AMERICAN BEEKEEPING FEDERATION

QUARTERLY

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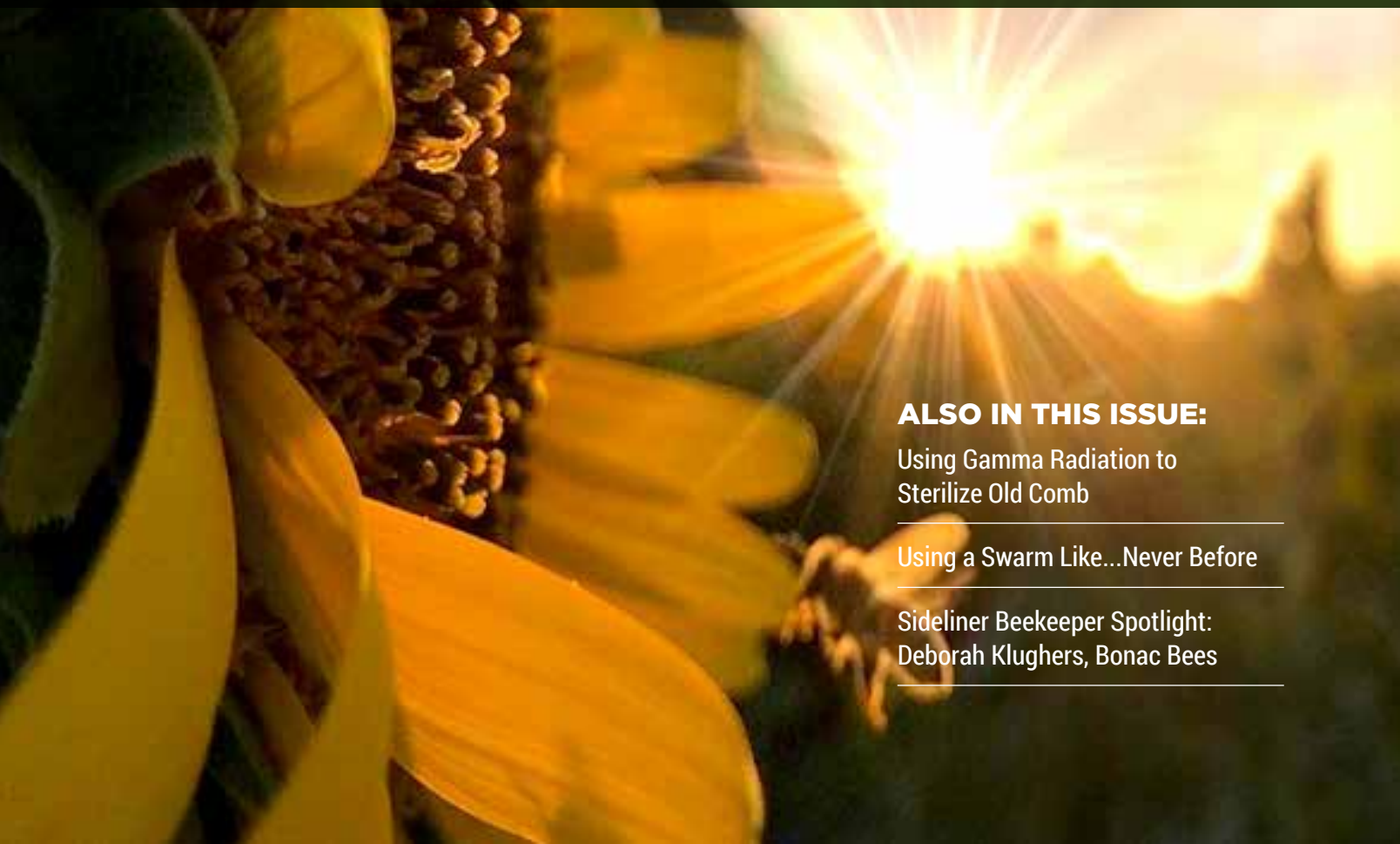
BEES DO NOT HAVE A STAY-AT-HOME ORDER



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(701) 537-5214
jmgunter@hotmail.com

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(1st Term – Expires January 2021)
Vice President
(239) 564-0255
beeman.dan@icloud.com

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(1st Term – Expires January 2021)
Past President
(815) 568-6010
tim@sunnyhillhoney.com

Molly Sausaman (non-voting)
Executive Director
(720) 616-4145
msausaman@abfnet.org

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(407) 330-8542
beeremovalexpert@gmail.com

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(402) 261-3407
wnelson193@neb.rr.com

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(214) 578-3327
blake@desertcreekhoney.com

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(406) 322-5780
psundberg@hotmail.com

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jaym@2jfarms.com

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leex1444@umn.edu

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(2nd Term – Expires January 2021)
(254) 983-2337
jwalker8811@gmail.com

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The Importance of Commercial Beekeeping

JOAN GUNTER, ABF PRESIDENT

Almond tree.

Hives ready to hit the road.

Queen bee.

Commercial beekeepers have received a lot of criticism in the past. However, the truth of the matter is that the industry depends on these operations for many reasons.

Pollination seems to be at the top of the list. Pollinating almonds in California spiked in the 1990s. It began as a nice supplementary income for honey producers and a solution for easier winters on the hives. Now, it has become an income source for commercial beekeepers, and the honey crop has become the supplementary income. This is a total turnaround from the old days.

The benefits to the almond growers are substantial. Without the use of commercial beekeepers, there would be no commercial almond industry. The self-pollinating varieties promise a change to that theory, but even they have proven to depend on honey bees. Beekeepers are important to everyone and everything.

Almonds aren't the only things that benefit from honey bee pollination. Apples, blueberries, oranges and watermelons are just a few of the many fruits and vegetables that require pollination. Commercial beekeeping services are offered to these orchards and farms as well. As a result, commercial beekeepers can be on the road for as much as six months of the year, providing these essential services.

Hobbyists and sideliners rely on commercial beekeepers for many things. They are a great resource that is unreplaceable by books or articles. Commercial beekeepers provide hands-on information and advice on topics that may help smaller businesses improve and grow into the type of business that is profitable and successful. They also provide bees and queens to help rebuild depleted colonies or to help grow into a larger operation.

Queens and cells are bought and sold to many beekeepers who are splitting their colonies to expand their businesses. Commercial beekeepers sell stock to the beekeeping supply companies. If you order bees from a catalog or website, the commercial beekeeper is usually the one supplying those businesses with their inventory. There are times when these companies have their own hives to meet supply and demand, but there is often an experienced commercial beekeeper behind the scenes.

Beekeeping classrooms conducted by commercial beekeepers are a great means to expand their knowledge to beginners or anyone who needs to refresh their skills. It is also a good way to expand their business by selling beehives and cells or queens to these ambitious students. Word travels fast through this industry. A good commercial beekeeper continues to have a business by encouraging beginners. They will return and pass the word on to others.

The best-known resource for commercial beekeepers would be the sweetest part of the hive. HONEY! The United States has wonderful honey. Many times, the honey that consumers buy is not true U.S. honey. It is vital that consumers are aware of where their honey is coming from. The ABF is committed to educating consumers on this exact issue. ABF is beginning a campaign to know your local beekeeper. This will bring us back to a true U.S. homegrown product. One that makes us proud.

Joan Gunter

DAN WINTER,
ABF VICE PRESIDENT

> “A LITTLE THUMP TO THE HIVE ENSURES APPROPRIATE SOCIAL DISTANCING”

BEEKEEPING IN THE COVID-19 ERA

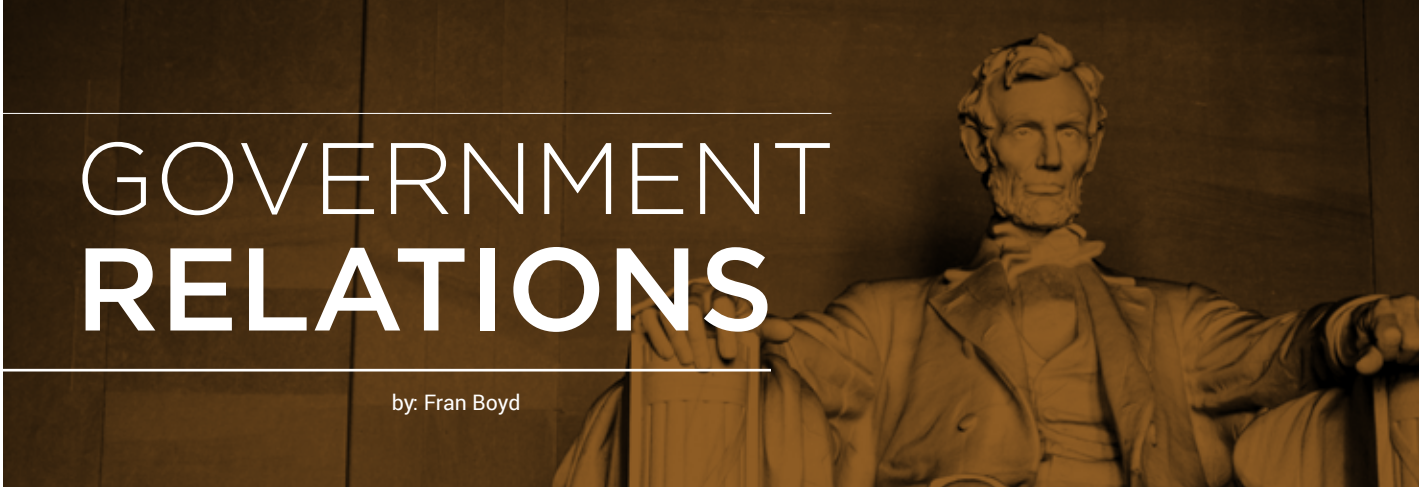
As a migratory beekeeper recently returning home, I hope my update finds members safe and healthy with their families as well.

The Coronavirus/COVID-19 epidemic has become very real for me as I return to New York. My wife Tamara is a 15-year veteran ER nurse, so precautions are a must in our daily lives. Masks and sanitizers have been added to the daily checklist of equipment next to the vail, smoker and hive tool.

As I struggle to feed hives for the upcoming days of cold, rainy weather, fortunately for us, it seems we're carrying on with “business as usual.” It's definitely easier in this profession than others to socially distance, and I will maintain those precautions as I work with nuc customers, farmers and landowners in the weeks ahead. I'm grateful for smartphones now more than ever.

I try to remain optimistic as we come into a busy spring. I'm looking forward to the honey season and hopeful that the economy will sustain us. My bees look good and are ready for warm weather.

I hope everyone has a safe and honey-filled summer. Reminder: A little thump to the hive ensures appropriate social distancing.



GOVERNMENT RELATIONS

by: Fran Boyd

Bees Do Not Have a Stay-At-Home Order

A large part of the country—Washington, D.C., and the surrounding area included—has been under a "stay-at-home order" since March for all business and services except those determined to be "essential" which includes agricultural food production and distribution. So for the last several months while most of us have been shut in our homes and attached to our computers (and a thing called Zoom), you and your fellow beekeepers—large and small—have been tending to your hives, hauling your bees and taking care of their health and welfare.

The Coronavirus/COVID-19 pandemic has taken and continues to take a historic toll on our nation's blood and treasure. As I write this column, unemployment is at almost the level of the Great Depression, and the virus has taken as many American lives as the Korean and Vietnam wars.

