy manipulation/transportation of apparatus.

Results of testing proved the invention is between 80 to 95% effective in destroying/controlling varroa mites. Ambient outdoor temperature during tests was 21.0°C/69.8°F and with a fully charged 12V PbA battery pack, air inside hive (measured between frames in the middle of the hive) was heated to 43.0°C/109.4°F within 18 minutes. The temperature probe attached to the brood chamber measured as high as 41.0°C/105.8°F. Exposed time was 15 minutes. The wax inside the hive did not melt. During the tests, thermal camera images confirmed that uniform temperature distribution within the hive was achieved.

This system does not kill mites via the temperature control. After the treatment, it is necessary to clean the hive floor tray in order to remove knocked down mites. There will always be some mites that escape and get back onto the bees. You never can get rid of 100% of mites in the hive. Rather, you keep mite levels below levels that compromise the bees. Sticky boards or cooking oil in the bottom tray will maximize the mite catch.

The apparatus was invented by Mate Sablic, a lab technician, and Ivan Tolj, a senior teaching assistant, at the Department of Mechanical Engineering and Naval Architecture at the University of Split, Croatia (Figure 2. opposite page). The apparatus has a pending patent and numerous field studies have been conducted, sponsored by the World Bank. Currently the inventors are searching for other testing partners in order to finalize their research. After this is done the final product should be on the market this year.

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The Care and Feeding of Vendors - Part 2

This article, by Ann W. Harman, appeared in Bee Culture magazine in June 2012. Part 1 was reprinted in the November 2016 edition of the WAS Journal. Here is Part 2, again with the author's permission.

If you recall in Part 1 of the saga of vendors at beekeeping meetings I mentioned some other needs common to the two groups and also needs special to each group. I defined the two groups as the Big Guys—ones like Dadant and Mann Lake, and the Small Ones, who are usually local to the meeting—ones like the soap makers and T-shirt sellers.

Do you remember the Vendor Coordinator (VC) so essential to the smooth functioning of the meeting and especially the vendors? Although the tasks performed by the VC before, during and after the meeting seem enormous they are not.

Let's look at a few other things the VC can do for both groups of vendors. The VC needs to provide each vendor, large or small, with the program of the meeting as soon as the club has made it available. Even a tentative program is useful if the Program Committee is slow in composing it. Let's see why advance notice of the program topics is so important.

Suppose the program contains a presentation and/or workshop on raising queens. Equipment suppliers know that all kinds of queen-raising items will be in demand. Advance notice means that the equipment vendor now knows to bring a large supply of the numerous items that pertain to queens. An increased number of books on raising queens will be needed. Presentation and workshop on mead? Bring more mead-making supplies. Mead books will fly off the table. Have plenty of mead books for sale.

Although the program for a meeting may be posted on a website (not all are user-friendly) vendors are busy with their everyday businesses and tasks. Once vendors realize that there is a VC looking after their needs they can then continue planning their wares for the meeting.

Giving the vendors the program in advance means more happy customers and thus more happy vendors. Since vendors are busy packing their wares to come to the meeting they may neglect to bring the program with them. If the VC can provide vendors with a program on the day(s) of the meeting then the vendors know what time the breaks and meal times are and can be prepared for the crush of customers. The VC could put a program along with the identifying label on each vendor table.

Some meetings, especially the larger ones will have "pipe and drape" in the vendor area and table covers. All vendors, large or small, need to know if these will be used. Banners and signs can be hung from the pipes at the back of the space. Small vendors, who may never have had a banner, may wish to have one made.

At some venues, usually for smaller associations, vendors may be placed in the same room as the audience. The VC should work with the meeting planners during site selection to try to avoid such a situation. Neither vendors nor speakers want to compete for the attention of the attendees. However, if the situation is unavoidable it would be nice if the vendors would refrain from doing business while the speakers are giving their presentations. It is always helpful if the Vendor Coordinator could make several announcements during the program that vendors will be open for business during breaks and lunch but not during the presentations. It is just not polite to have background conversation while a speaker is talking.

Occasionally non-beekeepers may come through the vendor area. On rare occasions the meeting has been advertised to the local community. Other times, more common, a meeting held at a college brings faculty and administrative staff to the meeting. All these people are quite curious about bees and honey bee problems. Having the non-beekeeping public is great publicity for honey bees.

The Big Guys have special needs. The Big Guys are the national and regional equipment manufacturers and suppliers. They have trucks with trailers filled with big boxes and shelf units on wheels. They bring bulky extractors, boxes of all kinds of foundation, woodenware (tops, bottoms and hive bodies), big boxes filled with helmets and veils, plus all the small items beekeepers need.

If the distance from supplier to venue is a long one, it is more practical to ship boxes rather than drive. The VC now needs to find where these shipments can be received and how to get them to the venue. Sometimes the venue can receive them; other times absolutely not. A club should be able to find a member to volunteer space for shipments and a way to transport them to the venue. Do not expect the VC to volunteer—the VC has quite enough responsibilities.

