WAS Journal

Journal of the Western Apicultural Society of North America

Volume 41 Number 2 May 2018

WAS Up! 2018 Conference | Fungi for Health | Honey Bee Nutrition

Bees in Hurricane Harvey | Queens in "Time-Out" | Bullying in Beekeeping

WAS Journal

Journal of the Western Apicultural Society of North America

Volume 41* Number 2 **May 2018**

Contents

Advertisers

*Given several discrepancies in numbering of past volumes of the *WAS Journal*, 2018 is based on WAS's 41st year.

Source: Michael Wayne Faircloth Sr., page 39. *Idaho Statesman*, March 8, 2018.

Western Apicultural Society of North America

www.westernapiculturalsociety.org | www.facebook.com/WesternApiculturalSociety

2018 Executive Committee

President
Steve Sweet
1720 Canova Dr
Boise ID 83706
208.850.3452
boisebeeman@gmail.com

Past President
Eric Mussen
1004 Anderson Rd
Davis CA 95616
530.758.4393
ecmussen@ucdavis.edu

1st Vice President
Joe Carson
7362 W Parks Hwy #305
Wasilla AK 99623
907.727.8200
dr.joecarson@gmail.com

2nd Vice President
Sarah Red-Laird
PO Box 3257
Ashland OR 97520
541.708.1127
sarah@beegirl.org

Secretary
Cyndi Smith
19909 122nd St E
Bonney Lake WA 98391
253.222.4906
onthegocgs@comcast.net

Treasurer
Sherry Olsen-Frank
PO Box 5274
Twin Falls ID 83303
208.735.5353
magicvalleybees@gmail.com

Member-at-Large
Jaylene Naylor
PO Box 411
Stevensville MT 59870
406.529.9174
jaylene.naylor@gmail.com

Regional Directors

Alberta
TBA

British Columbia
Nancy Burkholder
Box 249
Pritchard BC V0E 2P0 Canada
250.577.3410
b2wphoto@gmail.com

Saskatchewan
Doreen Bradshaw
2812 Fleury St
Regina SK S4N 2M4 Canada
306.761.0995
dbradshaw@myaccess.ca

Alaska
Joe Carson
(See 1st Vice President)

Arizona
TBA

California
Archie Mitchell
1520 N B Court
Lompoc CA 93436
805.291.3279
archibald_178@hotmail.com

Colorado
TBA

Hawaii
Noelani Waters
808.345.2894
noe.honeybee@gmail.com

Idaho
Steve Sweet
(See President)

Montana
Jerry Bromenshenk
200 Rimrock Way
Missoula MT 59803
406.544.9007
beeresearch@aol.com

Nevada
TBA

New Mexico
TBA

Oregon
Sarah Red-Laird
(See 2nd Vice President)

Utah
Albert Chubak
5033 S Commerce Dr
Murray UT 84107
801.654.9700
albert@ecobeebox.com

Washington
James K Smith
19909 122nd St
Bonney Lake WA 98391
253.222.4824
jksmithpe@comcast.net

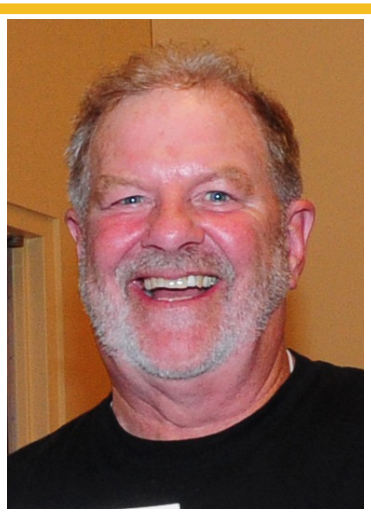
Wyoming
Catherine Wissner
620 County Rd 146
Carpenter WY 82054
307.649.2430
cwissner@uwyo.edu

Yukon
TBA

Journal Editor
Rosanna Mattingly
4207 SE Woodstock Blvd Ste 517
Portland OR 97206
503.772.3486
rosannamattingly@gmail.com

President's Message

April 12, 2018



With winter's transit once again in our collective rear view mirrors, we're reminded of life's wonder as the first wafts of the soft, earthy, musky, humid aromas rise up out of our hives and envelop our senses. The buzz of the mating yard, the incoming loads of pollen and workers full of nectar, the return of vitality as spring bursts forth all around us with the bees thriving and growing once again—these things all serve to awaken us as we share the same fascination with God's little flying creatures. Such a great time of the year!

Changes—So much has changed within WAS since we last met in Davis. Fran Bach, our beloved, long-term Editor and Historian, has followed through on her decision that the time has arrived to pass the torch. As of this spring, she now has more time to reconnect with her vast family up in Canada and is striving mightily to complete a thoroughly researched family history. Always the consummate planner, Fran had thought through this transition beforehand and offered a recommendation for her replacement.

For all of our members familiar with the Oregon State Beekeepers Association (orsba.org), our new Editor will certainly be a familiar face. Rosanna Mattingly, PhD, Editor for the OSBA *The Bee Line* since 2005, has agreed to take on the task as WAS Editor. For those of you who have yet to make Ms. Mattingly's acquaintance, you are in for a pleasant surprise. First, check out Rosanna's website here: www.beargrasspress.com/portfolio. *Honey-Maker: How the Honey Bee Worker Does What She Does* is a wonderful book that demonstrates Rosanna's in-depth knowledge and familiarity with this fascinating topic. The webpage also offers a number of other well-researched guides and cards. We are indeed fortunate to have someone as competent as Rosanna to help WAS spread our message.

As you know, last summer, Peggy Beckett decided to step away as a WAS Director. I am pleased to inform the membership that the Board has unanimously accepted Peggy's recommendation for her replacement. Ms. Noelani Waters, a graduate from the University of Hawaii at Hilo, recently served as an Apiary Specialist and Inspector for the Hawaii Department of Agriculture. Today, Noe has joined a VSH breeding lab and continues an exciting beekeeping career. When the opportunity arises, be sure to welcome Noe to WAS and wish her well. She's a great example of how beekeeping is changing these days—changing for the better, too.

Conference—Our upcoming conference is set for **Friday–Sunday**, **August 3–5**, when we will convene at the eclectic and unique **Jack's Urban Meeting Place** (JUMP) in **Boise**, **Idaho**. JUMP offers something for everyone, with a first-class conference room sporting floor-to-ceiling windows overlooking the Boise skyline and "state-of-the-art projection and sound systems," plus a spacious deck allowing the placement of hives right outside our conference room. Still under construction is a five-story slide from the top of the JUMP building to the ground floor. That ought to prove entertaining. Another unique offering to be found at JUMP is the late JR Simplot's antique collection of 50 vintage steam engines and tractors. (Free tours are available!)

As announced in the February 2018 *WAS Journal*, **Jennifer Berry** and **Randy Oliver** will lead off the weekend events—you want to be sure to catch these two. **Dr. Dewey Caron** will be sharing his wealth of knowledge with a presentation on "Varroa, Forage, Pesticides: Honey Bee Health Coalition Resources for WAS." Following Dewey, we'll have the "Two Jerrys of Beekeeping" (**Jerry Hayes** and **Jerry Bromenshenk**), who will update us on Bayer/Monsanto's current efforts to improve beekeeping (Jerry H) and provide a personal perspective addressing how much beekeeping has changed and is expected to continue to change over the foreseeable future (Jerry B). Closing out our regular Friday session, Jennifer and **Marc von Heune** will provide a perspective on "Beekeeping Behind Bars."

Friday evening, **Sarah Red-Laird**, the Bee Girl (who recently finished a feature stint at the Ashland Independent Film Festival), is planning another of her *Next Gen* sessions under the moniker of "The Future of Beekeeping is Ours!" Word has it that within 90 minutes of convening, the group is anticipated to embark on a *Pub Swarm* throughout Downtown Boise, led by the stalwarts of the local university Bee Team. Friday night in Boise (No. 1 on Forbes Fastest Growing Cities List for 2018) and the Next Gen bunch on the loose, watch out.

The 2018 Bayer Bee Care Young Beekeeper Award is in recognition of the next generation of beekeepers (12–18 years old) and their efforts to give back to their communities through beekeeping. These outstanding individuals have created unique projects on their own or with their local communities to promote and protect bee health for years to come. Each entrant has a chance to earn a $3,000 (first), $2,000 (second) or $1,000 (third) prize, which can be applied toward continuing their beekeeping efforts or a college scholarship.

bee care

Applications open on **March 15, 2018**, and entrants can apply online by **May 15, 2018**.

Visit www.BeeHealth.Bayer.us for more information.

BAYER

WAS Presidents

1978 **Norman Gary** (California)
1979 **Lucien Alexander** (Oregon)
1980 **Randy Barker** (British 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** (British 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)
2018 **Steve Sweet** (Idaho)

Bright and early the next morning, Sarah will lead off and provide an update on current "Education Programs, Research Projects, and University Collaboration on the Advancement of Saving Bees." Continuing to test the resiliency of the Next Gens to bounce back following a night of Downtown Boise Tomfoolery, immediately after Sarah's presentation, **Melinda Jean Stafford**, the current President of the local Treasure Valley Beekeepers Club, will share insights on helping young apiarists succeed in beekeeping.

Mid-morning on Saturday, Jennifer and Randy will don their gear and invite 20 or so young beekeepers to join them on the **outdoor JUMP patio, where a small apiary will have been set up**. For those who don't venture outside, the entire show will be visible through the ceiling-to-floor windows immediately nearby. To improve this experience for our indoor viewers, both Randy and Jennifer will be equipped with wireless mics so that they can narrate the entire show. (Hint: If you'd like to venture out with our headliners on this adventure, be sure to bring your veil and a long-sleeved shirt!)

Following the lunch hour, we'll open with an interesting and practical discussion, led by **Dr. Ron Bitner**, providing insights on "Bee-Friendly Farming: Ground Cover for Native Bees." Note that our annual banquet will be held later Saturday at Bitner Vineyards, and we'll be able to observe how this knowledge has been put into practice.

Dr. Jamie Strange, a USDA-ARS research entomologist based in Logan, Utah, will share the state of the art on bumble bee biology and practical aspects of bumble bee culture. Next, **Dr. Ramesh Sagili**, from Oregon State University, will provide information on honey bee nutrition and update on his activities with the Bee Informed Partnership. **Ellen Topitzhofer**, also with the Bee Informed Partnership, will close out the day with observations that she has garnered over the summer as a member of the Pacific Northwest Tech Transfer Team.