All economic segments including agriculture have been impacted by this virus with the shutting down of America's foodservice industry literally overnight. In March, Congress stepped up and came together and, by almost unanimous consent, passed the Coronavirus Aid Relief and Economic Security (CARES) Act. This estimated $1.8 trillion legislation was an attempt to bring relief to people and industries during this historic pandemic. The bill included grants and emergency loan programs that eventually were available for all agricultural producers to apply. Of course, Congress did not anticipate the huge need, and the funds in these programs were soon exhausted. Additional action was necessary to replenish funding.

Within the massive text of the CARES Act were provisions carved out to assist the serious needs of U.S. farmers and ranchers. Nightly on the news, we saw pictures of milk being dumped because there was no place to send it, fields of vegetables being disked under and massive depopulations of chickens and hogs. Over $19 billion was directed to address this problem including an additional $9.5 billion of emergency funding for agricultural producers in the CARES Act.

In April, Secretary of Agriculture Sonny Perdue announced the USDA's launch of the Coronavirus Food Assistance Program (CFAP) to provide direct aid to U.S. farmers and ranchers and to provide food to those in need through the purchase, distribution and delivery of food to food banks and community and faith-based organizations. The two programs were estimated to cost $16 billion in direct payments to farmers and ranchers and $3 billion in food purchases for distribution.

The food purchase programs are already up and underway, and in May, the administration published the final rule for the CFAP direct payment program with applications to be filed in each applicant's local Farm Services Agency (FSA) office beginning May 26, 2020.

Two principle USDA agencies will be used by the Secretary to implement CFAP—the FSA and the Agricultural Marketing Service (AMS). FSA will be the principle agency charged with implementing CFAP, and AMS will assist FSA for matters dealing with producers of specialty crops where consideration for honey would fall.

CFAP direct payments to agricultural producers will provide eligible producers with financial assistance that is aimed to help offset losses due to price and market declines that occurred between mid-January 2020 and mid-May 2020 resulting from the COVID-19 pandemic. The program has a payment limitation of $250,000 per person and legal entity. The limitation applies to the total amount of CFAP payments made with respect to all eligible commodities. Corporate entities (including limited liability companies and limited partnerships) may receive up to $750,000 based on the number of actively engaged shareholders not to exceed three.

The eligible specialty crops that USDA believes suffered losses during this time period are listed in the final rule. Honey is not listed; however, the rule does state that "additional crops may be deemed eligible at a later date." We will work with AMS to let them know that honey should be included in the list of specialty crops. Recently, Senator John Hoeven (R-ND), Chairman of the Senate Agriculture Appropriations Committee, was instrumental in securing the initial funding for agriculture in the CARES Act. When asked about the CFAP program, Hoeven said, "It's a good start, but we will need additional assistance for producers before the end of the fiscal year."

In mid-May, the Speaker of the House attempted to move a massive $3 trillion relief package through the House. The measure did succeed by a margin of nine votes with no Republicans voting in favor of the bill. The legislation did contain a specific agricultural relief section that provided additional assistance for farmers and ranchers. Senate leadership has said they do not plan on considering the House measure.

What's next? Every day we see states begin to reopen—each at different speeds and degrees based on the number of cases in each area. But as I write this, we are starting to slowly and cautiously leave our homes. Washington, D.C., is still officially closed, but Congress comes in for a few days to vote and then leaves. Committee hearings are virtual. It definitely is a new world we are walking back into.

I believe there will be another major piece of relief legislation either in late June or in July. The two major issues needing compromise in order for legislation to make it to the President's desk are funding for state and local governments to assist them with COVID-19 costs and some form of liability coverage for employers as employees come back into the workplace. This compromise will be reached, but it will not be easy. Many believe it will be the last major piece of legislation for quite a while. We in the agriculture community will do everything we can to assure agriculture's needs and the needs of America's beekeepers are included.

One thing was demonstrated to the country during this crisis—America's farmers and ranchers never missed a beat, working every day to provide the food that Americans needed while they were locked down. I will do my best to make sure they do not forget.

ASK HOOPIE

Q. ***What are the things that I can do to keep my colony from swarming?***

A. The swarming instinct is a biological imperative that ensures the survival of the species. As a colonial species, the form of reproduction is to produce another colony—swarming. And as a reproductive instinct, it would be calamitous to eliminate it altogether. The available window that is open for swarming occurs in spring or early summer. The swarm must find a cavity, build the necessary comb and store enough honey to make it through the next winter. If they don't start early enough, they can't make it. In nature, only about 20 percent of the swarms make it through the following winter. With that introduction to swarming, there are still things that a beekeeper can do to reduce the urge to swarm.

The first commandment is to provide enough room in the hive. This space is primarily in the brood nest. The reason for that is the bees that swarm are young bees that reside in or at the edges of the brood nest. Any crowding there stimulates swarming. I use three medium-depth (6⅝"), 10-frame boxes for my brood nest (and sometimes four). If you are using 8-frame or deep supers, you can adjust your equipment to that amount of space. The queen tends to move upwards, so it often is good to reverse the boxes occasionally to utilize the space more efficiently.

When nectar starts to come in, it is important to have supers on the hive. If one super is on the hive, a new super is needed if the bees occupy all but the two outside frames. When you see beeswax being deposited onto the sides of the top-bars (or either one of these things), it is time to add more room.

One trick that helps is to have some foundation for the bees to draw out into comb. The bees that produce wax are young bees that have just been nurse bees and are the main group of bees that tend to swarm. So, giving them a job to do helps to prevent swarming.

Have a young, marked and clipped queen. A young queen produces more queen pheromone than an older queen. It is this pheromone that is distributed throughout the colony and "tells" the workers the queen is present and keeps the colony in balance. If the level of pheromone, in individual bees, drops below 0.13 micrograms per bee, the bees will tend to swarm. The best way to ensure the pheromone level does not drop too low is to have a young queen. Two-queen colonies swarm less because they have more than enough pheromone from the two queens, but that is another story.

I included having the queen clipped and marked. A clipped queen cannot fly, therefore if the bees do end up swarming, the swarm will be on the ground in front of the hive. You can collect it from there and won't lose the bees even though the colony will be in turmoil from the experience.

The genetic stock of the bees can play a minor role in swarming. It is always best to breed from colonies that do not swarm. In my experience, the races of bees tend to swarm in this order: African > Caucasian > Italian > Carniolan.

Q. ***Are nucs really an answer to the Varroa problem?***

A. Indirectly, nucs are an answer in two ways. The first way they answer the Varroa problem is that they hedge your bet by having an additional colony that, because of its brood break at creation, may survive the winter better than your normal colony. Thus, you end up with at least one colony the next year, as a result.

The normal way of starting a nucleus colony is to take three or four frames of brood (with some eggs and young larvae) into a separate nuc box. These are usually 4- or 5-frame boxes with their own top and bottom. Some beekeepers put in a queen cell or a purchased, mated queen to start a nuc. But, I prefer to let the nuc raise their own queen as this gives the nuc a longer period of no pupae for the Varroa to breed on. It is this brood break that reduces the Varroa population to low levels and allows the nuc to survive the fall and winter. You will have to feed and manage the nuc to help get it through the winter. Thus, nucs allow a beekeeper to have a backup colony that has a low mite count overwinter in case the parent colony dies over the winter—a biological control of Varroa.

Q. ***When and how many supers should I add to my colony?***

A. Several years ago, at the USDA Baton Rouge lab, the apiculturists there added a varying number of supers to colonies. The result was that the more supers they added, the more honey the colony produced. However, there is a downside to that result. Do you want to extract more honey from seven or eight supers or 80 percent of that amount from two or three? The cost of the equipment and the labor to extract the additional honey enters the equation too.

I would need to know what your local honey plants are to correctly answer this question, as that helps determine when to add supers to your colony. I usually have one medium-depth super on my colony when the colony starts to grow in late spring. It is often a honey super that was on the colony during the winter. Then, as the clovers start to bloom in my area, I add another box. For me, here in Mid-Michigan, when sweet yellow clover blooms, the honey flow is on full, and supers will be needed.

As noted in the answer about swarming, when you see bits of white wax being deposited on the sides of the top-bars in the top super, it is time to add another super. Again, it is good to know your area's honey plants and the length of the honey flow. If you don't know, go to your local bee club meetings and ask experienced beekeepers. The reason you want to know how long the honey flow lasts is because you do not want to add a super that only ends up with a small amount of honey in it.

for for January,
February, March 2020

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For available sessions, visit:
www.abfnet.org/education

IN MEMORIAM

CHRISTI HEINTZ

We offer our deepest condolences to the family of Christi Heintz (Landenberger) who passed away unexpectedly on May 11, 2020, a day after being celebrated on Mother's Day.

Known to her family as "Honey," Christi cared deeply for honey bees. Christi founded Project Apis m. in 2006 to support honey bee research, and her enthusiasm, curiosity and passion to find answers were a gift to the beekeeping industry. She dedicated herself to teaching her children and grandchildren about nature, skiing, hiking, playing guitar, photography and singing. She was the idea person, organizer and communicator for her family—always finding fun ways to share time together. One of her fondest passions was bagging peaks, and Christi left this world while doing what she loved on Black Mountain.

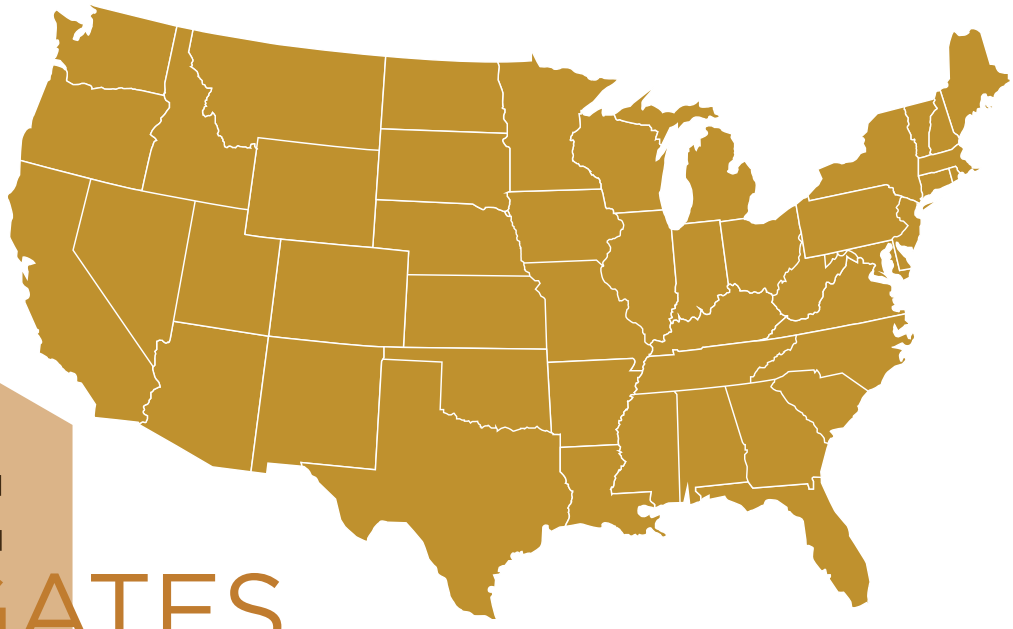
Christi's legacy will live on with her extended beekeeping family. If you feel compelled to donate in her honor, in lieu of flowers, please donate to Project Apis m.