When the venue is within driving distance the suppliers will come with truck and trailer. Here is where access and parking are very important. Is there a loading dock or a ramp? How much room is there at the dock? Perhaps two or three suppliers arrive at the same time. The VC needs to think about both the initial unloading of the trailers and the loading up at the end of the meeting. For everything to go smoothly and have happy vendors it is necessary for the VC to know the situation and inform the vendors ahead of time.

Now that the trailers are unloaded, it's time to park them. They take up two spaces. Furthermore the beekeepers have ordered supplies and plan to pick them up at the meeting. One vendor said fully one-third of his trailer was full of boxes to be picked up at the meeting. So the customers need access to the trailers. Can the venue parking lot satisfy both the vendor and the customers? Here again the VC needs to see the situation ahead of time so that the vendors can be guided on the meeting day.

Now that the Big Guys have unpacked their bulky wares, what can be done with the collection of very large boxes? Will these boxes have to be stored in the trailers or trucks? In there the boxes will be in the way of customers coming to pick up equipment they ordered. Perhaps the VC can find storage space at the venue that would be convenient. The VC will need to discuss storage with the venue management and then inform the vendor.

The Small Ones are perhaps the simplest vendors in terms of needs. However some are very used to being a vendor while others may have attended only a few meetings. Some may be attending their first meeting as a vendor. A bit of special attention given to the first-time vendor may encourage them to return to future meetings, even if a distance away.

Frequently a Small One will be a single person. Sometimes a Small One may not actually be a beekeeper. Having a program at the meeting is really important. The vendor can then know when few or no customers will come (a rest room break for the vendor) and when to be ready for the breaks and lunch.

As the meeting is approaching the end, the VC could pay a short visit to each vendor. First, each vendor must be thanked for participation in the meeting. In addition the VC is looking for problems that may arise again in the future. Suggestions of any kind should be accepted even if impractical. However, vendors must recognize that not every venue is going to be perfect.

Sometimes a local association has a local vendor. The VC could certainly contact this local vendor for information on the venue or other aspects of the club's meetings. The VC would then be in a better position to give information to prospective vendors.

What if it is pouring rain at set-up or take-down time? Well, that can be blamed on Mother Nature, not on the Vendor Coordinator or the vendors. However, it really is up to the vendors to supply their own tarps, protective plastic sheets and

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umbrellas. Perhaps a few extra volunteers could speed up the work.

Remember, the more advance information any vendor, large or small, has, the happier the vendor will be. Oh yes, vendors! Be sure to thank the VC for all the work before, during and after the meeting.

What? Your association does not have a Vendor Coordinator? And yet vendors do come to meetings. It's now time to find a VC in your membership. You will soon find your meetings become vendor-friendly. You may attract both more Big Guys and Small Ones that will lend variety to the wares your membership wants.

Vendors really do help attract beekeepers to a meeting. Remember, beekeepers - whether newbies or experienced - want to see equipment of all kinds and ask questions about the new items in catalogs. When more vendors come to a meeting, more beekeepers will come, increasing the revenue for the association and the vendors, so vendors will be happy to return.

The more beekeepers attending the meeting the better informed these beekeepers are to make their craft more enjoyable for themselves and their bees. Isn't that education the main purpose for holding meetings?

Bayer North American Bee Care Program Winners 2016

December 13, 2016, recipients of the fourth annual Bayer Bee Care Community Leadership Award were announced. They are Scott Witte, director of agronomy at Cantigny Golf in Wheaton, Illinois, and Luke Cella, executive director of the Midwest Association of Golf Course Superintendents (MAGCS). The pair is recognized for their efforts to promote healthy ecosystems for honey bees and other pollinators through the Bee Barometer Project. The award, sponsored by the Bayer North American Bee Care Program, was created to distinguish individuals who use their interest in honey bees to benefit a community, and has now evolved to recognize the important partnership between beekeepers and other environmental stakeholders in their local community. As the 2016 winners, Witte and Cella will receive a \$6,000 grant to bring their program to other golf courses in the area. Additionally, the Robert R. McCormick Foundation, of which Cantigny Golf is a part, will match the grant two-to-one to set up a Pollinator Fund of \$18,000 that will be utilized to help promote diverse ecosystems on golf courses throughout Chicago.

The Bee Barometer Project, founded by Witte in 2010, is dedicated to changing public perception about golf courses' roles in conservation and land management. Golf courses offer large areas of valuable greenspace across the Midwest, which are ideal for supporting diverse ecosystems with various types of flora and fauna, not just for sport.