Sunday morning will open with a **panel discussion** focusing on various **Master Beekeeper Programs** available throughout the country. Our panelists will consist of Jennifer Berry (Georgia), Jerry Bromenshenk (Montana), Dewey Caron (Eastern Apiculture Society), and Ramesh Sagili (Oregon). Each panelist will briefly describe his or her respective master beekeeper program in the context of the ability to provide positive community outreach. Following the overviews will be a question-and-answer period allowing us to delve into the specific intricacies of the programs. If we are lucky, we will also have a panelist from California to provide insights on that new program. [See additional conference information, pages 22–27.]

Sunday will close with our **annual business meeting**. You'll all want to be present for that, as the adoption of the new Bylaws will be on the agenda—as will an announcement on a proposed new, simplified dues structure. This will be the time for those who desire to make the Future of Beekeeping Yours to step up and help guide this organization successfully to our 50th anniversary.

WAS Up!

Steve Sweet

Using Fungi to Improve Honey Bee Health

Nicholas Naeger, PhD & Jennifer Han, PhD—Washington State University, Pullman

The Washington State University bee research team has been developing new tools to help bees and beekeepers tackle the current disease issues. In addition to breeding honey bees well suited to the Pacific Northwest and continuing our honey bee disease and diagnostics work, the WSU team has been investigating novel uses of fungi for the improvement of bee health.

Fungi are perhaps the most hidden and overlooked group in the vast web of life that stretches across this planet. More closely related to animals than they are to plants or bacteria, fungi have been called the *unseen orchestrators of ecosystems*. Many fungi spend the vast majority of their lives hidden from view underground or inside plant material, and many other fungi like yeasts never grow large enough to be seen with the naked eye. They are vital decomposers allowing for faster recycling of nutrients back into the food web, and most land plants develop associations with symbiotic fungi in their roots. Microscopic fungi are used in commercial industry to make products as diverse as soft drinks, antibiotics, and blue jeans, and perhaps they will play a role in helping bees combat honey bee viruses and Varroa mites.

Two years ago, WSU professors Steve Sheppard and Lori Carris formed a collaboration with mycologist Paul Stamets and his company Fungi Perfecti LLC of Olympia, Washington. Stamets is well known for using fungi in innovative and creative ways to tackle issues of environmental importance. After noticing honey bees foraging in his mushroom patches, Stamets wondered if the bees were deriving nutritional or medicinal value from mushrooms. Using bees brought into the laboratory and housed in small cages, WSU tested if feeding bees fungal extracts had any effects on their health. In particular, the experiments focused on species of long-lived wood decay fungi that are known to produce antimicrobial compounds and have a history of use in traditional Chinese medicine. The results showed that feeding bees extracts from the Fomes or Ganoderma groups of mushrooms lowered the levels of honey bee viruses. Fomes had the largest effect on Deformed Wing Virus (DWV), and Ganoderma had the largest effect on Lake Sinai Virus (LSV). In both cases, feeding bees fungal extract reduced virus levels to less than 1 percent of the levels found in untreated cages.

Undergraduate research assistant Rodrigo Guizar collects honey bee samples for virus analysis during the almond bloom.

Jennifer Han and Nick Naeger, postdoctoral research associates at Washington State University, are conducting research on fungi and honey bees.

Similar results were found when the experiments were repeated outdoors using five-frame nuc colonies. Both fungi significantly reduced both viruses by at least 44x, and Ganoderma against LSV demonstrated a massive 45,000x reduction in virus levels. Following these very promising results, Fungi Perfecti then grew different strains of these fungi on different woods so WSU could test the best combinations for antiviral effects. Using over 500 colonies during California almond pollination, significant reductions in viral levels were once again found, but these results were largely obscured by a surprising discovery. Nobody before had ever measured virus levels repeatedly in the same colonies during the almond bloom, and the WSU research team found that it is not uncommon for virus levels to jump one millionfold up or down in only a two-week span of time. At this point it is unknown what factors made virus levels jump so wildly in those experiments. It could have been a result of the age and caste demographics of the hive in the spring; very old overwintering workers are being replaced with newborns, and the number of drones in the hive can vary greatly. It also cannot be ruled out that unknown environmental factors in the almond orchards are causing virus levels to fluctuate wildly. Washington State University and the USDA are currently analyzing experiments from last summer and fall, which will help inform best treatment practices with the fungal extracts against viruses as well as the basic epidemiology of honey bee viruses.

Washington State University has also made some exciting progress in the development of the fungus


Shastina Bee Girls
877-789-7526
Factory Direct Pricing!
Give Your Bees The Best!
Eco-Friendly Products
For All Of Our Products, visit ShastinaBeeGirls.com

Metarhizium as a biological control agent against Varroa. Starting about 15 years ago, the USDA and a few other labs around the world experimented with using fungal pathogens to kill mites in the hive. Unlike chemical treatments, biological control agents like Metarhizium and other fungal pathogens typically have less impact on nontarget insects like bees, and harmful residues are not left behind in wax or honey. It could be very important in future years for beekeepers to have a nonchemical alternative as Varroa continues to evolve resistance against miticides. Although early research showed that Metarhizium could infect and kill mites, there were problems with getting the fungus to work consistently. It became clear that this fungus, like many others, did not grow or survive well in the relatively warm conditions inside bee hives. Washington State University undertook the laborious challenge of trying to breed Metarhizium for increased virulence against Varroa and increased survivorship under hive conditions.

Metarhizium fungus growing out of Varroa mites collected from bottom board sticky cards.

The research team started the project by screening available commercial and experimental strains of Metarhizium for their ability to kill mites inside the hive. Treatment of hives with one particular strain of *Metarhizium brunneum* led to significantly higher rates of mite death compared to other strains or controls. However, this increase in mite fall was rather short lived with the treatment effect disappearing around 1–2 weeks. Using this strain as a starting place, WSU started an ongoing selection program for Metarhizium. Dead mites from treated colonies are collected off of bottom board sticky cards and cultured in Petri dishes to look for fungal growth. Spores are then grown from these cultures and used to treat the next round of hives. To make use of the winter time when field trials are not possible, WSU developed *accelerated evolution* techniques in the laboratory for Metarhizium. Using spores from the most-recent field trials, generations of the fungus were subjected to stressors while the temperature in the incubator was gradually ramped up to hive temperatures over months.

The following spring, first treatment of the hives with the fungus produced moderate results without improvement from the previous year. This was to be expected; most mutations are not beneficial to an organism, and selection is necessary to find and propagate individuals with advantageous mutations. Over the course of the year and four large rounds of treatment, WSU plated over 27,000 mites to look for the most highly infectious strains of fungus. By the fourth round of selection for the fungus, the number of mites killed per treatment had doubled. Perhaps most excitingly, the duration of the treatment appears to be extended in the new fungal strain. Rather than the fungus dying off within the first 9–13 days, the new strain continued to kill mites for over four weeks. Treatment and selection experiments will resume this spring. In addition to continuing the selection program for the fungus, experiments are planned to test methods of delivery such as strips, patties, or powders.

Bayer Care Young Beekeeper Award

Bayer has announced a nationwide call for the beekeeping industry's next generation of leaders, researchers, and change-makers to apply for the Bayer Bee Care Young Beekeeper Award [see page 8].

Last year, Bayer's Community Leadership Award program introduced a new award specific to young beekeepers, 18 and under, who applied for the funds to support honey bee-focused initiatives in their schools or communities. Based on the overwhelming interest and excellent quality of applicants, this year Bayer is shifting the program to focus solely on the next era of beekeeping. The Young Beekeeper Award will recognize the next generation and their efforts to give back to their communities through pollinator health and education.

As an initiative of the Bayer North American Bee Care Program, the Young Beekeeper Award allows entrants between the ages of 12 and 18 the opportunity to win $3,000 (1st place), $2,000 (2nd place), or $1,000 (3rd place) to support honey bee-focused initiatives in their schools or communities, or to help fund their college tuition.

For more information and to apply (application is online), please visit:

beehealth.bayer.us/young-beekeeper-award

The deadline for applications is **Tuesday, May 15**.

Honey Bee Nutrition

Part 6 of 6

Dale Hill, PhD, PAS—Quincy, Illinois

In previous articles, we have covered proteins, carbohydrates, and lipids for honey bees. In this sixth and final article, we will focus on the plants where the bees find their food and necessary nutrients.

Many plants produce nectar to attract bees and other insects for pollination. Bees harvest nectar from specialized plant tissues called *nectaries*. These specialized secretory glands (more of a functional tissue rather than a structural tissue) may be within the blossom (floral) or outside of the blossom (extrafloral).

The quantity of nectar produced is determined by plant species, soil conditions, adequate rainfall, weather, and good growing conditions. Nectar production by plants varies greatly, with some of the most prolific nectar producers being the tulip tree (*Liriodendron tulipifera*) flower and several species of lime (Tiliaceae). Six plant families provide most of the nectar for honey bees, including:

Rosaceae: rose family, includes most fruit trees
Fabaceae: legumes, black locust
Lamiaceae: mint family, includes most garden herbs
Scrophulariaceae: foxglove, figwort families
Brassicaceae: mustard family
Asteraceae: includes asters, cone flowers, thistles, dandelions

Some plants have multiple flowers on the same stem, so that a single plant may produce lots of nectar, with heather (*Calluna vulgaris*) being a prime example.

Sugar concentration in nectar will be quite variable in different plant species. Pear and plum nectars contain about 15 percent sugar. Marjoram (*Origanum vulgare*) may contain as much as 76 percent sugar. Bees prefer to gather nectar from the plants with the greater sugar content and usually don't collect much nectar from plants with less than 15 percent sugar. Nectars are normally a minor source of amino acids, lipids, vitamins, and minerals as compared to pollens.

Nectar collection and honey production are not always a continuous process. There are time periods when the weather is either too wet or too dry and/or too hot or too cold, which negatively impacts the plant's ability to produce nectar and pollen. These same conditions also limit bee flight activity (rain, excess heat, temperatures below 12°C (53°F) are examples).

Honey production proceeds well under ideal weather conditions, but may fall to zero (or honey consumption may be greater than honey production) during periods of nectar and pollen dearth (hot and dry summer, for example). Any weather factor that has a positive or negative impact on plants will have a similar impact on bees and honey production.