ANN HARMAN

We honor the life of Ann Harman who passed away on May 1, 2020. Ann joined the ABF in 1979 and remained active in the organization for 41 consecutive years.

Ann was a legend in the beekeeping community both locally and internationally. She served as President of the Virginia State Beekeepers Association (VSBA) as well as Vice Chair of the Eastern Apicultural Society (EAS), Chair of the EAS Honey Show and judge for international, national, regional, state and local honey shows. Ann was one of the first to become an EAS Master Beekeeper. She was active as a teacher in the Virginia Beekeeping Teachers Consortium and volunteered to teach beekeeping skills in developing countries for 54 assignments in 29 countries, receiving four Presidential Awards.

Ann will be sorely missed by those she touched in life, but the spirit of beekeeping she bestowed upon this world will never fade.



STATE DELEGATES

Each state having ABF members may appoint a State Delegate to serve as a liaison between ABF and its state association and local clubs. Each State Delegate acts as a membership and legislative coordinator—communicating important membership and legislative information.

State Delegates meet bimonthly on March 10, May 12, July 7, September 8 and November 10, 2020.

We're Here to Help!

With meetings and events being postponed and cancelled this quarter, please remember the ABF is here to serve as a resource. If your state needs assistance scheduling virtual presentations for membership meetings, please contact the ABF headquarters office at 720-616-4145.

Let's Grow Together: Become a State Sponsor of the ABF!

Integral to the ABF's commitment to a strong American beekeeping industry is our unwavering support of state beekeeping associations across the country. Members rely on collaborative efforts between our organizations to help them face challenges and make sense of a fluid legislative and regulatory landscape.

For details: ***abfnet.org/statesponsorship***

What's in It for Your State?

We share a common goal of giving members insight and tools to succeed as beekeepers. Access to information, education and legislative and regulatory leadership are highly sought-after benefits of ABF membership, and your state can tap into these resources!

Sponsoring the ABF gives your state beekeeping association support in your continuous efforts to add value to membership in your organization without a hefty price tag. With input from our partnering state organizations, the ABF designed four state sponsorship packages tailored to address the diverse needs of beekeepers nationwide.

Other than a $100 minimum contribution, there is no set amount due to become a state sponsor. Select the sponsorship level that best suits your state association and contribute whatever amount the organization is able.

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Using Genomics to Predict Reproductive Quality: Which Genes Produce the Best Drones for Beekeepers?

FOUNDATION FOR THE PRESERVATION OF HONEY BEES, INC.

SCHOLARSHIP WINNER PAPER

by: Garett Slater, Purdue University

Previous Research Experience and Qualifications

I pursued honey bee research because I understood the current plight of beekeepers. Having personal connections with more than 30 commercial beekeepers and eight years of commercial beekeeping experience, I have become passionate about understanding sustainable solutions for the beekeeping industry. My master's research at North Dakota State University focused on queen failures, and after graduating and taking a position with The Bee Informed Partnership, I observed similar queen issues for the beekeepers with whom I worked. I was perplexed by this issue and decided to pursue my PhD at Purdue University, seeking to develop high-throughput genomic and imaging screens to understand drone fertility and integrate these techniques into commercial operations. Such techniques can greatly enhance breeding efforts, improve beekeeping stocks and boost honey bee health for the beekeeping industry.

Summary

Honey bees and their keepers face severe challenges in the U.S. Among the most highly reported of those challenges is queen failure. Queens can fail because they have mated with low-quality drones. If drones are not producing healthy sperm, their mates—queens—will not produce healthy colonies. Beekeepers can see the effects: Symptoms of poor drone sperm quality include spotty brood pattern, slow colony build-up and high supersedure rates.

The goal of my project is to identify genetic markers associated with drone reproductive traits. I will develop a rapid, high-throughput method for beekeepers and queen producers to incorporate genomics into their stock-selection decisions. I will assess the reproductive potential of those samples and fully sequence their genomes. This will allow beekeepers to not only identify mutations associated with reproductive success but also source queens which originate from higher-quality populations, source from unrelated populations to maximize apiary diversity and source stocks that may express traits of interest.

Background

One of the most pressing issues facing commercial beekeepers (and ultimately honey bees in the U.S.) is the poor quality of queens that are provided from suppliers. Colonies are often re-queened during the spring. This early re-queening is a new practice that has become a common management practice among beekeepers because of the high rates of queen failure. A shocking 30% of commercially purchased queens used for replacement fail within six months of establishment in a colony. Commercial beekeepers commonly purchase queens from multiple sources to hedge against future queen issues because future queen failures are hard to predict and quantify without killing the queen. Queen failure is among the top three reported causes of colony death.

Nationally, where beekeepers lost an average of 31.6% of their colonies over the 2017-2018 season, queen failure needs to be addressed to create a long-term, sustainable industry and healthy honey bee colonies. Historically, beekeepers and researchers have "blamed" queen failure on the queens themselves. However, male honey bees—drones—play a critical role in determining a queen's likelihood of surviving. Queens can fail because they have mated with males who produced low-quality sperm. Of drones which are sexually mature, as few as one in ten may be able to produce enough sperm to successfully inseminate a queen. If drones are not producing healthy sperm, their mates will not produce healthy colonies.

New, inexpensive, genomic tools can be used to predict if a queen is likely to produce drones with high- or low-quality sperm and if she should be used for drone production. What if breeders could examine the genetics of their stocks and identify colonies which produce the healthiest sperm? What if beekeepers could purchase queens from sources that have optimal genetics for their area?

Objective 1: Estimate reproductive quality of drones from queen-producing populations from Texas, Mississippi, California, Purdue and Canada.

We have a detailed understanding of the traits necessary for drone reproduction—sperm morphology, seminal fluid composition (proteins and nucleic acids) and endophallus morphology to name only a few. However, we have little understanding of precisely how variation in these traits is generated. This is an important question because variation in reproductive phenotypes can lead to variation in drone reproductive success and, ultimately, queen reproductive potential. Our aim

for objective 1 is to identify variation among drone reproductive traits from stocks across the country. These stocks were chosen because they have experienced different management, environmental and selection conditions.

Objective 2: Identify how genetics shape male traits important for the long-term success of a honey bee population.
Objective 1 will highlight how honey bee stocks sourced from across the U.S. and raised in a common environment vary for important reproductive traits. We expect these reproductive traits to vary, however we know very little about how this variation arises. This is a major gap in both our understanding of honey bee biology and in our ability to effectively manage colonies. This standing genetic variation may contribute to phenotypic variation in drone reproductive success observed among honey bee stocks in North America and contribute to the success (or failure) of colonies. Our aim for objective 2 is to identify genetic markers associated with drone reproductive traits. We can identify which stocks provide the most reproductive drones and use this information to improve stock selection for queen quality.

Objective 3: Develop a low-cost screening tool that beekeepers can use to determine reproductive capacity of colonies, colony ancestral origin and likelihood colonies will express traits of interest.
Researchers and beekeepers have largely ignored the role of drones, even though drones contribute to queen and colony failure. We will integrate these genetic tools into commercial operations to provide solutions for beekeepers. By sequencing honey bees from across the country, we can provide beekeepers with information on reproductive capacity and genetic ancestry of their stocks, make predictions about other traits they may express (e.g. hygienic behavior) and assess genetic diversity within stocks. The aim for objective 3 is to develop a low-cost screening tool for beekeepers. Through objectives 1 and 2, we can determine the genetics of drone reproductive traits. We will develop this information into a low-cost screening tool that beekeepers can use within their operation. This tool is called a SNP chip and can determine the ancestry of honey bee samples and the likelihood they will express the trait for less than a few dollars. These SNP chips have been previously used successfully by beekeepers in other countries.

Benefit for Beekeepers

The most innovative and impactful changes to beekeeping have been driven by cutting-edge research, and I want to be among the next generation of bee researchers to use innovative concepts and tools to improve the lives of beekeepers and their bees. These novel tools can be used to improve queen quality in the United States. Queen failure is a growing and concerning issue for beekeeping. As many as 50% of queens can fail within six months of founding. Queen failure reduces colony size, honey production and almond pollination checks. Researchers and beekeepers have largely ignored the role of drones, even though drones contribute to queen and colony failure. I believe these genetic techniques can greatly enhance breeding efforts, improve beekeeping stocks and boost honey bee health for the beekeeping industry.

Applying genomic tools to beekeeping opens up many additional opportunities for beekeepers. For example, with proper selection, honey bees can develop natural defenses towards Varroa, pathogens and diseases. Historically, this type of selection is difficult and time consuming for beekeepers. However, beekeepers can easily select for traits using genomic techniques. A 23andMe-like genetic test for honey bees can be used to improve stock and select for natural defenses against mites and diseases that impact honey bees. Also, a genotyping service can determine the reproductive capacity of colonies, colony ancestral origins and the likelihood of colonies expressing traits of interest. The work I have proposed here is the first step towards developing these 21st century tools for beekeepers and their bees.

U.S. HONEY PRODUCTION RESULTS

Released March 19, 2020, by the National Agricultural Statistics Service (NASS), Agricultural Statistics Board, United States Department of Agriculture (USDA).

UNITED STATES HONEY PRODUCTION UP TWO PERCENT IN 2019

United States honey production in 2019 totaled 157 million pounds, up 2 percent from 2018. There were 2.81 million colonies producing honey in 2019, down 1 percent from 2018. Yield per colony averaged 55.8 pounds, up 2 percent from the 54.5 pounds in 2018. Colonies which produced honey in more than one state were counted in each state where the honey was produced. Therefore, at the United States level yield per colony may be understated, but total production would not be impacted. Colonies were not included if honey was not harvested. Producer honey stocks were 41.0 million pounds on December 15, 2019, up 40 percent from a year earlier. Stocks held by producers exclude those held under the commodity loan program.