"I'm very honored and humbled to have won the Bayer Community Leadership Award," said Witte. "With these funds, we can perpetuate the message that golf courses are very healthy ecosystems when managed properly and proactively, and honey bees and pollinators can coexist side by side with world class golf conditions all across the U.S."

Cantigny Golf is home to six managed hives and two wild hives, all of which thrive on native wildflower patches found throughout the grounds. However, these bees support more than just the pretty flowers that line the fairway. They offer a great learning opportunity for golfing patrons about the important role pollinators play in the outdoor landscapes we enjoy. Additionally, honey provided by the managed hives is incorporated into meals prepared by the course chef, as well as sold in the pro shop to help generate funds for Witte's environmental projects.

Through his role with the MAGCS, Cella has worked with Witte to implement and promote environmental initiatives modelling the Bee Barometer Project on other Chicagoland area golf courses. Part of the Community Leadership Award grant will be put toward a scholarship fund to enable more superintendents to begin their own beekeeping and pollinator programs.

You can also follow and share with us on Twitter @BayerBeeCare, on Facebook at Facebook.com/BayerBeeCareCenter and view photos on Flickr. This article plus video on cooperative beekeeper-golf courses efforts at pollinator protection are at <https://www.crops.bayer.us/news/press-releases/2016/12132016-illinois-golf-course-beekeeper-and-allied-association-pair-wins-2016-leadership-award>.

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REGIONAL NEWS

ALBERTA

Bob Keenan

Beekeeping in Alberta is a large commercial enterprise centered in the Peace River area in the North and with a growing number of colonies in Southern Alberta for pollination of pedigreed hybrid canola seed production. Reportedly Alberta Beekeepers supplied 75,000 colonies for this seed production. The area also grows a large acreage of alfalfa.

The Alberta Provincial Apiculturist, Dr. Medhat Nasr, in his report lists 1400 beekeepers with 316,000 colonies and an average yield/colony of 125 pounds or 55.5Kgs for 2016.

Last winter in Alberta was mild and losses were in the range of 15%.

For the hobbyists, which probably totals less than 1000 and who have 1 – 100 hives, their numbers continued to grow around the three largest cities. The mild winter yielded strong colonies in spring. Most people treat with 2 Apivar strips/deep in spring and fall.

In the Calgary & District Beekeepers Association, the membership grew in 2016 with the addition of 112 to bring the paid membership to 297 people. A big draw for new members has been the 2-day weekend beginner courses put on twice a year. Also, the club secured a firm to provide liability insurance which was of special concern to members keeping bees in the city.

A successful first-time entry by the club to the Calgary Stampede was received well and plans are to participate in 2017 as well as demonstrations and honey competitions at local fairs.

The club continues to have a group bee package program and a Swarm Recovery Team.

Meetings are well attended with 80+ members/meeting. As often as we can we have outside presenters. Equipment purchases have been made easier by two new suppliers in our club.

BRITISH COLUMBIA

Ian Farber

The end of year 2016 brought many beekeepers a mixture of surprises; some were happy, others disappointed, and a few were bewildered.

Overall, the province of B.C. has close to 40,000 colonies. One surprise and disappointment is that the 2016 provincial average honey yield for these colonies was 48 lbs. per hive, down from the long-term average of about 75 lbs. per hive.

Weather and location played a key role in explaining the honey yield of 2016. The Northwest area of B.C. weighed out at 111 lbs. per hive on average. All other areas produced far less. Another surprise is that despite the low yield, wholesale prices are down from last year, but retail and farm gate prices for beekeepers' sales are up.

British Columbia's queen breeding industry raised almost 25,000 queens. These were mostly used by the beekeeper but nearly 5000 were sold outright. Pollination fees averaged \$ 93.00 per colony for the approximately 27,000 pollination units rented out.

An overall mild winter followed by early warm spring temperatures allowed for good winter survival and rapid colony buildup. Then the rains came. Some areas definitely benefited from the June and July rains as forage crops flourished, keeping blooms viable longer. Sometimes, alfalfa cutting was delayed so blossoms were available to the bees for a longer than normal period of time. In other areas, this rain has been described as cold and dismal and detrimental to flowering crops. Sun worshipers were heard to remark that this was "the summer we never had." Another result of the weather was a high number of swarms being reported in many areas, which bewildered many new beekeepers.

Some very positive observations involve the vast increase in beekeeping courses and therefore, more new beekeepers. Clubs are reporting increases in members. Events such as the Day of the Honeybee continue to be well attended at venues around the province. Some clubs are offering formal mentoring programs for interested and committed new beekeepers. More beekeepers are carrying their honey to farmers' markets. These beekeepers set a premium price for their premium honey and often the honey is sold out by market's end.

Another final surprise is the cold winter temperatures throughout the province this December and January. This is not an "El Nino" year and snowfall levels have increased, temperatures are colder and there have been fewer times the bees have been able to take cleansing flights in many areas. Let's hope that our spring surprise is the bees' natural instincts and genetics brings them through the winter and they emerge healthy and strong.