Very few bees will fly when wind is more than 25 kilometers/hour (15 miles/hour) as this is their normal flight speed. A tail wind may help them get farther from the hive in their search for food, but they may not be able to get back to the hive flying against the wind. Migratory beekeepers may have the advantage of being able to move bee hives greater distances when weather changes over time influence nectar flows. They can move colonies to areas of better forage when honey production in prior locations may be less than expected and/or bee colony survival may be at risk due to low food resources in a local area (Hurricane Harvey is devastating the Texas coastline as I write this article).

As a general statement, the bee lands on a blossom and extends its proboscis down into the blossom to find the nectar. In the process, its body comes into contact with the anthers and stamens of the blossom, and the pollen grains are transferred to the bee's body hairs. The bee then uses its antennae and front legs to transfer pollen to the pollen baskets on the hind legs. Foraging is done by older worker bees, and the number of foragers is secondary to the colony's need for young nurse bees to feed the brood and to maintain hive temperature in the brood area. The number of foragers has been estimated at roughly 50 percent and nurse bees at roughly 50 percent of the hive population (drones are roughly 1 percent).

Most flowering plants produce new blossoms each day within their specific life cycle. When we plan for pollinator areas, we must consider each plant's blooming times. We should utilize a variety of plants so that several plant species that bees favor will be in bloom from late March through late October (these dates will vary by North-South latitude). Some plants have blossoms open most of the day, while other plants have open blossoms for a few hours in the morning or in the evening, and this may be somewhat dependent on weather factors. In North America, the US

Department of Agriculture, regional universities, regional botanical gardens, and most seed companies can provide you with growing zone information and suggested plant combinations for your local area to cover the entire growing season.

Most plants will be in bloom during a specific 2–4-week period during the growing season. Not all plants of a species will be in bloom at the same time. Honey bees forage on available plants, normally within a 1 mile radius of the hive, but have been documented to fly as far as 7.5 miles under extreme barren desert conditions. A radius of 1–3 miles, with extreme outer limits of 5 miles, is more commonly documented. This area is not a circle, but is irregular based on trees and terrain, with bees generally passing over land that is in shadows as they fly from their hive.

Honeydew is a sugar-rich liquid secreted by plant-sucking aphids, lachnids, and coccids, and is collected by bees to produce a dark strong honey. Honeydew availability is determined by the many factors that influence population dynamics of the honeydew-producing insects, especially weather. This may be a significant food source for bees in some coniferous (pine, juniper, evergreens) forests. In some areas of the world, honey produced from honeydew is more common than nectar-produced honey. Periods of high honeydew usually do not occur at the same time as high nectar/pollen production from plants, so collected pollen or supplemental feed may need to be fed to maintain reproduction and growth of the colony.

Plant sap from harvested sugar cane stumps may also be collected by bees. During cane harvest, bees may collect more sap than they can process into honey as thoroughly as they can when the sap flow is less abundant. Some beekeepers use this honey only for refeeding, and not for marketed honey. Sap from maple trees tapped for syrup is usually a poor sugar source (1.5–5 percent sugar) and is harvested in very early spring before the weather is warm enough for the bees to fly. Bees generally cannot puncture the skins of fruit, so only damaged fruit may be attractive to bees as a sugar source.

Pollens are the male gametes (sperm cells) of plants found in blossoms. Pollen provides most of the protein (amino acids), vitamins, minerals, and lipids needed by bees for reproduction and growth. With limited pollen or complete lack of pollen, a bee colony will not starve immediately (or starve as fast as when there is loss of nectar and stored honey), but rather the colony will die slowly because it cannot feed larvae to raise new bees to replace those that die.

Often in a pollen shortage, nurse bees may resort to cannibalism of young eggs and larvae for protein to maintain the queen. This may also occur with extended foraging on single pollen sources that do not provide adequate amino acids in the amounts and ratios needed by bees for reproduction and growth. Watch for new eggs and young larvae during periods when pollen may be short. Very low or no eggs and young larvae are a good indication of colony distress, and supplemental protein feeding may be needed. *The Hive and the Honey Bee* (Chapter 12) is required reading for any student of nectar and pollen production by plants and utilization by honey bees.

It is impossible to cover all geographic areas for readers in this article. There is an excellent discussion of North American plants for honey bees in Chapter 13 in *The Hive and the Honey Bee*. *Garden Plants for Honey Bees* by Peter Lindtner should be in every beekeeper's library. This book is organized by month, describes plants that bloom from February through November, and provides an indication of nectar production and pollen quality for each plant listed. *American Honey Plants* by Frank Pellett is another good book that provides an alphabetical listing of plants, descriptions, general growing conditions, and general comments about nectar and pollen production.

For international information on plants, I use books edited by Dr. Eva Crane. Dr. Crane was the Director of the International Bee Research Association from 1949 until her retirement in 1983. Unfortunately, many of her books are out of print, hard to find, and are expensive when you do locate copies. I'm fortunate to have found some of her books, but I did pay dearly for them. I make no claims as a horticulture or plant specialist, so her books are some of my frequent references on this topic.

As a general statement, most angiosperms (flowering plants) are pollinated by insects, and these pollens provide most of the nutrition for bees. Mixtures of pollen from various plant species are much more useful for providing the essential nutrients in the appropriate amounts for bees rather than pollen from a single source (almost always deficient in some needed nutrients). Most of the major agricultural grain crops are in grass families and are wind pollinated (corn, barley, grain sorghum, oats, wheat, and rice are examples). Bees generally don't forage on these grains or grasses unless there is a pollen shortage from flowering plants due to weather or other factors. Late-fall foraging on buckwheat is an exception, but commercial buckwheat production has

been shrinking in recent years.

Land use is the major factor on what plants are available for insect foragers—there will be fewer flowering plants available for insect foraging in areas of intensive agricultural crop production. In my agriculture crop production classes from many years ago, the definition of a weed was "a plant out of place," so any plant that is not one of the specific crop being produced is usually considered a weed, and weed control is a big part of agricultural crop production practices.

Learning what plants are important for honey production in your geographic area is time well spent.

References

American Honey Plants. Frank C. Pellett. 1976. Fifth Edition. Dadant & Sons, Hamilton, Illinois.

Bees and Beekeeping: Science, Practice and World Resources. Edited by Eva Crane. 1990. Cornell University Press, Ithaca, New York. Chapter 12 and Appendix 1.

Garden Plants for Honey Bees. Peter Lindtner. 2014. Wicwas Press, Kalamazoo, Michigan.

Honey: A Comprehensive Survey. Edited by Eva Crane. 1976. William Heinemann Ltd, London. Chapter 1.

The Hive and the Honey Bee. Edited by Joe Graham. 2015. Dadant & Sons, Hamilton, Illinois. Chapters 12 and 13.

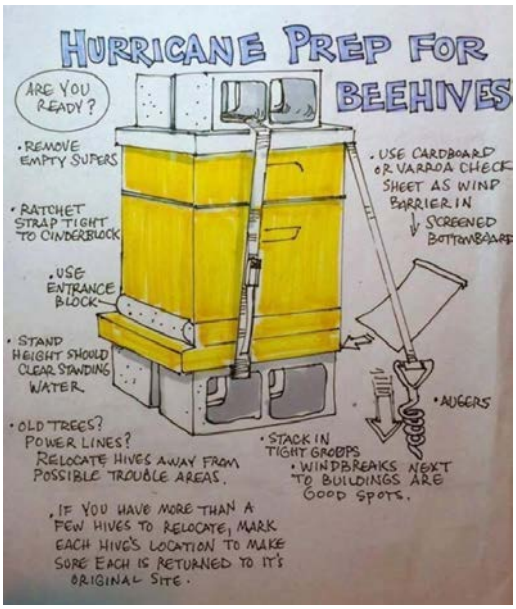
Before, During, and After Account of Hurricane Harvey

The Beekeepers' Perspective

Shelley Rice—Bellaire, Texas

"Houston is a great fit for honey production because of Tallow trees, but bad when it comes to hurricanes," said Blake Shook, a director for the American Beekeeping Federation. Shook spoke prophetically in January 2017 at the ABF Annual Conference in Galveston, Texas. Among those in the audience were Shelley Rice and Nicole Buergers, urban beekeepers from Houston. Little did both women know that in less than eight months they would be tested by Hurricane Harvey, the largest hurricane storm system to hit southern Texas since 1970.

In August 2017, Harvey pummeled the Texas Gulf Coast dumping in a year's worth of rainfall in mere days. The following is the dual account of the sister beekeepers' experience before, during, and after the storm as they tended to their bees, homes, and neighbors amidst a natural disaster.



Hurricane preparedness means do what you can.

For the three days prior to Harvey's arrival, both Rice and Buergers—along with other Houstonians—carried on as usual. The total solar eclipse was scheduled to occur, and most of North America was abuzz with excitement. The women checked weather updates, but moved through their typical routines. As urban beekeepers on the Gulf Coast, they were busy discussing the latest Varroa mite findings, pulling honey supers, and even looking forward to a little rain ahead of the fall honey flow.

"No one is too concerned about a storm until they are certain of impact," said Buergers. "And even then, an air of nonchalance and denial is often mixed in with preparation."

On August 24, it became clear that Harvey was Houston bound. Both beekeepers began implementing their hurricane preparedness plans, which included various methods of securing and elevating the hive boxes. This was no meager task as Rice had over 70 hives to prepare, and Buergers had 40. While most of their neighbors stocked up on bottled water and batteries, beekeepers like Rice and Buergers were stocking up on concrete pavers and straps.

Rice added extra boxes to her hives, and strapped them down, adding weight and space for encased bees to breathe and cool. Buergers weighed her boxes with heavy paving stones, lifted them on cinder blocks, and also tied them down with straps.

As the storm made landfall on August 25, both women were still busy tending to hive preparation as well as personal home preparation. "I had spent the entire week getting the hives ready. I hadn't even prepped my own house for the storm," said Rice. "I headed to the store to pull together dinner and supplies."

By this time, local media sources were beginning to report grocery store shelves being emptied of bottled water, and plywood for boarding windows was the fastest thing to fly off hardware store shelves.

Over the next three days, thunderstorms dumped rain over Houston and numerous tornadoes made landfall throughout the area.

On August 26, Rice was contacted by a client whose beehive was toppled by a tornado, but still had bees contained within as the heavy rains poured on. Stranded at her own home 66 miles away from this client, Rice advised them to cover the hive with a tarp to protect the bees from more rain and waited in anticipation for updates from them and other clients.