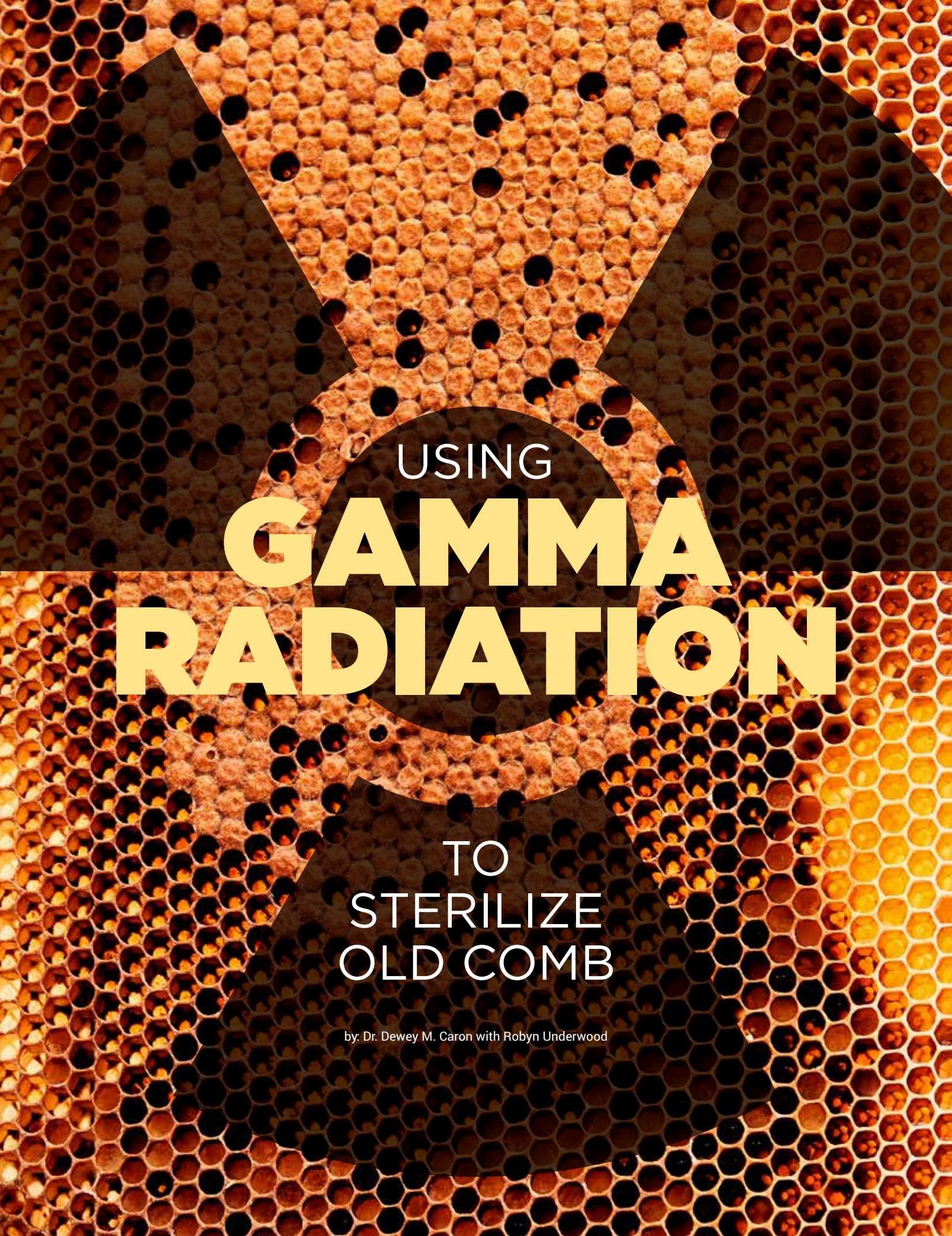
HONEY PRICES DOWN 11 PERCENT IN 2019

United States honey prices decreased 11 percent during 2019 to $1.97 per pound, compared to $2.21 per pound in 2018. United States and state level prices reflect the portions of honey sold through cooperatives, private and retail channels. Prices for each color class are derived by weighting the quantities sold for each marketing channel. Prices for the 2018 crop reflect honey sold in 2018 and 2019. Some 2018 crop honey was sold in 2019, which caused some revisions to the 2018 crop prices.

PRICE PAID PER QUEEN WAS $18 IN 2019

The average prices paid in 2019 for honey bee queens, packages and nucs were $18, $85 and $100 respectively. Pollination income for 2019 was $310 million, up 3 percent from 2018. Other income from honey bees in 2019 was $77.7 million, down 18 percent from 2018. These estimates along with expenditure and apiary worker information can be found on page four of the full report.

The full report is available at *www.abfnet.org*.



USING GAMMA RADIATION TO STERILIZE OLD COMB

by: Dr. Dewey M. Caron with Robyn Underwood

Beeswax comb is frequently considered the most valuable asset of a beehive. The reuse of old comb is cost-effective and a best-management practice. The secretion of wax and drawing of new comb require extensive wax gland secretion and energy expenditure by worker bees. A University of Georgia study found compelling evidence that new comb can improve overall colony health and performance.[1]

Several studies have demonstrated the spread of pathogens and parasites when old comb is maintained in colonies or reused to start new colonies. American foulbrood (AFB) is most often cited due to its spore-forming abilities, as is chalkbrood. A recently published USDA Baton Rouge study found viruses in old comb,[2] and a Penn State study offered evidence that viruses found in honey and bee bread stored in comb were potentially infectious.[3] The Bee Informed Partnership's (BIP) beekeeper survey results found that beekeepers who reused old comb lost more colonies compared to those who did not, although the survey does not identify comb features that may have influenced reduced survival.

Is there a feasible method to sterilize drawn comb (and pollen) to be fed to honey bees and bumble bees? It turns out the answer is "yes." The top performers are ozone, chlorine dioxide, ethylene oxide and gamma irradiation, but they all have some drawbacks.

Ozone works, but it does not get rid of viruses. It appears to be ineffective on chalkbrood spores and is very corrosive. Although chlorine dioxide is frequently used in sterilization of livestock facilities, appropriate parameters of how it might be used for beehives have not been determined.

Ethylene oxide (ETO) has a distinguished history of use following demonstration of its effectiveness back in the 1960-70s. Many states along the East Coast utilized special ETO fumigation chambers, while some beekeepers constructed their own fumigation chambers using plastic wrap. Unfortunately, ethylene oxide is quite toxic. The chemical is cancer-causing and needs to be used under pressure and heat (at which point it becomes a bomb). It is also expensive. Its use has been largely discontinued, mainly due to the potential cancer concern.

Gamma irradiation is used to inactivate pathogens that may infect various commodities such as food products (spices, packaged/imported foods), medical devices, pharmaceuticals and cosmetics. In 2018, USDA studies[4] demonstrated that higher levels of gamma irradiation can effectively inactivate chalkbrood, Nosema and deformed wing virus (DWV) and partially inactivate black queen cell virus (BQCV) and chronic bee paralysis virus (CBPV).

Some gamma drawbacks are 1) the level of irradiation that might be necessary; 2) it may not be cost-effective; 3) few available treatment facilities and 4) effects are not persistent. Initially, worker bees reared on irradiated combs in a lab study had lower levels of DWV, but its effects diminished through the summer. In the USDA Baton Rouge study,[5] comb irradiation was inconsistent, leading to conclusions that the effects of irradiation on viral levels may not translate to colony level productivity.

Mark Antunes, a sideliner beekeeper in Montgomery County, Pennsylvania, has been demonstrating the effectiveness of gamma radiation for sterilization of beeswax comb for the last 15 years. Gamma irradiation destroys, not just suppresses, the AFB bacterium at a relatively low-dosage level. An upcoming *American Bee Journal* article will describe Mark's experiences with gamma radiation.

During the irradiation process, cobalt 60 gamma rays pass through hive equipment, killing the AFB bacteria by breaking down DNA thus inhibiting cell reproduction. These high-energy photons induce changes at the molecular level, causing the death of contaminating organisms or rendering such organisms incapable of reproduction. The gamma irradiation does not leave any residual or impart radioactivity to hive equipment.

The sterilization program invites beekeepers that have dead-out equipment, those who purchase used equipment or those with American foulbrood to bring bee boxes, frames and comb with both honey and pollen to be treated. The process allows individuals to safely replace drawn comb into their operation without the risk of infecting new bees or spreading disease. The irradiation process is performed at the Sterigenics facility in Salem, New Jersey.

Mark has prepared an informative sheet along with a video on how to make everything from a single box to an entire pallet of bee equipment. Visit www.montcopabees.org/services-resources/irradiation. The cost of processing is $186.67 per pallet (2019 pricing) based on a full-capacity equipment run of seven or more pallets. A standard pallet is 40"x48" allowing stacks of seven deep or ten medium boxes high. One pallet can accommodate 42 deep at $4.45 per box and 60 mediums at $3.89 per box, all with frames and comb. To confirm effectiveness, a vial of live American foulbrood is packed into the load and irradiated along with the rest of the equipment for subsequent laboratory examination.

Mark can personally testify to the gamma radiation's effectiveness. He says, "One year I had several colonies that had severe AFB infections riddled with dead larvae. They had the distinctive AFB odor (which does not go away due to irradiation). I used the irradiated boxes, which had lots of honey directly from being irradiated and put them on top of single-deep overwintered colonies. Those colonies flourished that year with never a hint of AFB or other diseases." In a second instance, he says, "All of the other pathogens that impact my honey bees have pushed me to the conclusion that if the irradiation does not harm—I know it does good—then I am going to be safe, not sorry."

It is important to detect AFB or other disease conditions as early as possible. Starting with becoming familiar with bee diseases and examination of brood for AFB field symptoms. Since beekeepers do not see AFB with any frequency, a preliminary field diagnosis should be confirmed via use of test kits or confirmation by apiary inspectors where available. If you suspect AFB, consult with a more experienced individual. All state laws must be followed.

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USING A SWARM LIKE...

NEVER BEFORE

by: Albert Chubak, Eco Bee Box

Yearly, "swarm chasers" track rogue colonies like "storm chasers" do tornados and "pawnbrokers" the rare find. What is a swarm's worth? This is a tough question.

Swarms can vary typically from two pounds to 15 pounds and come as an intact family ready for growth. In 2019, 3-pound breeder packages of bees tipped the cash register at $200 to $250 a package! Hurricanes, floods, cities burned to ashes all took their toll on honey bee availability from bee breeders in the impact zones. Wind, water and fire when related to honey bees sounds like some kind of disaster clean-up slogan or tagline.

Something must change or else sales for equipment will drop, new beekeepers will prematurely retire and the hobby of beekeeping will again become an elitist endeavor. So "swarm chasers" may have a lucrative spring mission yearly to capturing swarms for sale. The price, though, is not based entirely on weight and size but also queen, location and type of honey bee.

In 2018-19 swarms sold for $100 to $150 in Salt Lake City, Utah. Values for swarms may command higher prices than a package, but one must ask the question, "Will the swarm stay?" Yes, risks always show their horrid gruesome face. The risk of a colony disappearing and leaving the beekeeper bee-less is always to be considered.

Thinking differently is key. How do you achieve growth with lower costs? Yes, thinking outside the box again is required or replacing the winter dead-outs (colonies that failed during winter months) will tap further into fall honey profits or your mission of love.

What Is a Swarm?

For this article, the swarm will be a colony with a mated queen. Variations can exist due to issues in every neighborhood from absconding, failed cut-out or trap-out, a colony sprayed with pesticide, a hive demolished in a construction site or by an animal and the list goes on. Many reasons exist for why that swarm ball might be sitting on the ground or on a tree.

The Historical Saying, "A Swarm in May..."

"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." This is clearly a 19th century saying. A load of hay today can be worth $5,000 plus mileage according to the hay forum haytalk.com. Is it possible to sell a swarm in May for today's load of hay?

Clearly, hay has increased in value, or has production and harvesting of hay changed? Why on Earth has beekeeping not done similarly? A few words from the soapbox, "Managing bees has remained relatively unchanged in 120 years except for adding the challenges of Varroa mite management, small-hive beetle infestations and Africanized honey bee threats."

Production of honey from the frame to the bucket has changed and improved, but the management

of bees is pretty much the same. If you read books from the 19th century, many of the challenges are still issues today, like wax moth, overwintering, feeding both sugar water (carbohydrates) and pollen (protein), better queens and much more. Reading books back to the 17th century still provides ideas on how to improve and show problems that have remained constant. Only the music and dancers have changed.

If we put current numbers to paper and one load of hay is worth $5,000 while a package of bees is $200 each, it would take 25 packages to equal the value of a load of hay.

Overwintering and a Small Cluster

An example: Overwintering bees has been a challenge since, well, perhaps since mankind has been managing bees. Oddly, honey bees have successfully overwintered for many millennia on their own. In the book written by the first female beekeeping author in the U.S., Lizzie E. Cotton described a common failure of large-framed hives in 1883.