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SASKATCHEWAN

Doreen Bradshaw

2016 was off to a great start with a very mild winter and early 2016 spring. The bees came through the winter in great shape, warm weather, all is well. Then the late summer rains came and would not stop until November!! This had an impact on honey production in late summer; however, production in the province was slightly above average at 204 pounds per hive. November was warm and honeybees were collecting pollen right to the end of the month.

Beekeepers in Saskatchewan are pleased that we now have an Apiary Intern, Graham Parsons to assist our Provincial Specialist in Apiculture in providing leadership to beekeepers. This was a much-needed position.

Regina and District Bee Club entered its two booths in Canadian Western Agribition to sell honey products and to teach the more than 9,000 students attending the one-week event about bees and beekeeping. 2016 was the highest number of students ever, in the more than 30 years of participation.

A major issue starting this year is rules with antibiotics. Beekeepers will now need a prescription from a veterinarian and will purchase any medication from a vet. It appears Saskatchewan has AFB under control, however, the case is being followed closely.

It is expected that there will be high mite levels in the spring that may cause high winter loss.

MONTANA

Jerry Bromenshenk

It was below zero at nights for the past week, with deep snow drifts. Now it's all melting! Most of our commercial bees are in California, staged for almond pollination.

Camillius Lay, the Montana State Entomologist, (agr.mt.gov/Bees) provided me an update for 2016. According to Cam, as of mid January, Montana had 198 registered beekeepers, about 35 of whom are voluntarily registered hobbyists. The rest are mostly commercial beekeepers, about 110-115 beekeepers, who are required to register each of their apiary locations. Montana has more than 5600 registered bee locations, a slight increase from last year. Montana is the fourth largest state in the union, but as many bumper stickers say – Montana is Full! Although stickers usually refer to people, 5600+ registered apiary locations more or less covers all suitable honey bee sites, resulting in more attempts to circumvent location registrations.

Our state legislature is currently in session, hopefully with nothing more than a little clean-up of some language planned for the Bee Act. Rumor has it that some leaf cutter bee producers are trying to get per-capita taxes from the Department of Livestock sent over to the alfalfa leaf cutter bee (ALCB) program.

The new VFD requirements for use of antibiotics in beehives is causing some stir amongst the hobbyists.

State bee inspections found some AFB and EFB, and lots of collapses due to mites. Colony collapses were most prevalent in the natural or treatment free colonies. This is consistent with data collected by a group of Master Beekeepers from our beekeeping course. This group surveyed 1300 beekeepers! They found a disproportionately high level of colony loss amongst respondents who were classified by the survey as bee-havers' compared to those beekeepers who closely managed and treated bee colonies.

The University of Montana (UM) School of Extended and Lifelong Learning's Online Beekeeping Program (umt.edu/bee) graduated the first two Master level classes in 2016. Together, these two classes generated over 60 research project reports. Seven class sections from Apprentice through Journeyman to Master are scheduled for 2017.

The results from our classes indicate that multiple sources of mite infestations are becoming increasingly common in the USA. It used to be the occasional neighbor, now some areas have dozens of untreated bee operations, making it almost impossible for owners of carefully managed bees to keep their varroa mite levels under control.

Finally, Dave Wick of BVS, Inc. in Florence, Montana, is offering free virus detection using the IVDS technology developed by the US Army. His offer applies to students in the UM Online Beekeeping Program, as well as to local bee organizations. Participating beekeepers have to collect the bee samples, pay for shipping to Dave, and have some kind of plan for what they intend to do with the results. Limits are 20 bee samples per bee club, not to exceed four times a year.

Sarah Red-Laird, Bee Girl, is helping coordinate the club project. The objective is to tie in to Dave's national honey bee virus mapping project.

You can reach Dave at mrwick@montana.com, 406-369-4214.

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IDAHO

Steve Sweet

Idaho's sideliners and hobbyist beekeeper organizations continue to grow, as the state is now represented by seven active beekeeping organizations – up from four clubs in 2015.

1. Last year, the students at Boise State University made huge strides in organizing their "Boise State Bee-Team," with 15 members meeting twice per month. The students are managing four booming hives on their "Rooftop Bee Farm" high atop the Student Union Building smack dab in the middle of the campus. The students have an active social media presence and continue to dominate local honey sales in the campus bookstore. The highlight of their year was the opportunity to host Jennifer Berry for a community education session in conjunction with National Honey Bee Day in August.

2. In 2016, nearly 40 beekeepers of Southeast Idaho/Upper Snake River Beekeepers (Idaho Falls) have been meeting on a regular basis.

3. Pocatello continues to host a consistent group of approximately 20 individuals and meets two times per year. The group participates in a spring-time nuc-making workshop with 75-100 participants at 2J Honey Farms in Blackfoot.