As the days crept on, the phone calls came, many bringing devastating news. Hives had been submerged, tipped and carried away in the rising waters, or


Hives were carried away by wind and water.

blown over by tornadoes or high winds.

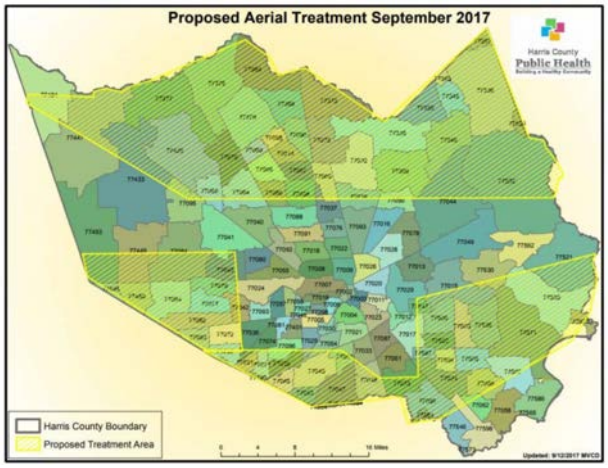

Rice moved beehives four times over a 48-hour period to keep them from drowning.

Rice echoed many of her fellow beekeepers: "I felt at a loss because I couldn't do anything about the situation," she said. Her own home was an island with water covering the drive, and surrounding homes had 3–6 feet of water on the interior. Her six front yard beehives were moved four times over a 48-hour period to help prevent them from drowning.

As waters began to recede throughout the area, both Rice and Buergers began making their way to hives around town for inspection. What both women reported was the astounding intellect of the bees themselves, who had already begun their post-Harvey rebuild. Many bees were lost indeed, but the bees that survived had begun to move their larvae up in the hive boxes and had begun to clean the messes below. Rice reported that, in one of her hives, a queen had already begun laying more eggs where workers had finished their cleaning.


On inspection after the storm, bees had already begun their post-Harvey rebuild.

Like beehive EMTs, Rice and Buergers began the process of replacing boxes, bottom boards, and damaged frames hive by hive. Little did they know that they were not out of the woods just yet. On September 5, aggressive mosquito spraying began within the city limits of Houston. It started with trucks driving up and down streets. Then, Harris County began notifying neighborhoods of the spray routes on the *day-of*, which gave no time for beekeepers to protect their hives. Adding to the lack of notice, Rice said this was the first time she had needed to shield hives from mosquito spraying. The Texas Chief Apiary Inspector sent out a notice to beekeepers statewide on September 13 about the United States Air Force deploying C-130H Hercules tactical cargo aircraft to spray more than 6 million acres with chemicals in the Greater Houston area. The Air Force stated it would spray the chemical called *naled*, but not in amounts large enough to affect human health. Naled is banned by the European Union and also Puerto Rico. It is found to have adverse health risks in humans, and can kill bees in an instant. At this point there were only 36 hours to prepare for the spraying.



Greater Houston area of naled spray following Harvey.

Both women decided to cover what hives they could get to in time with pop-up tents to keep the spray from settling on the hive boxes. Buergers placed dampened sheets and tarps over several hives in addition.

On the night of September 14, a parent at Lamar High School FFA apiary, where Rice is the volunteer beekeeping teacher, devised a misting system. The hope was that the bees would fly through the mist to wash off any naled insecticide before entering the hive.

When the spraying had subsided by September 17, Rice and Buergers were pleased to find that their efforts had been effective and the bees that had weathered the storm had also made it through the spraying. Though there were massive setbacks, Mother Nature had once again proven herself resilient and all was not lost.

Buergers offered three tips for beekeepers who may be preparing for a hurricane in the future:

1. **Elevate even higher**. There's a fine line between elevating off the ground and raising hives too high, increasing risk of tipping over in high winds. But for hives in low-lying areas or in a floodplain, a strong, high base in necessary.
2. **Bore drainage holes**. Beekeepers are already drilling holes in boxes for oxalic acid treatments, and

these can be just as effective in having water drain and helping oxygen levels in a hive.

3. **Provide bee escapes/top entrances**. If things get too dicey, this would give colonies the option to abscond. This will also provide additional ventilation in hot temperatures.

About the Beekeepers

Shelley Rice (otherwise known as *The Bee Lady*) has gleaned a plethora amount of knowledge and experience from her 10 years of bee keeping. Shelley loves *all* aspects of it, and it is truly her passion. She educates and brings awareness to the important role bees have on our existence and planet. Among the many bee-related adventures, she also privately manages commercial and residential hives throughout the greater Houston area and surrounding counties. Shelley created and oversees the Lamar High School FFA Beekeeping Program, and also works very closely with Discovery Green and McGovern Centennial Gardens in Hermann Park managing their hives and presenting education to the public. For more information, like and follow her Facebook page: All Things Bees Texas.

Nicole Buergers is an urban beekeeper and cheesemonger. In 2015, she left her B2B digital marketing career and founded Bee2Bee Honey Collective, providing beekeeping services and hyperlocal honey to the Houston area. Her mission is to create knowledgeable, small-scale beekeepers and provide honey bee education to the general public. She currently manages beehives at almost 20 residential and commercial locations. Bee2Bee honey and honey infusions are found in retail shops, restaurants, pop-up markets, and online at: www.bee2beehoney.com. A frequent public speaker, Nicole is a member of the Houston Beekeepers Association, Houston Natural Beekeepers Association, Harris County Beekeepers Association, and the Texas Beekeepers Association.

WAS UP! 2018 WAS Conference Venue

Conference Sessions

Jack's Urban Meeting Place (JUMP), the site of this year's WAS Conference, is located in the heart of downtown Boise, between Front and Myrtle Streets and 11th and 9th Streets.

jumpboise.org

Jack's Urban Meeting Place
1000 W Myrtle St
Boise, Idaho 83702
208.639.6610
assist@jumpboise.org

Additional information: Boise Metro Chamber of Commerce
208.472.5205; info@boisechamber.org; boisechamber.org

Parking

On **Thursday** and **Friday** (first day of Conference)

*9th & Front Street Parking Garage.

*10th & Front Street Parking Garage.

*JUMP Parking Garage, on Myrtle Street between 11th and 9th Streets. Levels 3 & 4.

$3.00/hour. $15 Daily Maximum.

On **Saturday** and **Sunday**

*JUMP Parking Garage, on Myrtle Street between 11th and 9th Streets. Below ground and levels 3 & 4.

$3/hour. $6 Daily Maximum.

Accessibility

The JUMP facility is fully accessible, and accessible parking is available on site for all who may utilize this service. Please view the JUMP Building Map to locate accessible parking spaces or call 208.639.6610 for additional information.

2018 Bee Buzz

This year's Bee Buzz will be held at the Woodland Empire Ale House, 1114 W Front Street, right across the street (northwest) from JUMP. We'll plan on visiting and networking at Woodland on Thursday, August 2, between 6 PM and 8 PM. A small restaurant next door will be available for food if you should desire.

Conference Banquet

The Conference Banquet will be held out in Caldwell at:

Bitner Vineyard
16645 Plum Rd
Caldwell, Idaho 83605

This is a 45-minute drive from downtown Boise. Over half the road is interstate, and the bulk of the remainder is relatively straight and easy driving.

The banquet dinner will be catered by Brick 29 Bistro from Nampa, Idaho. At the suggestion of one of the Next Geners, we will be enjoying a locavore meal, while we overlook the breathtaking Snake River Valley. Here's a little background on our Chef, courtesy of his web page: Dustan opened Brick 29 in May of 2007, and since then Brick 29 has had glowing reviews from *Idaho Statesman*, *Idaho Press Tribune*, the *Boise Weekly*, *The Scene,* and local papers (including the Ontario paper). Dustan has been written in periodicals including *Big Sky Journal*, *Wine Press Northwest*, and even in the *Wall Street Journal* as a chef preparing a wine dinner in a museum.

Here's what the Idaho Wine Commission says about Bitner Vineyard: The Bitners produce 1000-plus cases of hand harvested and hand crafted wines from their Estate Grown Grapes planted since 1981. Located in the Sunnyslope Region of the Snake River Valley AVA, Bitner Vineyards' deck and picnic area views are the perfect setting to experience Idaho wine country! The winery tasting room on Plum Road sits atop high volcanic ash and old lake bottom sediment soils. The site consists of a high mountain desert climate with hot summer days, cool evenings, and low rainfall, resulting in long hang times that give intense fruit forward and well balanced wines from these estate blocks. Come meet Ron and Mary and enjoy their fine wines and hospitality in the heart of wine country in Southwestern Idaho.

Conference Hotels and Dining

WAS has reserved a block of motel rooms three blocks (.16 mile) from the JUMP facility at:

Safari Inn
1070 W Grove St
Boise, Idaho 83702
208.344.6556
www.safariinndowntown.com

Call **before July 2, 2018**, to reserve rooms between August 2 and August 6.

Special daily room rates are as follows (rates below do not include 13 percent room tax):

$104.00 One queen bed one or two people

$119.00 One king or two queen beds

Amenities
Continental Breakfast 6 AM–10 AM
High Speed Internet (wired & wireless)
In-room refrigerator, microwave, coffee maker, and safe

Meal Options

Breaks during the conference sessions will provide drinks and snacks.

All your other food/meals will be on your own.

There are a number of great eating establishments within a block or two of the conference location at JUMP. The list in the table below provides some of the recommended sites that are very close to the venue.

Additional Hotels in Vicinity

Hotel 43 (.10 mile to JUMP)
981 W Grove St, Boise, Idaho 83702
208.342.4622; www.hotel43.com
"Modern hotel with free shuttle service, parking & Wi-Fi, plus a sleek steakhouse & bar."

The Grove Hotel (.16 mile to JUMP)
245 S Capitol Blvd, Boise, Idaho 83702
208.333.8000; www.grovehotelboise.com
"Polished hotel with a spa, a fitness center & indoor pool, plus a restaurant, & 2 bars."

The Modern Hotel and Bar
1314 W Grove St, Boise, Idaho 83702
208.424.8244; www.themodernhotel.com
"Hip lodging with sleek rooms, free continental breakfast & a buzzy bar with creative eats."

Hyatt Place Boise/Downtown (.35 mile to JUMP)
1024 W Bannock St, Boise, Idaho 83702
208.991.5275; www.boisedowntown.place.hyatt.com
"Relaxed downtown hotel offering modern rooms & suites, plus an outdoor pool & a free area shuttle." Plus restaurant.