> "In the winter, bees cluster as closely together as circumstances admit, and the severity of the cold demands. The more severe the cold, the closer they cluster together, in order the better to keep up the animal heat necessary to maintain life."
>
> "By all the old methods, the cluster of bees is divided by the sheets of comb, which is a great hindrance to successful wintering. In such cases the bees cannot cluster compactly together, but are spread out between the different sheets of comb." (Pg. 114-115. Bee Keeping for Profit, Second Edition. Lizzie E. Cotton, 1883.)

In any large-framed hive system, dissecting the cluster during the cold winter months is common. Inspection of the frames in spring may show repeated frames with honey stored on the top and sides with a large oval of bees headfirst into the cells dead. The prognosis is the bees starved. Oddly, they only had to move left, right or up and food would have been available less than a half-inch away.

On one side of the frame, the bees clustered and ate, absorbing the heat from the cluster on the opposing side of the large frame. Each frame had a successive pattern of starvation failure with nearby honey stores. A thought for the modern beekeeper to consider: In the last inspection of the hive for the year, drill a ¾-inch hole in the center of each frame. This helps the bees rejoin their cluster during the cold of winter.

Back to How to Make a Swarm Worth a Load of Hay

Some benefits of a swarm:

- Successful colony with mated queen.
- Prepared to make wax.
- Resources brought for initial needs.
- Equipped with foragers, cooks, disaster clean-up crews, dock workers, engineers, handmaids, inventory management, waitresses and air force and ground assault teams with Green Beret training mixed with Houdini skills.
- They come with a well-defined mission.

Is There a Better Way to Harness the Abilities and Innate Skills of "The Swarm?"

A test showing the growth of a 3-pound package versus an average swarm is revealing. The 3-pound package placed into a new medium Langstroth box with 30 undrawn mini frames will take 30 days or more to draw out the frames with wax and fill them with brood and resources. Compared to an identical hive, the swarm will draw it out and fill it with brood and resources in seven days! Is there a way to harness the exuberance of the swarm to generate 25 packages or the value of a load of hay?

Eliza Jane Donavan Article from 1870

Eliza Jane Donavan, a second-year beekeeper in 1870 in her early twenties with small children, had 150 colonies. Neither a letter written by Mrs. Donavan nor history detail how many "stands of bees" (hives) she and her husband had when they began, but her letter does in fact say, "We have 150 colonies." Whether they made the hives to house the bees or purchased them, they had adequate numbers of hives for their colonies to grow. Can colonies be increased with smaller starts than a 5-frame nuc?

Distinguished as the second book on beekeeping printed in the U.S., the anonymous book accredited to Christian Schulze, titled *A Short History of Bees* (dated 1803 in Philadelphia) shares a novel method of starting colonies on pages xi and xii.

> "M. Schirach gives directions for [populating] a hive, by cutting off a **piece of brood comb** in which were [larvae] that had been lately hatched: In one experiment he put only **two spoonsful of bees** into a **small box four inches square**, with a piece of brood-comb of the size of a crown-piece [38mm or 1¼"]; **containing [larvae] of three days**. That is the **period most proper for producing a queen bee**."
>
> "**These experiments were done in the early months of spring, and in any succeeding month; even as late as NOVEMBER [capitals added]**: He fixed a piece of brood-comb (containing worms which had been hatched three days) together with a portion of honey-comb – or in other words, with a sufficiency of food..."
>
> "He then put in, and **confined within the same box, a sufficient number of common working bees, taken from the same, or any other hive**. After much confusion and consultation, they betake themselves to work: **First proceeding to the construction of a [queen cell]; and then taking the proper measures to [emerge] and feed the brood** contained in it."

Schirach Method, Steps...

Note: "These experiments were done in the early months of spring…even so late as November."

- Acquire a "piece of brood comb."
- "Add two spoonsful of bees."
- Place/hang them in a "small box four inches square."
- Larvae need to be "three days," claiming this "period most proper for producing a queen bee."
- Add a "sufficient number of common working bees, taken from the same or any other hive."

An error or difference in terminology from 213 years ago is where it reads "containing [larvae] of three days." This should be corrected to be "after three days the eggs hatch into larvae, within 24 hours of being a larva" is the ideal time-period for "producing a queen." If there are "larvae three days old," there are, most probably, fresh eggs as well.

If M. Schirach's claim is accurate, queens and/or colonies can be started any time from spring to late fall! This challenges the saying noted earlier, "a swarm in May." If honey is the only desired goal, then perhaps the saying is almost accurate, but still, multiple-queen systems open the door for increased populations, which equals faster production of all harvested hive products. A 4-box mini hive, for example, 8"x10"x 6" equipped with three separation boards similarly mimics

Schirach's four-inch box. With the separation boards, each layer has its own entrance and is essentially four individual mating nucs with private entrances.

THE METHOD, OPTION 1:

Note: This 4-box mini hive took four times less time to fill and populate. Use the mated queens in other hives, sell them or option two.

- Start each box with a palm-sized portion of drawn comb with eggs to the beginnings of larvae.
- Place enough nurse bees to cover the portion of comb, times two. So, there will be more bees than needed for royal jelly production, wax creation, feeding and so on.
- Add a 2" piece of protein supplement.
- Supply a feeder with sugar water supplemented with vitamins or honey familiar to yourself.
- Block the entrances for three to five days.
- Each day, carefully inspect for a queen cell—the only cell with an opening facing downward.
- After the queen cell(s) are capped, open the entrance.
- Allow the bees time to build and populate their box.
- Once all four mini boxes are filled, remove three queens and join the four boxes together.

OPTION 2:

Note: This is a multiple-queen system producing exponential growth.

- Once all four mini hive boxes are full, separate the four boxes, adding an empty box beneath along with a new top and bottom.
- Let each colony grow to populate three to four mini boxes—continually adding boxes beneath rather than on top, encouraging brood production.
- Once the three to four boxes are filled, remove from the four separate colonies one box's worth of frames (six frames) equaling 24 brood frames.
- Place each of the 24 brood frames into separate boxes noted in the first option or add them to a 30-frame comb box (modified medium equipped with 30 mini frames).
- Let the comb box produce their own queen and grow.
- Within 10 days, the comb box will have bees emerging from 24 frames, each producing up to 1,500 bees.
- Seven days later, the comb box is full and needing expansion.
- Return to the original four mini hives to add 24 more frames as wanted until the colony is the desired size.
- Once the first comb box is filled, begin another and so on.

The "swarm in July" can equally produce productive queens as can the "swarm in May." The speed needed to build up colonies is based on the multiple-queen system noted above. Can a 30-frame comb box started in July catch up to the growth of a colony begun in May? A number of variables depend on whether the colony in May started as a swarm or a 3-pound package. A 3-pound package added to a 30-frame comb box takes 30 days to draw and fill. An average-size swarm takes seven days to draw and fill. If the start to Option 1 noted above is a package, then growth will be much slower.

In today's context, the age-old "swarm in May" saying can be changed to: "A 3-pound package in May is worth $200. A 3-pound package in June is worth much less. A 3-pound package in July is a very bad idea." The swarm growth compared to the package growth is initially 21 days longer. Understand historically, when the saying was penned, packages were not the way to start colonies—a swarm was.

Changing the cycles from a piece of drawn comb with two spoonsful of bees to a 3-pound package of bees in Option 1 allows the separation boards to be added in seven days compared to 21 to 42 days (worker bees take 21 days from laid egg to emerging bee). Using the 3-pound package then saves 14 to 35 days initially.

Case Notes: Miles began two separate true medium ½-box hives in May 2019. After a week, he added an expansion box under both colonies. Thirty days after he initially began, he added a second expansion box on top separated with a queen excluder. Forty-five days after he began, he removed 12 frames of open brood with nurse bees from each box (totaling 24 frames) and placed them into a standard Langstroth medium equipped to hold 30 frames. The space left from removing the 24 frames in the two original colonies was filled in seven days with expansion beyond the queen excluder underway. Seven days after the removal of the 24 frames, another 24 frames were removed to start another separate 30-frame comb box—again rearing their own queen. This continued until Miles had seven colonies (five where he raised his own queens). Due to rearing new queens, each colony had a brood break reducing the mite loads and threats.

Miles didn't obtain a swarm. Instead, he purchased two 3-pound packages. He wasn't able to produce 25 packages, so he fell short of reaching the $5,000 price of hay. He did produce additional colonies equaling a greater potential of honey production and has moved some hives to yards of family members. Seven robust colonies equal to a double Langstroth deep sell for $250 to $350 each, making his seasonal growth worth about $2,000 (not to mention honey). He is a first-year beekeeper. His colonies have no Small Hive Beetle or Africanized bees nor destructive Varroa mite loads due to brood breaks. If he was to be a part of a team going to California for pollination, then another $250 minus costs could appear. Adding another aspect to this equation, his frames are all mini frames. Each mini frame capped with honey is 1¼ pounds and sells for $20 to $25 each in Utah. A Langstroth medium 30-frame comb box filled with comb honey would be worth $600 to $750. The average hive in the Salt Lake valley produces approximately 30 pounds of honey. Miles's first season was devoted to building healthy colonies rather than honey production. He still produced 60 pounds of honey and five additional colonies with low mite loads.

Case Notes: Haylee acquired a swarm in late June in the Salt Lake valley. She added it to a 4-box mini hive. A week later, she found the entire hive full of bees bearding on the front landing. She liquidated some frames and bearding bees in exchange for three separation boards. Each isolated mini box created a queen that successfully mated and returned. She again liquidated two boxes' worth of bees, queens and brood in exchange for a second 4-box mini hive. Haylee now had two growing colonies in two hives, both experiencing a brood break, so mite counts were minimal. The bees she exchanged were in turn sold for $25 per frame and $35 per queen, equaling $365. The $365 plus the exchanged brood frames and bees she traded for separation boards were sold for $150, grossing $515. Her only out-of-pocket expense was the initial mini hive. She has since harvested several frames of honey and has enjoyed the experiences. Clearly, the profits were greater than a "silver spoon," and those who acquired her excess in July also continued to reap the rewards and lessons.

Methods in Beekeeping

There is a saying related to stupidity: "If you do as you have always done, expecting a different result…this is stupid." Doing something again and again with the hope of a change occurring is not smart nor scientific. Replicating an outcome repeatedly is key. Many beekeepers replicate mite failure season after season. This isn't the key we need to replicate unless the goal is to buy bees every spring. How can we be sustainable, increase and make profits? Catching up to the values of hay with advanced technology, coupled with methods, is the goal of this article.

Sideliner Beekeeper PROFILE

DEBORAH KLUGHERS
Certified Master Beekeeper

Eastern Long Island, New York
(about 100 miles east of Manhattan)

WHEN AND WHY DID YOU GET INTO THE BEEKEEPING BUSINESS?

I started keeping bees over ten years ago, purely by accident after completing my degree in Environmental Studies from Stony Brook University. I was alarmed by the many problems facing the planet and the fact that most people were unaware of the issues, so I created and produced "Keepin' It Green," a public-access television show intended to educate, inform and empower everyone about our environment.