4. Nearly 30 Magic Valley Beekeepers meet every other month in the Twin Falls area, focusing on beekeeper education and community outreach through local fairs and events.

5. In Northern Idaho, the Palouse Beekeepers meet on a monthly basis.

6. Idaho sported a new club in 2016, when the Southwest Idaho Natural Beekeepers Club formed. A group of 25 active members meets once a month where they "explore organic and natural methods of beekeeping without being pressured to use pesticides and other chemicals that (they) have all been told must be used." In addition to monthly meetings, the group has an interest in potlucks and picnics.

7. The Treasure Valley Beekeepers Club counts over 250 dues-paying members across Southwest Idaho and Eastern Oregon. The TVBC continues to support an active web presence with 1) a site at www.idabee.org, offering local monthly recommendations on best management practices, and 2) regular contributions to a Club FaceBook page.

Regular monthly meetings and a commitment to beekeeping education continue as the TVBC's hallmarks. To date 62 members of the TVBC have actively participated in the Oregon State University Master Beekeepers Program at the Apprentice, Journey and Master levels. Throughout the year, Club members also maintained six beehives at Boise City's

Foothills Learning Center, staffed a very active booth at the Western Idaho State Fair, and participated in the Idaho Botanical Garden's annual "Bug Day," where the emphasis is on introducing local kids to the magic of entomology.

In the Spring, working in cooperation with Honeygold Corp. and Noyes Apiaries, two prominent Treasure Valley queen production operations, the TVBC again distributed hundreds of Washington State University Program queen cells to Club members. The TVBC is especially grateful for the continued WSU Program queen support received through Dr. Steve Sheppard and Dr. Brandon Hopkins.

The summer's highlight arrived once again with Governor Butch Otter proclaiming Idaho Honey Bee Awareness Day, reported on in depth in the November WAS Journal.

Closing out 2016, the TVBC was fortunate to host Ellen Topitzhofer, Oregon State University Crop Protection Agent. A full house of 80 hobbyist beekeepers listened with rapt attention as Ellen provided current information emphasizing the necessity of good bee management practices, along with tips and techniques for raising healthy bees that she's acquired working alongside successful beekeepers across the Pacific Northwest. This was an excellent session, chock full of information needed for healthy successful beehives.

The TVBC closed out 2016 as another banner year, successfully emphasizing education and community involvement. Building on the success of prior years, the Club is pulling out all the stops for National Honey Bee Day, 2017. In honor of Dr. Dennis vanEngelsdorp's scheduled appearance for the Club's 2017 festivities, the TVBC ringleaders are making arrangements with some influential Idahoans to arrange for a Total Solar Eclipse to grace the latter part of August while Dennis is out in the Gem State. We'll just see.



Students with the Boise State University Bee-Team enjoyed the opportunity of learning beekeeping basics and tending bees at the Rooftop Bee Farm on top of harvesting their first honey crop early in the summer of 2016.

ARIZONA

Zack Funke

Not much to report from Arizona. My honey sales have diminished at farmers' markets since the summer. Many markets I have participated in have closed over the last year (3 to be exact). This may indicate a saturation of vendors or supply.

I recently relocated a hive from a fallen tree into a Langstroth hive next to the log. This whole event was photo-documented and will be in the January 2017 Elevate AZ online publication. The hive in the box has new comb being drawn out but I couldn't find the queen. I used a beevac and did comb cutouts. The bees seemed to immediately migrate back to the original log site after the beevac relocation but they gradually migrated to the comb over the course of 4-7 days. A part of the hive may have absconded because there seem to be fewer bees.

Propolis tincture has been stimulating interest at markets. Save your propolis!

I have drawn comb stored in my garage for the upcoming honey season. I froze each frame to preserve it.

This past year I have been refining my approach to beeswax rendering. I have developed an efficient strategy for the small time beekeeper that wants to maximize their wax production by simply using a hand press and two crockpots. It is a messy business though. With the wax I made candles and lip balm that I am selling online and at farmers markets.

HAWAII

Peggy Beckett

For seven years, Big Island Beekeepers Association has had a volunteer coordinated Hawaiian Natural Honey Challenge for the beekeepers of the state of Hawai'i. The Challenge is for any state beekeeper who tends and harvests their own raw, unfiltered, unheated natural honey. A two part process, the formal judging looks at flavor, texture, aroma and appearance. It is followed by a People's Choice tasting and voting for favorites.

This year the People's Choice was presented at the 2016 WAS conference on Oahu. We were excited to share our tropical honey varieties and tastes with WAS conference participants from around the world, hear their responses and send some home with them.