Inn at 500 Capitol (.28 mile to JUMP)
500 S Capitol Blvd, Boise, Idaho 83702
208.227.0500; www.innat500.com
"Modern rooms & suites in a polished hotel featuring a chic restaurant & a 24-hour gym."

Establishment	Address	Bkfst	Lunch	Dinner	Notes
Chandlers	981 W Grove St			Y	Located in Hotel 43
Metro Cafe	981 W Grove St	Y			Located in Hotel 43
Goldy's Breakfast Bistro	108 S Capitol Blvd	Y			Get there early – popular
Big City Coffee	1416 W Grove St	Y			Good reputation
Bonefish Grill	855 W Broad St		Y	Y	Very close
Meraki-Greek Street Food	345 S 8th St		Y	Y	Close by
Solid Grill and Bar	405 S 8th St			Y	Close by
Fresh Healthy Cafe	860 W Broad St		Y		Close by
P.F. Chang's	391 S 8th St		Y	Y	Close by
Bar Gernika	202 S Capitol Blvd		Y	Y	Authentic Basque food
Caffé D'arte	794 Broad St	Y			Vegan
Five Guys	321 S 8th St		Y	Y	Basic burger
Woodland Empire Ale	1114 W Front St		Y	Y	Brew pub/restaurant next door

Tentative Conference Schedule

	Friday, August 3	Saturday, August 4	Sunday, August 5
8:00 AM	Registration/Check In	Registration/Check In	WAS Directors Meeting
8:15 AM			
8:30 AM		Opening	
8:45 AM		**Sarah Red-Laird** My Two-Step Plan to Saving Your Bees	
9:00 AM	Opening		Opening
9:15 AM	**Jennifer Berry** Varroa: A View that Only Jennifer Can Provide		Master Beekeeper Programs: Traditional Versus Flipped Classroom Learning Models **J Berry, J Bromenshenk, D Caron, R Sagili,** and California Rep
9:30 AM		**Melinda Jean Stafford** Relevancy: Local Associations and the Next Generation	
9:45 AM			
10:00 AM			
10:15 AM	Break	Break	Break
10:30 AM	**Dewey Caron** Varroa, Forage, Pesticides: Honey Bee Health Coalition Resources for WAS	**Jennifer Berry & Randy Oliver** Working the "Bugs"	WAS Annual Membership Meeting
10:45 AM			
11:00 AM			
11:15 AM			
11:30 AM	Lunch (on your own)	Lunch (on your own)	
noon			Adjourn
1:00 PM	Intro	Intro	
1:15 PM	**Randy Oliver** Hot Topic(s) of the Moment!	**Ron Bitner** Bee-Friendly Farming: Ground Cover for Native Bees	
1:30 PM			
1:45 PM			
2:00 PM			
2:15 PM	**Jerry Hayes** First World Confirmation Bias	**Jamie Strange** Bumble Bee Biology and Practical Aspects of Bumble Bee Culture	
2:30 PM			
2:45 PM			
3:00 PM			
3:15 PM	Break	Break	
3:30 PM	**Jerry Bromenshenk** Changes in Beekeeping---A Backward Look into the Future	**Ramesh Sagili** Honey Bee Nutrition: What We Know and What We Need to Know	
3:45 PM			
4:00 PM			
4:15 PM		**Ellen Topitzhofer** Bee Informed Partnership's Northwest Tech Transfer Team	
4:30 PM	**Marc von Heune & Jennifer Berry** Beekeeping Behind Bars		
4:45 PM			
5:00 PM	Next Gen **Sarah Red-Laird** The Future of Beekeeping is Ours: Interactive Happy Hour for Next-Generation Beekeepers	Travel to Vineyard	
5:15 PM			
5:30 PM			
5:45 PM			**Thursday, August 2** Bee Buzz @ Woodland Empire Ale Craft Brew Pub (across the street from JUMP)
6:00 PM		No-Host Social at Bitner Vineyard	
6:30 PM	Pub Swarm (start @ Woodcraft Brew Pub) | Dinner About Town		
6:45 PM			
7:00 PM		WAS Annual Banquet Bitner Vineyard (Locavore, Brick 29)	
until . . .			

Note: More about the conference in the next issue; **updates** at: www.westernapiculturalsociety.org. **Exhibitors/Sponsors**, contact Steve Sweet: boisebeeman@gmail.com. **Advertisers**, contact Rosanna Mattingly: rosannamattingly@gmail.com.

Western Apicultural Society of North America Inc

41st Annual Conference

Boise, Idaho ~ August 3–5, 2018

REGISTRATION FORM

Please print clearly!

Name(s): _____
As desired on name tag(s)

Mailing Address: _____
Street/Box Number

City: _____ State/Province: _____ Zip/Postal Code: _____

Phone: _____(cell/mobile) _____(home) e-mail: _____

Conference Rates[1]	Cost/Person	x Number	=	**Total**
Full Registration (before June 30, 2018)[2]	$175 US	x _____	=	_____
Delayed Full Registration (after June 30, 2018)	$225 US	x _____	=	_____
Single Day Registration Saturday	$90 US	x _____	=	_____
Single Day Registration Sunday	$90 US	x _____	=	_____
Attending Bee Buzz (how many?)		x _____		
Locavore Banquet @ Bitner Vineyard				
Falls Brand Pork Loin	$50 US	x _____	=	_____
Fresh Veggie Lasagna	$50 US	x _____	=	_____
Dues (from below)			=	_____
TOTAL AMOUNT ENCLOSED[3,4]				$_____

Dues (not required for attendance)

Individual	$20 US	_____
Couple	$30 US	_____
Junior (<21 years)	$15 US	_____
Senior (≥65 years)	$15 US	_____
Senior Couple	$20 US	_____
Association	$20 US	_____
Commercial	$100 US	_____

10 Year		
Individual	$200 US	_____
Couple	$300 US	_____
Benefactor	$500 US	_____
Patron	$1,000 US	_____

Print Journal	$20 US	_____
Digital Journal	—	

Dues/Journal (please add in the conference form above and attach WAS Membership Form) $_____

[1] **Full Conference Package** includes Bee Buzz, speaker sessions, and beverage/snack breaks.

[2] Early registration forms and payments must be postmarked no later than **June 30, 2018**.

[3] Payments in US funds only with check or money order made out to **Western Apicultural Society**.

Mail to: WAS Treasurer, Sherry Olsen-Frank

PO Box 5274, Twin Falls ID 83303-5274

or **Register Online** at **www.westernapiculturalsociety/conference** with debit/credit card.

[4] Full refund if cancellations received by **July 15, 2018**. No refunds after that date or for no shows.

More Fun in Boise

For all who are attending the 2018 WAS Conference, Boise offers access to a wealth of opportunities for exploration and discovery, including Outdoor Beauty, Trails, and Parks, Museums, Historic Sites, Sacred and Religious Sites, and Shopping. Among attractions posted are:

- Boise River Green Belt Hiking Trails
- Kathryn Albertson Park
- Idaho Anne Frank Human Rights Memorial
- World Center For Birds of Prey
- Julia Davis Parks, Gardens
- Old Idaho Penitentiary
- Idaho Botanical Garden
- Basque Museum & Cultural Center
- Albertsons Stadium
- Idaho State Capitol Building
- Ridge to River Trail System
- Morrison-Knudsen Nature Center
- Bogus Basin Mountain Recreation Area
- Camel's Back Park
- Cultural and Food Tours
- Boise Train Depot
- Zoo Boise
- Discovery Center of Idaho
- Hyde Park

For additional listings and to plan ahead, visit:

www.tripadvisor.com/Attractions

Beekeeper's Calendar

May 5. **California Honey Festival**. Downtown Woodland. *Information*: 530.668.8839; vendors@californiahoneyfestival.com or californiahoneyfestival.com.

May 20. **Trifecta Bee Event** (9:30 AM–4:30 PM). *Information*: http://www.brushymountainbeefarm.com/trifecta-beekeeping-event.

May 20. **World Bee Day**. *Information*: www.worldbeeday.org.

June 18–24. **National Pollinator Week**. *Information*: pollinator.org/pollinator-week.

July 11–13. **Heartland Apiculture Society's 2018 Missouri Conference**. Washington University, St. Louis. *Information*: www.heartlandbees.org.

August 3–5. **Western Apicultural Society 2018 Conference**. Boise, Idaho. *Information*: www.westernapicutralsociety.org.

August 13–17. **Eastern Apicultural Society Conference**. Hampton Roads Convention Center, Hampton, Virginia. *Information*: www.easternapiculture.org/conferences/eas-2018.html.

October 26–28. **Oregon State Beekeepers Association Fall Conference**. Salem Convention Center, Salem, Oregon. *Information*: orsba.org.

November 13–15. 2018 **CSBA Annual Convention**. Harrah's Resort Southern California. *Information*: www.californiastatebeekeepers.com.

January 8–12. **2019 American Beekeeping Federation Conference & Tradeshow**. Sheraton Myrtle Beach & The Myrtle Beach Convention Center, Myrtle Beach, South Carolina. *Information*: www.abfnet.org/?

Put your Queens in "Time-Out" to Improve Varroa Control

A Method Widely Used in Italy

Brandon Hopkins, PhD—Washington State University, Pullman

Beekeeping is a fun and fascinating hobby for many people and can be a valuable source of income for others. Learning about bee biology, behavior, and social systems can keep people captivated for many years. However, it is now imperative that beekeepers also learn about the Varroa life cycle and basic biology as in integral part of their honey bee education. With a basic understanding of Varroa biology, beekeepers can take advantage of the Varroa life cycle to improve mite control. When Varroa mites are not inside capped brood reproducing, they are hitching a ride on adult bees or crawling around looking for brood cells that are about to be capped. They are the most susceptible to miticides during this phoretic stage.

There is no effective miticide that can kill Varroa while they are inside the capped brood cells. Many products attempt to get around this constraint by either developing slow-release mechanisms like ApiVar or multiple treatments like oxalic acid. On the other hand, all registered miticides are very effective at killing Varroa mites while they are phoretic. Because of this, it is very important to take advantage of opportunities when colonies are without brood to treat for Varroa mites.