One day, a farmer named Hal invited me to help make sauerkraut and spin honey with him. Knowing nothing about either, I quickly agreed and asked if I could interview him and film the process. Hal agreed and told me how he started keeping bees at his farm about a year prior. When I asked if he noticed a change in crop yield, he said it increased by a third! Hal could not attribute this increase to anything except the introduction of honey bees. I was intrigued, to say the least.

I realized that honey bees were something I needed to know more about. An avid gardener for many years, I wanted to increase my plants' productivity as Hal did, so I decided to try out this thing called beekeeping. What a trip it has been! What started as an unexpected desire to learn about honey bees and beekeeping has turned into a full-time fascination and thriving beekeeping business. And still, I need to learn more about those cute little honey bees who play a huge role in this thing we call life.

DESCRIBE WHAT YOUR BUSINESS CURRENTLY DOES IN THE INDUSTRY.

The bulk of my business involves managing honey bees for other people. I set up and maintain honey bee colonies on private properties, farms and businesses. I manage more than 50 honey bee colonies for others and also care for about 50 of my own. I perform cut-outs (removing and relocating unwanted honey bee colonies from structures) and set out bait traps each year to catch and rehome honey bee swarms. I educate both the public and policymakers about the importance of saving honey bee swarms and unwanted colonies from extermination in New York. This is a huge problem where I live, so I initiated legislation to stop the extermination of honey bees in New York, which was recently introduced into the state Senate and Assembly.

I offer consulting services to beekeepers who have questions or concerns about their colonies and also teach apiculture and apitherapy to beekeepers and non-beekeepers, including children, adults and various groups. I am also the editor of the *Journal of the American Apitherapy Society*, and as such, I strive to harvest apitherapy-grade hive products from my colonies for use in value-added products that promote health and healing. My products are well liked and, fortunately, sell out every year.

WHAT ARE THE FUTURE GOALS OF YOUR BUSINESS?

There is room for growth within my current business model and personal capabilities. In order to help keep honey bees alive, I would like to increase the number of cut-outs I perform each year. Far too many colonies are exterminated rather than saved here in New York, and saving honey bees one colony at a time is very fulfilling. Each cut-out or swarm removal also offers a very good opportunity to educate others about swarms and honey bees in general (and I take full advantage of talking about bees to anyone who will listen).

I am a Certified Master Beekeeper through Eastern Apicultural Society. A master beekeeper's role is to educate others about honey bees and beekeeping. I would like to increase the number of speaking and teaching engagements I offer. I'd like to become more involved with apitherapy and share the many benefits of honey bee hive products with others as well.

During Apimondia 2019, I presented the results of my independent research, "What Do Honey Bees Eat? A Quantitative Melissopalynological Study to Determine Honey Bee Foraging Preferences and Influence Local Landscape Decisions." The abstract

can be found in Apimondia's 2019 journal. Future research projects are in the works.

While at Apimondia, I entered my invention, the "Top Bar Hive Multi-Feeder-Treater," into the World Beekeeping Awards and took third place! I also entered it into the Eastern Apicultural Society's annual honey show and won first place! I am currently working on a few other inventions. Stay tuned!

WHAT ARE YOUR MAJOR CONCERNS ABOUT THE BEEKEEPING INDUSTRY AND HOW THEY WILL AFFECT YOUR BUSINESS?

My main concern is whether Varroa destructor will win the war against honey bees and their keepers. I treat my bees multiple times a year, but many beekeepers do not treat at all. My treated colonies rob out mite-infested, collapsing colonies and become re-infested. I'm not sure how long myself or others can withstand the financial pressure of constantly replacing honey bees. Whether through new packages, splits, swarms or other methods, the loss of a colony is a loss of a colony, no matter how we replace it.

I also think we should do something (and do it quickly) regarding the influx of foreign honey into U.S. markets. Not only is the imported honey lower in quality than American honey, but the large supply drives down the price of American honey. Yes, I know it's a free market and we have capitalism and all that, but if we don't do something to help American beekeepers stay in business, we will lose more than easy access to cheap honey. My business is affected by this glut of foreign honey because consumers don't understand (or maybe they don't care) why my honey costs more than commercially imported honey.

And then there are the pesticides and lack of forage available for honey bees. Last year, I lost 4% of my colonies due to "accidental exposure" to pesticides. How many more were weakened because of pesticide exposure, I do not know.

Keep in mind that farmers are not the only ones to blame when honey bees are exposed to pesticides. Far too many Americans strive to have the perfect lawn, even though what they strive for creates a toxic dead-zone. Where I live, people apply pesticides like water. They contract for weekly "applications" of pesticides, whether needed or not. We must change farming practices from pesticide-dependent, monoculture crops grown in depleted (if not dead) soil to a diversified crop system grown in regenerated soil with organic farming practices. We need to put more into the Earth than we take out.

WHAT IS THE MOST PRODUCTIVE CROP OR FLOWER YOU'VE SEEN YOUR BEES WORK?

The data from the research project mentioned above told me that the honey bees in my apiaries, which span about 1,500 square miles, prefer privet! Yes, privet. Every honey sample from every colony in the study contained between 8% and 87% of privet pollen. The takeaway message: Don't shear the privet until the flowers are done blooming. Simple.

WHAT IS YOUR FAVORITE TYPE OF HONEY?

I absolutely love honey in burr comb, directly out of the hive. It's warm and sweet and fun to eat (hey, sounds like a poem)! I do prefer dark honey over light and creamed over liquid. I must confess—I have a huge honey collection. There are more than 100 jars in my stash, and I'm always looking to add more. It's a sweet addiction.

WHAT IS THE BEST BEEKEEPING ADVICE YOU'VE EVER RECEIVED?

Feed the bees.

WHAT IS YOUR FAVORITE BEEKEEPING TASK?

Saving swarms and removing cut-outs from structures is my most fulfilling beekeeping task, for sure. Saving homeless or unwanted honey bees also provides a good opportunity to educate others about honey bees, swarms and their importance. I also enjoy checking on a new queen and finding her and her brood as well as helping other beekeepers see eggs, larvae or the queen for the first time. Witnessing the moment someone first spots a queen or identifies different stages of brood is priceless.

WHAT BEEKEEPING TOOL OR PIECE OF EQUIPMENT DO YOU ENJOY WORKING WITH THE MOST?

Well, if I am doing my favorite task described above, then it would have to be either my bee-vac or endoscopic camera that I use for

cut-outs. Otherwise, my favorite piece of equipment is my Lega uncapping machine. It's awesome and has made my extraction process so much easier.

WHAT DO YOU THINK THE BEEKEEPING INDUSTRY WILL LOOK LIKE IN THE FUTURE?

At the rate we are going, I see a grim future for honey bees and their keepers and a very boring food supply for Americans. Keep in mind that we had around six million honey bee colonies in America in the 1950s. Today, there are well under three million. Meanwhile, the global honey bee colony count is increasing, with close to 90 million colonies worldwide. I think we have an America problem, as our honey bee decline has spanned over 70 years! Just over 30 years ago, the Varroa mite invaded American honey bee colonies and have killed many, many honey bees. Unless we figure out the Varroa problem in addition to why America's bees have been in decline for so long, there may not be a viable beekeeping industry for future generations.

And then we have all the pesticides used in agriculture and the public and private sectors. There is a better way to grow food and have a beautiful landscape than by using toxic chemicals. That said, beekeepers are brilliant, industrious and resilient (kind of like honey bees, right?) and have been able, for the most part, to replace dead colonies to keep their business and bees alive.

WHAT IS THE MOST IMPORTANT PIECE OF ADVICE YOU CAN GIVE TO A YOUNG AND FUTURE BEEKEEPER?

I often hear new beekeepers say they want to be "natural" beekeepers and "just put the bees in a box and let them do their thing." I explain how unnatural beekeeping has become—grafting queens, package production and shipment of these newly formed bee "families," plastic hive equipment, mandatory feeding, nutritional supplements, medications, pest and pathogen management, broad-scale application of synthetic pesticides and more.

There is so much to know about keeping bees—the pests and diseases that affect them and how the environment in which the bees live can mean the difference between life and death as well as the cost and time necessary to be a successful beekeeper. I suggest new beekeepers take at least a year to learn as much as they can about honey bees and beekeeping before they become keepers of bees. There are many resources available for new beekeepers! There is so much information available, in fact, that every person's learning style can be accommodated.

There are countless beekeeping books, equipment catalogs, videos, online courses and more. Folks should join their local beekeeping club or start one if none are close by. Honey bee conferences and trade shows are excellent learning opportunities, and the networking is invaluable. Following beekeepers on social media is also a good way to learn, especially by following someone local so you can learn what to do and when from someone local. I can say from personal experience that I enjoy sharing beekeeping tips and tricks on social media as well as learning from those I follow!

I also highly recommend that newbies get a mentor and actually go in a honey bee hive to make sure they are comfortable with the bees before they arrive (it's not for everyone). Learning about the beekeeping equipment is essential. You'll be surprised by the amount of useful information found in beekeeping supply catalogs.

Lastly, having plenty of equipment available today, not tomorrow, because the bees won't wait. Takeaway message: Learn first, get bees later and feed the bees!

WHY ARE YOU A MEMBER OF THE ABF?

I am interested in the legislative and policy initiatives of the ABF as well as the amazing educational and outreach opportunities offered. The camaraderie and networking gained when attending ABF's annual conference is pretty special too!

APIARY INSPECTION PROGRAMS AND THEIR ROLE IN THE BEEKEEPING INDUSTRY

by: Brooke Decker (Vermont) with Jennifer Lund (Maine), Dave Priebe (New Hampshire), Kim Skyrm (Massachusetts), Mark Creighton (Connecticut), Joan Mahoney (New York), Natasha Garcia Andersen (D.C.), Cybil Preston (Maryland) and Shanda King (West Virginia)

Since 1938, the Apiary Inspectors of America (AIA) has been working to support beekeepers and the beekeeping industry by promoting better beekeeping practices and ensuring healthy honey bee populations throughout North America. Currently, membership is primarily comprised of apiary inspectors, or apiarists, from more than 40 states, districts and Canadian provinces. Apiary inspectors are often thought of as the "Bee Police," and that is often far from the truth. While regulatory enforcement is part of their responsibilities, most inspectors provide much education, research support and more.

To provide an understanding of the Apiary Inspection Program's role in the beekeeping industry, we'll highlight the diversity and depth of programs in the four regions of the U.S. as well as Canada. Each of these regions provides unique beekeeping opportunities, including specialized honey production, essential pollination needs for our food system, region-specific research support and educational opportunities for hobbyist beekeepers. Programs have varying degrees of support and responsibility within each respective state—some programs are housed within the state agricultural departments or agencies, while others are based out of state universities.

Some states have minimal apiary inspection programming, whereas others maintain a half-dozen full-time inspectors. Even with the differing regulations, staffing and landscapes in each state, one common theme runs throughout all programs—a deep passion for beekeepers, beekeeping and honey bees combined with the promotion of better beekeeping practices throughout North America. This education and outreach often occurs in collaboration with each respective state's bee clubs and associations.

Starting with the eastern region of the U.S., we will share unique aspects of select individual state programs and multi-state collaboration efforts and honor some of the dynamic work performed by apiarists. Ultimately, we want to help break down any barriers or misconceptions that beekeepers might have toward apiary inspection programs and hope that beekeepers understand the important resources these programs provide.