This years People's Choice winners are:

Best of Show - Kelly & Michael McCoy (Maui)

Liquid: 1st - Kelly & Michael McCoy (Maui)

2nd - Autumn Gormick, Hawai'i Bee Company (Hawai'i)

3rd - Tie: Georgia Putnam, Polestar Gardens (Hawai'i)

Kawika Seabag, Moon Wai Mele (Hawai'i)

Solid: 1st - John Pascual, Guerilla Apiaries, (Hawai'i)

2nd - Erik Belcher, Alina Meli (Hawai'i)

3rd - Jim & Linda Wakefield, Puna Bear Honey (Hawai'i)

Comb: 1st - Autumn Gormick, Hawai'i Bee Company (Hawai'i)

2nd - Joyce Takahashi, Mikimacs (Kauai)

3rd - Autumn Gormick, Hawai'i Bee Company (Hawai'i)



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COLORADO

Miles McGaughey

Greetings from beautiful Colorado. At the time of this writing, the Mountain State is buried under snow so deep that they actually closed the ski areas due to safety concerns! As beekeepers look at it though, every drop of honey starts with a snowflake around here. The long, extended fall allowed ample time for mite treatment and feeding this year, so colonies went into winter in great shape. That being said, Colorado is still suffering 50% - 55% annual losses. Ever optimistic, beekeepers are going to meetings, preparing equipment, and gearing up for spring!!!

We look forward to seeing you at the 40th gathering of W.A.S. in sunny California, seeing old friends, learning all the newest science on beekeeping, and getting a feel for the larger beekeeping world! Take care.

WASHINGTON

Jim & Cyndi Smith

Hello from Washington State. In my opinion, the biggest news from our state is the involvement of the state officials in keeping our bees alive and healthy. Through tireless education on the part of the state beekeepers' association, our state has responded to the needs of bees/pollinators, stepping up to work with beekeepers to save and enhance the forage needed to keep them healthy. The cosmetic roadside mowing has stopped to encourage the growth of natural wildflowers and bee feeding plants and the governor, along with his wife, have had hives placed on the governor's mansion grounds. There is a lot of activity behind the scenes and several state agencies have been working to improve the forage for the honey bee, encouraging native plants to be placed along freeways and passing out seed packets. A four year pilot program was started to determine what mixture of native and non-invasive plants are the best option for replacing noxious weeds with forage that has similar levels of nectar and pollen needed for healthy bees. They are also helping landowners replace their weeds with bee friendly plants, attacking this issue on two levels, working in union for the betterment of the bees and bee health.

The capitol campus is also being used for research, testing landscapes made of slow-growing, drought-resistant grasses and meadow-like plants as these kinds of landscapes are better for the environment and for pollinators. They are also adding mason bees in eight different spots for diversification of natural pollinators.

Beekeeping across the state is very active with workshops, events and education. The Parkland Prairie Restoration project is moving forward with a work plan in place, a timeline and volunteers to make it all come together.

Here is to 2017 continuing forward on every level possible to enhance, promote and educate for bee health and prosperity. See you at UC Davis!

CALIFORNIA

Archie Mitchell

In California, the year 2017 should be a good one for many small-scale and commercial beekeepers for the following reasons: rain, rain and more rain in the forecast, breaking our almost 10-year drought. In Northern California, this winter 2016-2017, has been one of the wettest on record. Michael Anderson, the state climatologist, recently told the Los Angeles Times that "for most of California the end of the drought is in the realm of possibility."

He based his forecast on the charts indicating jumps in snowpack and precipitation amounts. As of January 10th, the U.S. Drought Monitor (www.droughtmonitor.unl.edu) reported that 41.78 per cent of California is out of the official drought category. However, the parts of the state still under drought conditions are almost entirely in the Southern half of California with the most intensely dry areas centering around Ventura County.

In Santa Barbara County where I live, North of Ventura County, our main water source, Lake Cachuma is at 7 per cent capacity and recent rains have not had a significant impact on raising the water level. It should be noted that the city of Santa Barbara depends on Lake Cachuma water and because of the potential water crisis the city will be activating a desalination plant to convert saltwater from the Pacific Ocean into drinking water.

Other cities in San Barbara County including Solvang and Buellton, are exploring various options for water, considering the on-going drought conditions. Rainwater is critical to producing adequate forage resources and moisture for our bees' survival and productivity. The best news from California, especially for commercial beekeepers, is that the 2017 projected almond pollination fee per colony is \$193.77, according to the California State Beekeepers Association Pollination Survey. This is a nice increase from the 2016 projected fee of \$179.64; and last year, the actual fee was \$188.52.

Another newsworthy item is the Master Beekeeping Program now offered through U.C. Davis. Visit this link, <http://elninobeela.ucdavis.edu/courses.html>, for a full description of the program. Those interested must complete an application,

due on June 1; notification of acceptance will be made by June 15. There is a \$200 program fee for enrollment.