There are some key opportunities when colonies are naturally broodless that provide an excellent chance to get great Varroa control: packages, swarms, broodless splits, and in some cases winter clusters (before winter solstice). However, the swarms, packages, and splits are generally early in the season and don't apply to established colonies, and winter treatments are often far too late to save established colonies that are heavily infested. Most critical treatments need to happen shortly after the honey crop is removed and before they start to produce their winter bees (September–October), and colonies have a lot of brood at this time.

This is where queen caging can be a very useful tool to improve Varroa mite control. Queen caging prevents the queen from laying and forces the colony to become broodless. This can be done before, during, or shortly after the honey supers are removed with little to no effect on honey production. It is important to use the proper queen cages for this technique. Ideally the cage should be constructed out of queen excluder material so that workers can access the queen to care for her and spread her pheromones (prevent supersedure), but the queen cannot have access to the comb. There are a few excellent published studies on the technique (Gregorc et al. 2017; Giacomelli et al. 2016), and they clearly demonstrate how much more effective treatments are when they are combined with queen caging. Our experience with queen caging was presented at the 2017 OSBA Fall Conference. We compared the use of queen caging combined with oxalic acid dribble with oxalic acid dribble alone. The colonies we chose were heavily infested and showed clear signs of Varroa damage in the brood. All hives treated with queen caging + oxalic acid dropped below treatment threshold for Varroa. Hives treated with oxalic acid without queen caging maintained deadly levels of Varroa mites with very little chance of making it through the winter.

Back to the importance of understanding Varroa life cycle and how the relationship with the timing of queen caging is a critical component to its success as a Varroa control method. For example, Varroa infest brood cells at day 8 just before the cell is capped. Drone brood takes 24 days to emerge. The queen needs to remain in the cage for a minimum of 17 days, then the treatment will have to go in exactly one week later. Not before, because there could still be capped drone brood, and not later, because brood cells will start being capped and Varroa crawling in 8 days after releasing the queen. The queen can be caged for longer to increase the window of time you have to apply the treatment. For example, you could cage the queen for 24 days, then you could treat the same day you release the queen or any time in the next 7 days. Of course, the longer the queen is caged, the greater the loss of brood production and the increased risk of supersedure.

Every beekeeper's calendar and availability to work colonies is different, and the timing has to be worked out to fit each individual operation, but the technique provides flexibility and dramatically increases the effect of your mite treatment.

References

Gregorc, A., Alburaki, M., Werle, C. et al. 2017. Brood

removal or queen caging combined with oxalic acid treatment to control Varroa mites (*Varroa destructor*) in honey bee colonies (*Apis mellifera*). *Apidologie* 48: 821. https://doi.org/10.1007/s13592-017-0526-2.

Giacomelli, A., Pietropaoli, M., Carvelli, A. et al. 2016. Combination of thymol treatment (Apiguard®) and caging the queen technique to fight *Varroa destructor*. *Apidologie* 47: 606. https://doi.org/10.1007/s13592-015-0408-4.

Bullying in Beekeeping

Lack of Compassion and Extreme Arrogance Among Beekeepers Borders on Fanatical Intolerance—Tribalism

Al Chubak—WAS Utah Regional Director, Murray, Utah

Bullying is not just exhibited by students, it may be the office mate who you wish would just quit. Bullying is a form of control where the instigator is wanting to usurp power or force an ideology on another person. Society as a whole sees differences as not necessarily bad, evil, or corrupt—just different. What is good for one is not always good for all. One thought, method, practice, application is rarely universal as many situations can exist that need variation. In beekeeping, many think one system or practice or belief should be universal and should not be questioned. Many beliefs are shared in books written by those in the bee world that claim to be the "way it is." However, beekeeping is a regional thing, and adaptation to the environment, local conditions, personal limitation, and needs all play a part in what method, hive, system, or application is, will, or could be used. Regularly there are posts where the "all-knowing" seasoned beekeeper will share his or her "word" on what should be followed in relation to a hive type. Many times, this insight is not wanted nor sought, but comes and can be critical and demeaning. Bullying in any form is ignorant and short sighted, and displays character weakness and faults.

Historical Development and Where We Are

There was a time beyond our days when the craft of beekeeping was excitingly new, and almost anything was accepted, tried, and even patented. Every thought, idea, method, and structure was detailed and submitted for a patent number, then labeled and accredited as a *patented beehive*. As the beekeeping ideas were tried, slowly some faded away. Many of those ideas are now lost, and the equipment that was carefully designed then is now rotted and has been worm excrement for a century or more. The victor in the battle of the 19th-century beehives was Lorenzo Langstroth's hive. It was the simplest design with the greatest commercial potential. This hive, though, did not meet every beekeeping need then or now, so other systems and styles have evolved.

Joining an Extended, Partially Intolerant Family

Today there are about 800 beekeeping associations nationally in the US. According to the USDA, in October/December 2017 there were 3,032,060 commercial honey bee colonies in the United States (http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1943). Additional undocumented colonies exist in hobbyist apiaries, increasing that total significantly. An estimate on the number of beekeepers in the US is quite elusive, but is believed to be about two million. Many beekeepers are private in how they manage their colonies, yet others are quite outspoken. The adage, "Ask ten beekeepers a question, you'll get ten answers," is quite realistic. With the advent of social media, many have sought their beekeeping enlightenment via venues like YouTube and Facebook. Those joining the ranks of *beekeeper* initially view others as perhaps their new family. Camaraderie is expected, but for those who choose a variant system/hive, a door is opened that leads the beekeeper initially into defense mode. This defense is a result of ostracization, ridicule, and simply bullying.

Instead of a welcoming hand or word of friendship, many are avoided as their choice of a hive is not the standard Langstroth hive, so clearly they must be on an opposing beekeeping team!

Beekeeping Is Not Entirely Langstroth's World

Variant hives have always existed, with the most common 21st-century styles/methods being:

- Warré hive
- Top-bar or Kenyan hive
- Horizontal or long-box hive
- Flow hive
- Mini urban beehive
- Slovenian hive
- Barrel hive

and others unmentioned.

Each hive system serves a specific need due to regional issues, or adaptation to a specific environment, local conditions, personal limitations, honey production, bee health, growth cycles, emotional, medical, diet, age, millennial status, ease or simplicity, and of course beauty. The beekeeping industry clearly caters to the Langstroth

hive setup, but others still exist. Those with variant hives seeking beekeeping answers may be bombarded with responses typical of the Langstroth method. Those loyal to this 19th-century adaptation in beekeeping (Langstroth) may display almost religious zeal in defending *their* hive and opposing others as "second rate" or "novelties." Another may say, "If you want to be a beekeeper, you need to do as the big boys do." The beekeeper's perceptional view window is stuck on one setting (hive), even though there's agreement that many types of hives exist. It is narrow minded to think one hive style can serve every need. Other needs exist besides honey.

When the Flow Hive made its initial debut on social media, many traditional beekeepers were vehemently opposed to it while new beekeepers were mesmerized by it. Some of the hatred rose due to the horrendous amount of "Hey, look at this new hive" posting. Many traditionalists tried to mansplain the reasons why it was bad, evil, foolish without ever trying it. Not everything needs to be tried to expose faults. Experience can replace some testing, but testing is the best route. Many reasons have been touted in opposition to this new hive system, but many have now successfully used it. Is it a perfect system? The answer is to be decided by the one using it. Years ago, we had rotary telephones, and we loved them—longer the cord, the better. Today we have minicomputer style cell phones, and we love them despite their costs and frequent repairs.

My Belief Is Better Than Your Belief

Bullying may come differently to people. It may be harassment, talking down, mocking, using descriptives such as: "You're stupid." "How could you ever think that would work?" and "I know better than you." Sadly, many who profess beekeeping knowledge base their insights on their understanding of the Langstroth method. It is similar to knowing how to ride a bike based on knowledge of driving a car. If you need information on how to ride a bike, information on the car may be completely unrelated. Sure, there are similarities, but the method in question may be entirely unique and related only to the Langstroth method.

A comment copied from social media, "I never get my panties in a bunch, but if you suggest something, and 20 experienced people immediately tell you it is a really bad idea, it is not a pile on, nor is it bullying.

"It is the voice of experience trying to keep you from making a mistake. If those same 20 folks spout off about a hive or frame system they have never used and in many cases never seen—that is not experience; that is contempt prior to investigation." He continues by naming a person responsible for a modern hive, who ". . . has a hiving system that is not what I am interested in but I can see the practicality for the uses he markets for. As a beginner I had three different hive systems: two systems came to me to test, and I built a horizontal double system. I am interested in the horizontal double for what it is worth.

"None of my hiving systems are perfect, nor are they substandard just because the old hands 'do not think' the system is of value."

Another derogatory remark, ". . . I have seen so much of this and wondered why beekeepers eat their own." Some attack, demean, and insult. It serves to discourage others from asking questions and sharing experiences in beekeeping. Rather it could be said, "I'm glad to see someone addressing the issue. Thank you."

A lady from Oregon wrote, "As far as support from other beekeepers, I haven't found anyone who would share their information; it's like a private club or something." And, "When I started, a few people told me that I would fail, as I did not start with a queen. One person, in particular, who has kept bees for 20 years, said raising your own queen was the most ridiculous thing ever and said that I bought into a stupid scheme."

Basing a belief on a myth is like believing in a fairytale. There are myths in beekeeping. Beliefs that are actually false, but are promoted and taught by many.

• A colony needs 80 pounds of honey to survive a winter.

Smaller colonies require less stores. Carniolan bees go through winter with smaller colonies and can survive with less. Italian bees build up to large colonies that consume a great deal of resources even in winter.

• You can't start a colony without a queen.

As long as there are nurse bees with open brood laid by a mated queen and available resources of pollen and honey, the colony can create a queen.