Overview

The eastern region is comprised of the New England states, west to New York and south to West Virginia, Washington, D.C., and Maryland. These states host some of the largest urban areas in the U.S. as well as some of the most rural. This diversity in the landscape is also reflected in the beekeeping community. The urban regions are primarily comprised of hobbyist beekeepers, while the adjacent rural farmlands provide opportunities for sideliner and commercial operations to provide vital pollination services, breed queens and produce honey. While the number of hobbyist beekeepers exceeds the number of individual commercial beekeepers, commercial

operations maintain the majority of the hives in this region. The country's largest and oldest plantings of blueberry, cranberry and apple crops are grown in this region.

"Bee's-eye View" into Eastern Apiary Programs

Maine is home to the country's largest lowbush blueberry crop. Pollination of this crop in May/June, brings upwards of 80,000 hives to the state for pollination services and provides beekeepers with a highly sought-after specialty blueberry honey crop. With mandatory registration, the state has around 1,200 registered beekeepers that manage approximately 10,000 colonies. The one full-time aiary inspector provides between 40 and 60 bee talks per year, conducts the state National Honey Bee Survey and is a major contributor to the Northeastern IPM Center collaborations, promoting Varroa mite IPM education.

Maine blueberries.

Maine apiarist in action during a workshop.

New Hampshire agriculture consists primarily of specialty crops such as pumpkins, strawberries, apples and some blueberries. The apiarist is part-time in the Department of Agriculture, Markets and Food. Registration is not mandatory, so exact numbers of beekeepers or hives are not known. Empirically, the state consists primarily of hobbyist beekeepers with few commercial operations.

Connecticut's apiary program is located within the Office of the State Entomologist and consists of one full-time apiary inspector. In 2019, Connectucut had 562 registered beekeepers managing more than 5,000 colonies. The CT Apiary Program is involved in many educational and outreach programs, including the training of more than 500 beekeepers in Varroa mite management, a youth beekeeping program in local schools and a queen breeder program. The latter resulted in the establishment of the Connecticut Queen Breeders Association. Starting last year, the apiary program began distributing Varroa mite test kits to all Connecticut beekeepers.

Cranberry pollination in Massachusetts.

Massachusetts has over 14,000 acres of cranberry production with the oldest bogs in North America. Hive registration is not mandatory but it is estimated between 4,000 and 4,500 beekeepers manage around 40,000 to 45,000 colonies statewide. The Massachusetts Department of Agricultural Resources (MDAR) Apiary Program is comprised of a full-time apiary inspector and three to four seasonal inspectors who provide both regulatory services and educational programs.

The Massachusetts Chief Inspector is the current president of the AIA and is responsible for coordinating online meetings and regional trainings of New England apiary inspectors. He has also collaborated with the Maine inspector on the Northeastern IPM Center's "A Varroa Mite IPM Program for New England Honey Beekeepers" grant project that provided more than 5,000 mite sampling kits at no cost to beekeepers as well as a webinar series and numerous educational opportunities for beekeepers in the region. Massachusetts has two state apiaries that are used to host educational programs. The honey harvested from these apiaries is donated to local food banks. The MDAR Apiary Program also collaborates closely with UMASS-Amherst to offer regionally specific, hands-on workshops focused on Varroa mite management and honey bee microscopy.

New York is the second-largest producer of apples in the country. Pollination begins in early April in the Hudson Valley region and moves northwest in May. After apples, commercial and sideliner operations provide pollination services for stone fruit (peaches, plums and cherries), berries and pumpkins. Currently, registration is not required, but the department continues to explore the reinstatement of a beekeeper registry to assist the apiary program to focus programming and meet goals.

New York has approximately 5,000 hobbyist beekeepers in the Long Island, NYC, Hudson Valley region. Like most states in the region, New York's 200 commercial beekeepers manage the majority of the state's estimated 80,000 colonies. The apiary program is based in the New York State Department of Agriculture and Markets. It includes three full-time, seasonal inspectors and has a strong partnership with Cornell University, the Dyce Lab for Honeybee Studies and the NY Beekeeper Tech Team. New York has a long history of supporting honey bee health with its first laws related to the industry enacted in 1884.

Vermont's agricultural production is diverse with apples, blueberries and specialty crops, making up a majority of the pollination in the state. Registration is required in Vermont. There are approximately 1,200 beekeepers managing about 14,500 colonies. Commercial beekeepers manage a majority of the colonies in the state. A majority of the commercial beekeepers are migratory, moving hives to southern states during the winter and returning during the warmer months for pollination and honey production.

Vermont has some laws that are unique, including a two-mile radius buffer for commercial apiaries and a required mite mitigation plan for all apiaries. Vermont's apiary program is based in the Agency of Agriculture,

Food and Markets and consists of one full-time apiary inspector and one to two seasonal inspectors. The head apiary inspector collaborates with the Vermont Beekeeper's Association on a Certified Beekeeper Program. The apiary staff also provides pollinator protection education for pesticide applicators as well as pest and disease mitigation workshops for beekeepers.

Rooftop bees in Washington, D.C.

The apiary program in the District of Columbia was established in 2012. Until then, there was only an obscure law that stated you could keep bees as long as they didn't leave the hive. The apiary program consists of one full-time employee and one part-time intern. The District is home to more than 700,000 residents in just 68 square-miles. Because of these close quarters, beekeepers are required to register their colonies and follow density and distance requirements. The District is also home to more than 500 honey bee colonies and 125 beekeepers. Being 100% urban, beekeepers must be very creative with where they keep their hives. Honey bee colonies can be found on the top of the Kennedy Center, on the balconies of row houses, in a ninteenth-century cemetery, at a Franciscan monastery and, probably most famously, in the White House garden. With its close proximity to Maryland and Virginia, the District has good working relationships with the apiary programs nearby.

The Maryland Apiary Program has one full-time apiary inspector, three part-time, seasonal human bee inspectors (contractual), two seasonal K-9 foulbrood detectors and two open contractual, seasonal inspector positions. The majority of Maryland's beekeeping industry is hobbyist beekeepers with a small percentage of commercial beekeepers.

K-9 inspectors in Maryland.

When temperatures are below 52 degrees (November through March), the two certified foulbrood scent detectors certify around 2,000 colonies that move to California for almond pollination as well as several operations that produce nucs for sale. The K-9 inspectors spend April through October on vacation when the human inspectors take over inspecting duties. During that time, the human inspectors also give talks on why bees and beekeepers are important and what the program does to help bees and beekeepers. They often can be found out and about in bee costumes promoting honey bees, honey and beekeeping. Maryland also participates in the National Honey Bee Survey with The Bee Informed Partnership and the Giant Asian Hornet Invasive Survey.

West Virginia's annual beekeeping season commences with the blooming of the state's vast number of maples in February/March and ends with the blooming of the Asters in October. West Virginia is the third most forested state in the United States, so the majority of the honey bee colonies rely on wild sources of nectar and pollen. Over 95% of the state's beekeepers are small-scale, so the focus of the apiary program is equally split between regulatory and educational services.

West Virginia's beekeepers are mostly concentrated in the eastern panhandle of the state which is within commuting distance of the Washington, D.C., metro area and where West Virginia's largest cities are located—Charleston, Huntington and Morgantown. West Virginia has more than 1,200 registered beekeepers who manage a total of approximately 16,000 colonies. West Virginia's apiary program was one of the first to establish best-management practices for its apiary industry. It also has a very active and successful "Veterans and Warriors to Agriculture" program which actively promotes beekeeping and other agricultural opportunities to the state's veterans and first responders.

A look inside the bee inspector's vehicle.

As you can see, apiary inspectors hold a wealth of resources for all beekeepers. Whether you are a commercial or hobbyist beekeeper, the next time you have a question, concern, research idea or need beekeeping advice, reach out to your state inspector. Find your state apiarist and more information about the AIA at *www.apiaryinspectors.org*.

ALFALFA FOR BEE FORAGE AGAIN

by: Dr. Roger Hoopingarner, Professor Emeritus, Michigan State University

In the first-quarter issue of this magazine (*ABF Quarterly* 78-1, pages 24-25), Peter Berthelsen discussed how to influence landowners to plant small amounts of bee-friendly forage. I want to applaud that effort and remind beekeepers that there may be a very bee-friendly forage already on the farms where you keep your bees. That crop is alfalfa. First, some background information, and then I have a plan to make alfalfa a forage plant—again.

Over 100 years ago, a commercial beekeeper in central Michigan had about 700 to 800 colonies. He kept meticulous records on everything—fall and spring colony counts for winter kill and, most important for this discussion, the honey yield per colony for the 60 years he had his beekeeping operation. From about 1905 to 1920, his honey yields fluctuated from year to year because of the seasonal differences, but he averaged 100 pounds per colony over this period. From 1920 to 1940, the per colony average was 200 pounds, and from 1940 to 1963, the average was again 100 pounds per colony. He retired and sold his bees after the 1963 season.

I was amazed at the sharp rise in 1920 to 200 pounds/colony and the sharp drop in 1940 back to 100 pounds. So, I asked for help from the forage expert at Michigan State University. He answered, "That's an easy question. By 1920, the farms in central Michigan had tiled their fields so that alfalfa now could be planted." (Alfalfa doesn't like wet feet.) So, I asked him what happened in 1940 to cause the decline? He said, again, "That's easy. By 1940, we learned that we could cut alfalfa three times." Thus, by eliminating any blossoms from alfalfa, by cutting it in late bud, the bees in the area of the fields were denied 100 pounds of honey per colony.

Two basic reasons explain why alfalfa is cut in late bud. The first stems from a book on forage plants—written about 1940—that showed the greatest percent protein occurs at late bud. The curves of the percent protein shown in the book are greatly exaggerated, and the book also does not discuss the amount of total protein if the plant were allowed to bloom. The other advantage in early cutting is that, in many parts of the farm belt, it allows for an extra cutting and thus for more total hay per season.

One hundred pounds per colony! Forty years ago, when I first wrote about this potential honey yield from alfalfa, I was almost in shock. I wrote then that beekeepers should negotiate with their local farmers to pay them, if necessary, to allow the alfalfa to bloom for a week or more. The farmer gets a greater tonnage per acre with a slightly lower

protein percentage. In fact, the honey may be more valuable than the hay.

From a practical management standpoint, the first cutting of alfalfa should be cut in early bud to help control the alfalfa weevil. It is the second cutting in mid-summer that would provide the benefits to the beekeeper and actually extend the honey flow in many regions.

Now, if we go back to Peter Bertlhelsen's article where he urges beekeepers to negotiate with the landowners where they have their bees located to plant bee-friendly crops to help support the bee population, I contend that the planting for bees may already be there. The beekeeper just needs to unleash it by a little negotiation. In these times, where the landowners may be anxious to help beekeepers, the negotiation may be very easy.

BEE ENGAGED:

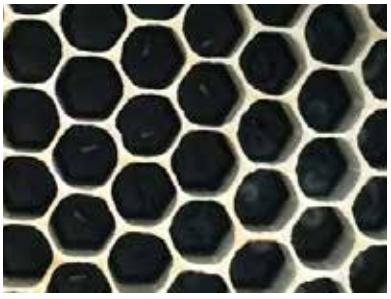
AN AVERAGE JOE'S GUIDE TO BASIC HIVE INSPECTIONS

by: Joseph "Joe" J. Komperda, Sr.,
The Average Joe Beekeeper,
Certified Master Beekeeper,
Happy Busy Bees and Colorado
State Delegate to the ABF

We've all heard the saying "beekeeping is local," but it is also dependent on the goals and objectives of the beekeeper. Practices used by sideliners and hobbyists can vary greatly from techniques practiced by commercial beekeepers. No matter what level of beekeeping you're at, experience dictates methods used in your beekeeping routine.