The Los Angeles County Beekeepers Association (LACBA) will be offering free Beekeeping 101 classes for members from February through October in 2017. The first class is set for the second Saturday in February and continuing on the third Saturday of each month, in March, starting at 0900 and ending at noon. Membership is \$10 per household. New members are welcome to join at the classes. There will be no class in September. The classes are held at 12640 Little Tujunga Road in Sylmar, California. Contact (818) 312-1691 (Bill Williams) for more details. Here is his website: www.billsbees.com

Last year was my first opportunity to attend the Olivarez Annual Hobby Day event sponsored by Ray Olivarez and it was worth the very long drive from Lompoc to Orland. Ray provided a venue that included outstanding speakers, quality packages and queen bees, and free food for everyone. The turnout was very large with beekeepers from all over the state. The 9th Annual OHB Day is set for April 8 and more details can be found at Ray's website: www.ohbees.com

The California State Beekeepers Association invites everyone to their Annual Convention set for November 14-16 at Harrah's Lake Tahoe. For more details, visit their link: www.californiastatebeekeepers.com

Finally, this year, I am looking forward to our 40th Annual WAS Conference which is scheduled to start the day after Labor Day, Tuesday, September 5 and continue through Friday, September 8, at UC Davis. More details will be posted on our WAS website and in the WAS Journal. We look forward to seeing you all there!

You may like us at www.facebook.com/WesternApiculturalSociety and the other option for more information is <http://westernapiculturalsociety.org>

ALASKA

Joe Carson

Hello from Alaska.

I just got off my dog sled team after running tons of miles throughout the back country of Alaska at about -10°F. The dogs do great especially with our Pet Treat containing bee pollen, bee propolis, royal jelly and honey. We add some other natural ingredients and it is only air dried and not bled to damage the goodness of the bee ingredients.

Alaska has had little snow this season. This will not bode well for the bees wintering out of doors. Snow is the best insulator for our hives up here in the North Country. There are those that put their hives in a communal Conex container which is supposed to be temperature controlled but the last few years has shown less than 40% survival rate in the spring. Diseases are spread and other issues abound. We see less than 10% winter loss for those hives that are wrapped, candy boards installed and 60 pounds of stores left on the hive. The better the snow load the better our winter survival is.

A record number of packages was shipped to the "Last Frontier" this past April. My unofficial count indicates about a 25% increase in packages. My best guess for package sales this coming April will be up another 10% - 15% over 2016.

Nucs are not shipped to Alaska. It is getting harder to ship packages to Alaska because Alaska Airlines is the only major airline transporting bees up here. If there are any pets on board the plane the bees cannot be shipped. A couple of package suppliers are using an Asia Air Freight Company which can take 3-5 days transit time to Anchorage. Alaska Airlines allows for bees to be packaged during the day in Oregon, driven to Portland airport and on the night flight, where they arrive prior to 2 am. That same morning they are distributed to beekeepers much fresher and ready to be hived. A 4 lb. package of bees goes for about \$130.00 ea. or more. In Fairbanks, I hear there is a dealer charging upwards of \$165.00 a package.

We would certainly like more snow and it will most likely come in February or March. March is typically the highest snow month for South Central Alaska. On the bright side, less snow means those pesky mosquitos (Alaska State Bird) do not have adequate insulation for wintering so we can hope for fewer mosquitos this summer.

Queen quality is always an issue, especially with the long transit times for some - overheating on the tarmac, too cold in the cargo hold, etc. All contribute to poor quality of packages which breeds discontent with the fledgling beekeepers and can contribute to the extremely high turnover of beekeepers. I see the average Alaska hobbyist staying in bees for about 3 years before quitting. High cost, low success rate for the first couple of years as they learn and then poor quality of stock are all factors and something that the package dealers need to address if they are going to sustain the number of beekeepers in our state, producing high quality chemical and pollution-free honey.

Mush On!

New Mexico

Jessie Browne

This has been a fantastic year for beekeeping advocates in New Mexico.

In 2016, Albuquerque City Council adopted a Bee City USA Resolution, pushed forward by the NM Beekeepers Association and Think Like a Bee. Residents of this city can look forward to city wide celebrations in the summer of 2017, as well as an open dialogue with the city regarding bee friendly practices. Want to learn more about Bee City USA and how you can make it happen in your own town? Learn more here: <http://www.beecityusa.org>.

Congratulations to the new group of students who graduated from the NMBKA Certified Beekeepers Program. With an average of 24 students entering the program, from all over New Mexico and their 40 hours of volunteers work, our state sees about 960 hours of bee education and advocacy each year. These students volunteered to speak about their love of bees at events like the NM State Fair, Santa Ana Environmental Fair, Valle De Oro National Wildlife Refuge Birthday Celebration and many, many more.