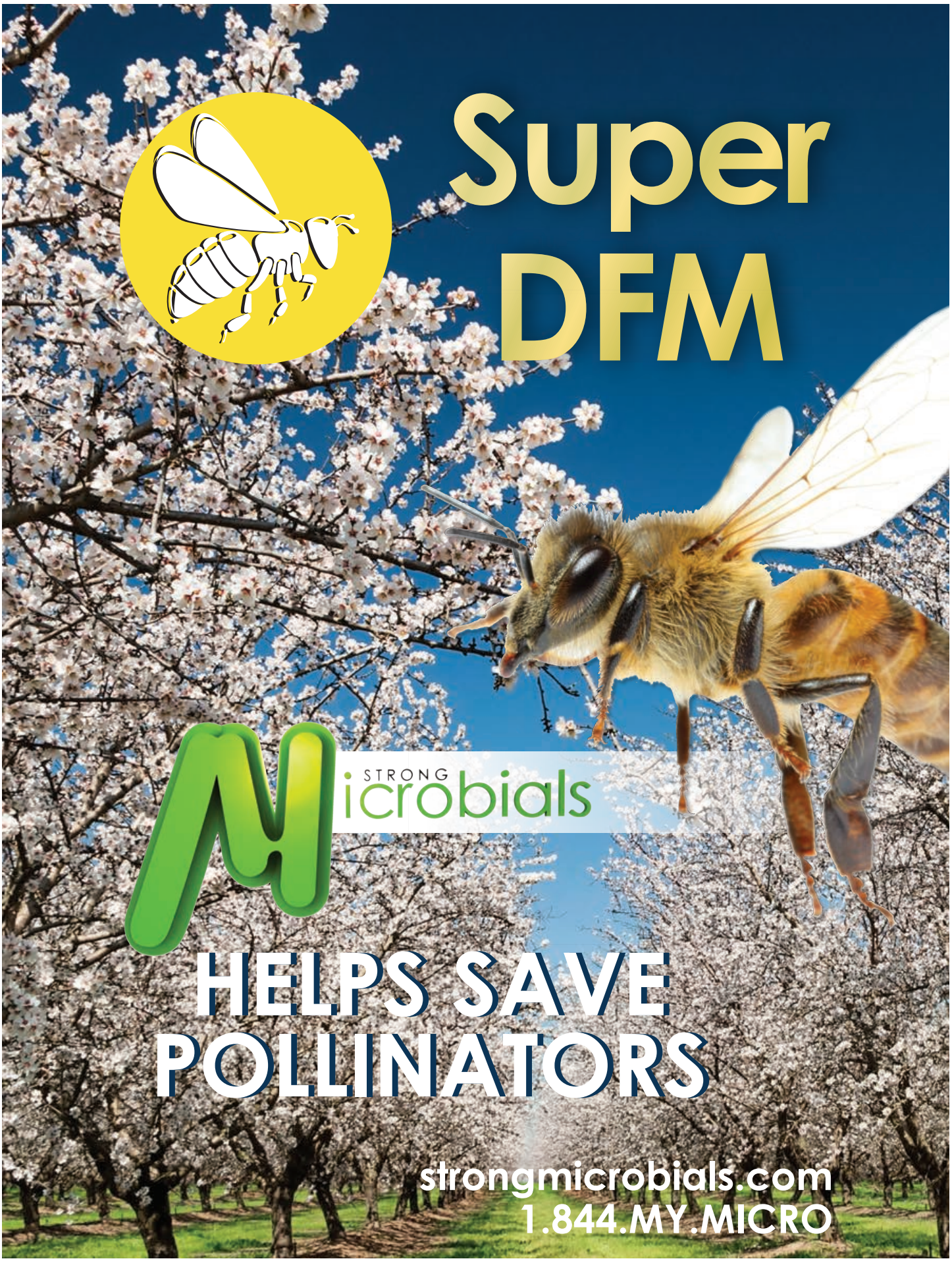
• All honey bees are aggressive.

Defense bees are protective; nurse bees are nonaggressive.

• Plastic foundation is the only way to have perfect frames.

Smaller frames with starter strips of thin surplus create perfect honeycomb.

• Only a double deep or equivalent hive can survive


Super
DFM
STRONG
icrobials
HELPS SAVE
POLLINATORS
strongmicrobials.com
1.844.MY.MICRO

the winter.

Small colonies have survived the winter in nature for 30 million years. Methods and hives exist that prove this false.

• A swarm in May is worth a load of hay, a swarm in June is worth a silver spoon, a swarm in July isn't worth a fly.

Swarms can always be added to an existing colony. Double queened colonies also generate faster larger bee populations. Mini colonies can be started as late as October and survive the winter.

• The size of the hive is equal to how much honey can be produced.

Honey production is related to available forage and health of the colony. A smaller colony/hive can outproduce a larger colony/hive based on location, health, and age of queen.

• Only a 3-pound package or a 5-frame nuc can build a colony that can survive the winter.

Colonies started with as little as two 6" x 6" frames of open brood with nurse bees by June can not only create a locally mated queen, but also survive winter in any North American climate.

• Bees prefer a vertical hive compared to a horizontal hive.

Many methods/hives exist globally, showing bees adapt to their chosen hive.

• Drawn wax takes lots of resources for a colony to produce.

Wax is produced quickly when nectar is abundant. Inducing wax production can be facilitated by feeding when nectar is slow.

• One hive style is perfect for every application.

Many needs exist for having honey bees ranging from medical apitherapy to apartment dwellers, to pollination gardens and seniors or children and those with handicaps. One size hive does not fit all needed applications.

• The best hive is the Langstroth hive.

There are many hives and each has pros and cons. The Langstroth hive is the best commercial hive as it is adapted to facilitate honey production and pollination. It is not, however, a great hive to learn on. It is heavy, requires extraction, can utilize plastic foundation, and can be overwhelming to a new beekeeper.

Provable Insights Are Wonderful To Share

The scientific study standard requires results to be verifiable through an independent source. If the results cannot be replicated, then the results are not valid. It is difficult to claim something is false without testing. Testing just once may not be adequate as the attempt may also be flawed or skewed by other factors, or may have a personal bias that is reflected in the attempt.

Everyone has an opinion, and perceptions vary. Many rally behind teams and fill stadiums for contests of skill and strategy. Sometimes underdogs prove victorious. In beekeeping, similar contests can be seen daily on social media exposing fanatical intolerance to the degree of tribalism. Supporters of each method protect their own and claim varying techniques and skills. Those caught up in these lively Internet beekeeping debates may see fervor similar to religious zeal urging on the modern-day crusades to flush out the opposing views. Which beekeeping method is the best? That entirely depends on the needs of those who are beekeeping. There are many reasons to possess and raise bees, and hive styles will equally vary.

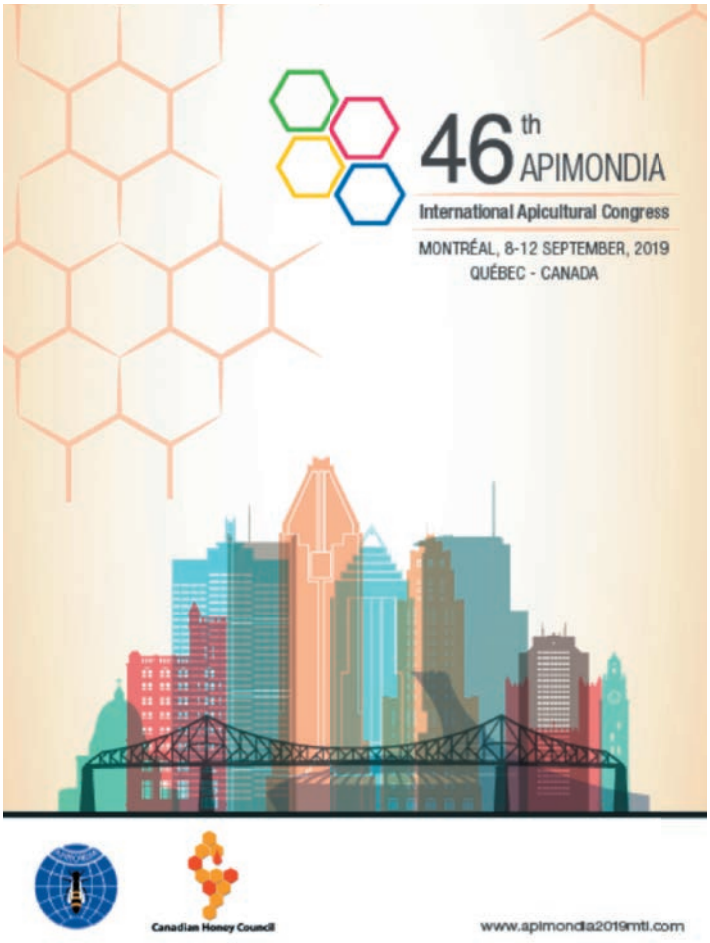
Kindness, an Art Decimated by Social Media

The true teacher understands a student may learn in many ways, one of which is in failure. Failure is a powerful teaching experience. It is also vital that the teacher first learns about the item in question.

Speaking generally about beekeeping is a general topic, whereas speaking about a specific method requires an understanding of that method. To teach requires kindness and tact, including the powerful saying, "If you don't have anything good to say, then say nothing at all."

According to Karanveer Pannu, the number one cause of bullying is ignorance (www.theodysseyonline.com/detrimental-consequence-ignorance-lack-education). Some suggested guidelines to prevent beekeeping bullying online or otherwise:

- Avoid speaking down to the person or using derogatory comments.
- If you do not have specific understanding related to the item discussed, say nothing at all.
- First, seek to understand the needs of the individual.
- Suggest where information can be obtained, if known.
- Refrain from mansplaining or trying to



redirect to a personal agenda.

- Understand many views can be right, but the missing key may be what "they" want, not you.
- Recognize that you may not know everything about beekeeping, even though you are a beekeeper; that is okay.
- Remember that helping may be just listening.
- Understand the question before you respond.
- Keep your personal feelings to yourself.
- Avoid manipulation, as it is the act of intentionally trying to redirect to your way of thinking.
- If related to the Internet, know many may see your comments besides those in the discussion.

A recent discussion on a Facebook site was initiated by a new beekeeper wanting access to bees. Instead of specific help solving his issue, discourses followed relating to the "poor" choice of beekeeping equipment. In the end, a personal response was sent via private message, "Looks like I am now hated by my new friends." As referenced earlier, do we "eat our own" or do we nurture them to succeed despite what we may think is good for them?

Saskatraz Breeding Stock Available in 2018

Queen cells from tested Saskatraz breeders ($20). Closed population mated breeder queens ($500). Outcrossed breeder queens ($200). Saskatraz stock carrying VSH trait also available as queen cells, in Saskatraz hybrids, and as breeder queens in 2018.

Saskatraz Hybrid production queens available April 15th to August 15th from Olivarez Honey Bees (USA). These hybrids will produce pure Canadian Saskatraz drones for stud use. Saskatchewan-produced queens available June to September 1. All breeding stock tested and certified. Limited number of nucs available in 2018 with Saskatraz hybrid queens. See: www.saskatraz.com for breeding information and updates.

Saskatraz stock bred in Saskatchewan for honey production, wintering ability, and resistance to mites and brood diseases.

For prices and availability:
e-mail a.j.robertson@sasktel.net or
phone 306.373.9140; 306.270. 6627 (cell)

Obituary: Michael Wayne Faircloth Sr.

1950–2018

Michael Faircloth served on the WAS Audit Committee last summer. He always had a story to share.

Michael Wayne Faircloth Sr. was born May 23, 1950, in San Antonio, Texas and died March 4, 2018, in Boise, Idaho. As a young boy, Michael grew up in Galveston, Texas, until his family moved to Las Vegas, Nevada, in 1961. In 1968 Michael graduated from Valley High School in Las Vegas and went on to attend the University of Nevada-Reno, and graduated from with a master's degree in Music and History. While attending college, Michael married Janet Emmons and in 1970 their son, Michael Wayne Faircloth II, was born.

Michael worked as a middle school choir teacher and also played in local bands, with the Reno Symphony, and sang with the Reno Opera Guild. He went on to work for the telephone company and later for the unemployment office. He became active in the International Association Personnel in Employment Security and served as chapter president. After many years in Reno he moved to the Bay Area where he worked for Gibbons and Company, then to Bay Area Rapid Transit.

He was a member of E Clampus Vitus (ECV), a fraternal organization dedicated to the study and preservation of the heritage of the American West. Michael served as Humbug (president) of the Chief Truckee Chapter and during his term erected a bronze plaque dedicated to Tamsen and Elizabeth Donner on Donner Summit. Also during this time he took up beekeeping and sold honey at local farmers markets.

In 1997 a dinner date led Michael to Nancy, and he moved to Idaho in 1999; he also gained stepdaughter Amber. Michael helped establish the Snake River Chapter ECV and served as their historian. He was active in the State Historical Society and served as a judge and mentor for the National History Day Idaho contest. He began singing with the University Singers and Immanuel Lutheran Church, and loved singing with the Immanuel Choir. Soon he and Nancy became regular members. They have been so supportive to him and Nancy through all the rough medical patches he has endured for several years.

Michael is survived by his mother, Helen Beller Faircloth, sister, Vickie (Larry) Bennett, brother, Stacy Faircloth, wife, Nancy Guerin Upchurch, son, Michael Faircloth II (Irma), and stepdaughter, Amber Upchurch Craft (Andrew), and grandchildren, Kevin Payne, Stephanie (Eddie) Martin, Christa Faircloth, Lillian Craft, Charlotte Craft, and great grandchildren, Alex Payne and baby Martin (due in September), along with numerous nieces and nephews. Donations can be sent to Immanuel Lutheran Church in Michael's name.

plastic bottles

32 oz Classic Plastic	168 Ct No Caps	$100.95
16 oz. Classic Plastic	321 Ct No Caps	$124.95
8 oz Classic Plastic	550 Ct No Caps	$151.62

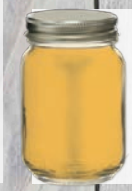
2 oz Panel Bears	800 Ct No Caps	$229.95
6 oz Panel Bears	660 Ct No Caps	$181.45
8 oz Panel Bears	525 Ct No Caps	$144.95
12 oz Panel Bears	400 Ct No Caps	$114.95
16 oz Panel Bears	240 Ct No Caps	$94.69
24 oz Panel Bears	195 Ct No Caps	$89.50

1 lb Inverted Deco
364 Ct No Caps $156.50

24 oz Inverted Deco
225 Ct No Caps $98.45

5 lb Deco
72 Ct No Caps
$78.35

new mini jars



Glass Mini Mason Jar
3 oz honey weight
36 ct case
includes caps
$17.95
Coming May/June 2018

Glass Mini Skep Jar
3 oz honey weight
24 ct case
includes caps
$11.95
Coming May/June 2018

We Also do Customizable Labels
Check out our website for details
www.blueskybeesupply.com

38mm Standard Caps

Red, BrightYellow, Golden Yellow, White, Black, Metallic Gold
100 caps / $11
1700 caps/$129

38mm Rainbow Caps

Purple, Lime, Dark Green, Baby Pink, Baby Blue, Dark Blue, Orange & Dark Brown
100 caps / $11
2000 caps/$172

New Glass Hex Embossed Cylinder

12 oz Glass Cylinder w/ Hex Embossing
12 ct Lids included
$9.95
Coming May/June 2018

Call for SPECIAL QUANTITY PRICING for the West Coast, Hawaii & Alaska

glass bottles

16 oz Glass Muth
12 Ct with corks $16.95
8 oz Glass Muth
12 Ct with corks $12.85
4 oz Glass Muth
36 Ct with corks $28.49

8 oz Jelly Jar
12 Ct No Lids
$4.81

12 oz Glass Skep Jar
12 Ct
includes lids
$10.45

9 fl oz Glass Hex		
12 Ct	lids included	$11.25
6 fl oz Glass Hex		
12 Ct	lids included	$10.50
3.75 fl oz Glass Hex		
12 Ct	lids included	$8.50
1.5 fl oz Glass Hex		
24 Ct	lids included	$11.50

Blue Sky® bee supply

930 N Freedom Street
Ravenna, Ohio 44266

www.blueskybeesupply.com
(877) 529-9233

Introductions

Hawaii Regional Director

Noelani Waters, Hilo, Hawaii

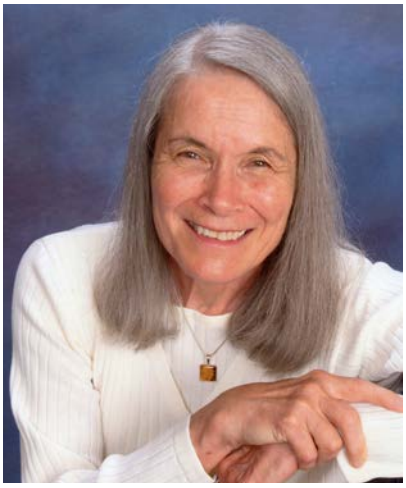
Noelani Waters is a beekeeper and educator in her home town of Hilo on the Big Island of Hawaii and has been keeping bees since 2011. She graduated from the University of Hawaii at Hilo with a degree in Tropical Plant Science and Agroecology and a Certificate in Beekeeping. Most recently, Noe worked for 3.5 years as an apiary specialist and inspector for the Hawaii Apiary Program, a statewide program with the Hawaii Department of Agriculture that focused on honey bee biosecurity, queen breeder inspections, education, outreach, and national honey bee surveys. This work brought her to all corners of the state to work and learn from beekeepers of all sizes and focus. As of March 2018, she has recently transitioned to join a VSH breeding lab on the Big Island led by Hawaii Island Honey Co and Arista Bee Research Institute.

Noe is a member of the Big Island Beekeeping Association and has had the sweet opportunity of being a judge for the Hawaiian Natural Honey Challenge for the last three years. She has had the extreme pleasure to work on women-led beekeeping teams and hopes to inspire more young women to pursue beekeeping and pollinator protection careers through continued community outreach and education in the Aloha state and beyond.

In her spare time, Noe is an avid gardener, potter, and hiker. She and her husband, Aaron, their dog, Mauka, two cats, and six chickens live on a tiny homestead outside of Hilo up the Hamakua Coast.

WAS Journal Editor

Rosanna Mattingly, Portland, Oregon



A native of Kentucky, Rosanna has enjoyed teaching university-level courses as well as high school science and math, editing research papers for technical journals, and providing editing, layout, and publishing services for clients writing both nonfiction and fiction. She continues this work through Meta Writing and Education Services LLC, located in Portland, Oregon. Her formal education in the biological/ecological sciences (University of Louisville, Michigan State University, and Oregon State University) and research on streams and rivers inform and add perspective to her years of keeping bees. Organisms in both a stream and a beehive effectively assimilate/integrate what takes place in the surrounding landscape; in essence, they reflect the profound interconnectedness of the all that occurs on this good earth. They have much to teach us of time, place, and life.

Author and publisher of *Honey-Maker: How the Honey Bee Worker Does What She Does*, Rosanna shares her love of bees through various other writings and by editing the newsletter and keeping the website of the Oregon State Beekeepers Association. She also participated as a member of the Oregon Master Beekeeper Program planning committee at the program's inception.

Rosanna is honored to serve as editor of the *WAS Journal* and very much welcomes input from WAS members and leadership.

Note: As we now know, Fran Bach has made good on her decision to retire, which she announced in the February 2018 issue of the *WAS Journal*. Although I intend to do right by the journal she has cared for since 2003, it is only with full understanding that there is no replacing Fran.

Membership Form

Western Apicultural Society of North America Inc

To join or renew online, visit: www.westernapiculturalsociety.com

New _____ Renewal _____

Name: _____

Mailing Address: _____
Street/Box Number

City: _____ State/Province: _____ Zip/Postal Code: _____

Phone: _____ e-mail: _____

Please Tell Us About Yourself

Beekeeper? ___yes ___no Number of years: ___ Type(s) of hive: _____

Age group: ___under 25 ___25–40 ___40–65 ___65 or over

Number of colonies: ___small scale (<25) ___sideliner (25–300) ___commercial (>300)

Other area(s) of work/interest? _____

Membership Level	Dues	Amount
Individual	$20 US	_____
Couple	$30 US	_____
Junior (<21 years)	$15 US	_____
Senior (≥65 years)	$15 US	_____
Senior Couple	$20 US	_____
Association	$20 US	_____
Commercial	$100 US	_____
10 Year		
Individual	$200 US	_____
Couple	$300 US	_____
Benefactor	$500 US	_____
Patron	$1,000 US	_____
Journal Preference	**Cost**	
Print	$20 US	_____
Digital	—	
Optional Donation		_____
TOTAL ENCLOSED		_____

Make check payable in US funds to Western Apicultural Society and mail with form to:

Western Apicultural Society

4207 SE Woodstock Blvd Ste 517

Portland OR 97206


WAS Up!
WAS Annual Conference
August 3–5, 2018
Event and Lodging Information:
www.westernapiculturalsociety.org
JACK'S URBAN MEETING PLACE
Boise, Idaho
FEATURING:
Jennifer Berry
Randy Oliver
Sarah Red-Laird
& many more!
APICULTURAL
WESTERN
SOCIETY
OF
W.A.S.
NORTH
AMERICA

Western Apicultural Society of North America Inc
4207 SE Woodstock Blvd Ste 517
Portland OR 97206

www.westernapiculturalsociety.org