The New Mexico Beekeepers Association supported legislation crafted by Wildfriends NM for Senate Memorial 103 urging State Agencies to protect declining bee populations and requesting the Governor to declare "Bee Aware Day." This Memorial was passed and local beekeepers traveled to classes all over NM, from Silver City to Rio Rancho, to thank the students and give a talk about honeybees.

Our Association also worked with the USDA and NMDA to oversee the completion of the USDA Honeybee APHIS Honey Bee Pests and Disease Survey with an added Pesticide portion for NM, where 24 bee yards with 8 or more Langstroth hives were tested in different regions around the state. We look forward to hearing the results of the health of our hives, after the test samples have been analyzed.

Happy beekeeping from the Land of Enchantment!

UTAH

Al Chubak

Utah has had a challenging year in 2016 and will continue to be a battleground in several areas.

For the last three years, the Utah Department of Agriculture Food & Drug (UDAF&D) has been active in documenting outbreaks of American Foul Brood (AFB). With their help, inspections of commercial and backyard beehives have shown that cases have dropped to only one in 2016.

Utah's boundaries were breached in 2008 by Africanized Honey Bees (AHB). A blockade of traps were placed by the UDAF&D at about Parowan, Utah, that appears to have withstood the northern advance. Another valley near Price, Utah, has shown signs that AHB may be routing through another valley. 2017 will show us if it is new or already established in that region.

Small Hive Beetle (SHB) has made rare appearances in Utah, despite the fact Utah is the main transportation corridor for commercial almond pollination in California. An inspection found one hive with SHB in Washington County in 2016. A delimiting survey of hives in the surrounding 2 miles was conducted with beetle traps; no further beetles were found. Utah's response is based on the New Mexico Apiary Program, which has a similar climate and has had issues with SHB.

Utah's beekeeping bill was changed this year, referred to House Bill HB0115 which deregulated beekeeping thereby allowing anyone with 5 beehives or less to not register. Mandatory registration was deleted from the bill. In a State where both commercial and backyard beekeepers share the same foraging locations, challenges are bound to materialize. The mandatory registration was added to Utah law in 1892 to combat AFB.

Utah currently has 1800 registered beekeepers, an increase of 200 in 2016. An unknown number are unregistered. Utah has two State Bee Inspectors: Joey Caputo and Stephen Stanko. 15 counties have their own inspector. The USDF&D beekeeping Director is Kristopher Watson.

Randy Oliver was invited by the USDF&D to speak to beekeepers at the University of Utah about Varroa.

Darrin Cox from Cache Valley, Utah sat as president of the American Honey Producers for the last two years.

Danielle Downey returned to Utah from working in Hawaii with the USDA, and is now with Project Apis M.

Officially Utah graduated its first Master Beekeeper, Natalie Thompson, in June thru the University of Montana.

Our oldest beekeeper is Olive Jones, now in her 92nd year. Olive and her husband were original members of the Western Apicultural Society.

Beekeepers' Calendar

Feb 3 - 4: New Mexico Beekeepers Association Annual Meeting: 'The Business of the Bee', South Broadway Cultural Center, 1025 Broadway Street SE, Albuquerque. Details <http://nmbeekeepers.org>.

Feb 24 - 25: Utah Beekeepers Association Convention, Hyatt Place Hotel, Lehi, UT. Info, visit <http://utahbeekeepers.com>.

Mar 3 - 5: 10th Annual Chemical-Free Beekeepers Conference, Oracle, Arizona. Info, contact Dee Lusby dealusby1@aol.com.

Mar 18 - 19: Wyoming Bee College Conference, 1400 E. College Dr., Cheyenne WY. Info www.eventbrite.com/e/wyoming-bee-college-conference-2017-tickets-27182621954?aff=erelexpmlt.

Apr 8: Olivarez Bees 9th Annual Hobby/Sideliner Day, Orland CA. Pre-ordered packages will be ready for pick-up. Info <https://www.ohbees.com/collections/hobby-day>.

May 5 - 6: California Honey Festival (Main Street, Downtown Woodland, CA). ACCEPTING VENDOR APPLICATIONS - by April 1st. <http://www.CaliforniaHoneyFestival.com>.

May 7: Bee Symposium, UC-Davis CA. Info honey.ucdavis.edu/events.

Sept 5 - 8: Western Apicultural Society 40th Anniversary Conference & Annual Meeting, UC-Davis Campus, Davis CA. Info www.westernapiculturalsociety.org.

Nov 14 - 16: California State Beekeepers Association annual convention, Harrah's/Harveys in Lake Tahoe, CA. Info <http://www.californiastatebeekeepers.com/events.html>.



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Baby Blue,
Dark Blue, Orange &
Dark Brown
100 caps / \$12
2000 caps/\$172



12 oz Glass Bear	12 Ct Lids included	\$11.75
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12 oz Glass Skep Jar	12 Ct includes lids	\$10.45
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9 fl oz Glass Hex	12 Ct lids included	\$10.75
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