For hive inspections, this Average Joe's Guide addresses newer, less experienced beekeepers who wonder what an inspection is and when it should be performed. My rule is to have a plan or reason for your inspection.

As we approach the summer solstice, inspections can become a great educator. Getting into the hive on a weekly basis provides insight into bee biology. Identifying eggs and their position on the cell bottom, larvae and their various sizes (pictured here) and capped brood versus bee

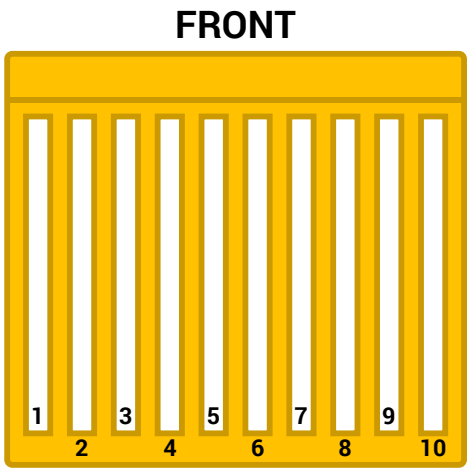


bread and capped honey contributes to bee knowledge. Seeing pollen being brought in, trophallaxis between workers, the difference between a worker and drone and even locating the queen are all part of the wonder of the hive. Without inspections, you can't appreciate these sights!

With newer hives, equipment needs can be determined via inspection. In Langstroth hives, once comb is drawn out on seven or eight frames, it's time to add a second box. When that box is built out, add a super. Surprisingly, this can happen in a week or two. If you only inspect once a month, you'll miss the milestones in the colony build up.

Some newer beekeepers won't inspect for fear of rolling and killing their queen. When inspecting, I start by removing the second frame on the left side of my hive, as I've found the queen is less likely to be there. Before going deeper into my inspection process, I want to point out my frame numbering system.

In my research, I haven't been able to identify a standard for numbering the frames in a hive. While standing behind the hive, I designate the left frame as #1 with the right frame as #10 (diagramed here). When talking about a stack of brood boxes, whether deeps, mediums or a combination, the top will always be designated T while the bottom is B. With a third box, it is in the middle, so it is M. My hives and nucs are uniquely numbered so all numbers start with H for hives while N indicates a nuc. Finding a queen on frame #4 in the top of hive 8 would be annotated as H08T04. Drone brood



on the top of the fifth frame in the bottom deep would be H08B05. Supers start with S and are numbered bottom to top.

Back to inspections, I try to consistently follow a standard procedure or routine, although that's not always possible. As I observe my colony, I record my findings in the same sequence. I normally start with frame #2, however earlier (or later) in the season I may start on frame #3 or #4 depending on the density of bees. Using a frame rest or spare nuc box, I place the first one or two inspected frames outside the hive to open the space for frame movement. I then look at the next few frames and observe the number of bees, extent of brood coverage (pictured here), honey, nectar and bee bread. By frame #7, I have usually seen everything I set out to see in my plan for that session.

Some people will tell you that you should use smoke during your inspection. I like to light a smoker "just in case" but prefer to not use it if not needed. Depending on the time of year, the flow, weather, number of bees, colony temperament and other factors, you might want to use smoke. For those who say smoke sets a hive back, you might mist sugar water to calm the bees down via distraction. Likewise, a one-quart bottle of water mixed with one ounce of Liquid Smoke (available in grocery stores) provides a smoky mist on the bees. Both alternatives can help calm the colony, but you may have to revert to the smoker.

While you're inspecting, it's a great time to grab a half-cup of bees and perform a mite count. Whether you prefer a sugar shake or an alcohol wash, a mite count goes a long way toward effectively managing your bees. You should perform a mite count monthly from April through October, so include them in your inspection plans.

Understanding the bee life cycle or "Bee Math" helps in completing your inspection even if you haven't seen everything you wanted to see. With eggs in cells, you know the queen is there and had been laying in the last three days. Observation and knowledge make you a better beekeeper.

You might see queen cups or emergency cells (pictured here). Newer beekeepers may panic as they believe a swarm is imminent. Don't worry, bees are amazingly efficient. They will build these structures "just in case."

If it is filled with royal jelly (pictured below), supersedure may be underway. Depending on where the cell is located, you may also be witnessing swarm preparation. Plan your next inspections to track the growth, emergence and actions of a new royal!

If it is swarm season, you need to understand that a queen cell can be completed in eight days from egg laying to capped cell. In about six or seven more days, a swarm may fly. If you're inspecting once every other week or less, you could miss the swarm entirely. Looking in the hive after a swarm rarely demonstrates that your numbers have diminished. Regular inspections help you gauge the number of bees in the hive. One side of a deep frame that's completely covered with one layer of live bees contains around 1,500 bees. Many times, you'll find bees stacked on top of each other increasing those numbers. Counting frames of bees quickly gives an indication of the colony's actual size. By estimating capped and uncapped areas of your frames, you'll receive insight on the colony's size in the next week or two. You need for a regular look inside of your hive.

For the Average Joe it is important to get into hives on a weekly basis, both early in the season and early in the beekeeping career. As time progresses, you'll learn more, and as your knowledge and hive count increases, your inspection frequency may lessen. No matter where you are in your beekeeping adventure, inspections can help you determine the health and vibrancy of your colony and reveal the marvels of your bees!

Photos and diagrams by Joe and Debbie Komperda, Happy Busy Bees.

QUEEN Committee Report

by: Anna Kettlewell, *American Honey Queen Program Chair*

We are living in a new world, filled with a lot of uncertainty right now. The one thing that does seem certain is that we need honey bees to pollinate our crops and create honey for consumers. I pray that we can continue our work for consumers nationwide over the next many months and resume normal activities soon.

As you'll read in Mary and Sydnie's articles, their travels came to a screeching halt in the second week of March. While they continue to work at home on YouTube videos, Facebook posts, reports and scrapbooks, we have a lot of free time now on their calendars. With most schools moving to online formats for the duration of the COVID-19 crisis, the American Honey Queen Program is offering online programming to virtual school platforms. We started this work last year, reaching year-round virtual schools, and hope to make this crisis an opportunity to expand that promotional avenue.

Mary and Sydnie each produced a Facebook Live video in March—one on the American Honey Queen Program's page and another on the American Beekeeping Federation's site. They will continue to produce Facebook Live and YouTube videos to promote our products, but we'd love to schedule more interactive online presentations for them and students throughout the country.

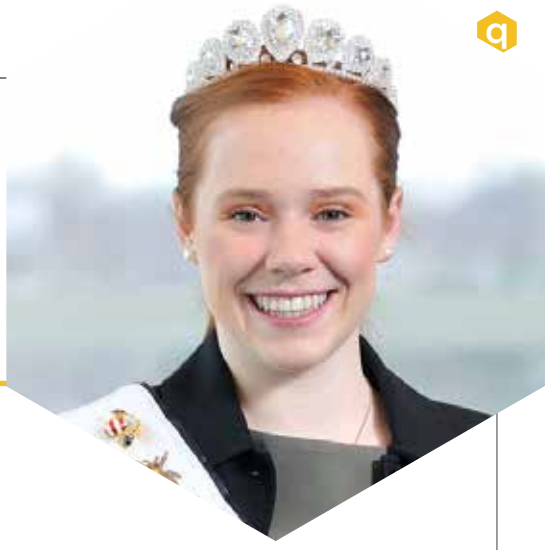
If you have a child in a school studying virtually, reach out to their teacher to see if we can schedule a Zoom or Skype presentation for the class. The benefit of giving these presentations live on these platforms is that students can truly interact. They can ask questions of the queens as if the queens were standing in their classroom, making it an ideal learning setting. We also can schedule these types of presentations for other groups, including live cooking with honey demonstrations.

I have many requests for the summer and fall. I hope that we'll be back to regular travel again soon. In the meantime, Mary and Sydnie will continue promotional work in their homes to the greatest extent possible.

Please contact me at *honeyqueen99@hotmail.com* or 414-545-5514 with your virtual school leads and promotional dates.

AMERICAN HONEY QUEEN REPORT

Mary Reisinger



As we are clustered in our homes, the bees are busy ensuring pollination will continue as planned. I hope your bees are as busy as mine have been and that you are starting to see a wide color array of pollen and fresh honey.

Right after onboarding training in Wisconsin, I traveled to warmer weather in Florida for the Florida State Fair. I worked at the "Fresh from Florida" breakfast with more than 400 attendees. I met Florida's Agricultural Commissioner Nikki Fried, with whom I spoke briefly about the importance of honey bees in pollination and how they bridge many industries. At the Florida State Beekeepers Association booth, I handed out samples of honey found in Florida—mangrove, wildflower and, of course, orange blossom. I also gave tips on ways to use honey in our everyday lives.

Queen Mary gave samples of Florida's finest honey varietals at the Florida State Fair in February.

I attended the Tampa Bay Beekeepers Association monthly meeting to speak on giving effective beekeeping presentations to the general public and the benefits of membership with the ABF. I also assisted Stephanie Ramthun in a "Beekeeping Experience" tour. We instructed participants on basic honey bee biology, necessary equipment of beekeeping, the beekeeping year and what we look for in a beehive. The attendees then geared up, and we walked through a live hive inspection. It was a great way to give people a brief glimpse into how much work goes into managing a single hive of bees! Thank you to the Florida State Beekeepers Association for sponsoring my trip and to Bert and Caryl Kelley and Stephanie and Christian Ramthun for being such generous hosts during my stay!

The following weekend, Sydnie and I attended the University of Minnesota's "Beekeeping in Northern Climates" course. The amazing course was completely sold out, with more than 340 people attending. We encouraged membership in the ABF while staffing a table during the tradeshow. I learned more about the different challenges honey bees face across the nation, especially those in the northern states. Dr. Marla Spivak emphasized proper handling of frames and the importance of being comfortable working hives without gloves. Many thanks to Dr. Spivak and Gary Reuter for sharing their forefront knowledge with us and to Terry McDaniels for opening her home to us.

Next, in Indiana, I was off and running the moment my plane landed in Indianapolis. I had my first radio interview alongside ABF Director Debbie Seib on WFYI NPR, reaching thousands of people. Following the interview, I met with representatives from Clif Bar. They recently came out with a peanut butter and honey bar and sponsored the Indiana Bee School that weekend. At the Indiana Bee School, I had two live television interviews with WISH-TV, where we talked about the importance of honey bee pollination and beekeeping in Indiana. I also had the pleasure of working with Indiana Honey Queen Mikayla Ricketts for the day. I'd like to say thank you to The Beekeepers of the Indiana organization and Debbie and Mike Seib for organizing and taking excellent care of me for the weekend.

I then headed a little further south to Kentucky for the Bluegrass Bee School and a week full of educational outreach before the event. During my week in the Lexington area, I gave 12 school presentations reaching more than 900 students and was interviewed on WDKY Fox 56 television and WEKU NPR radio! A highlight of the trip was speaking to staff at the Kentucky Governor's mansion.

Former Kentucky Governor Bert Combs was a beekeeper, and ever since then, there have been beehives in the mansion garden. As I was leaving, I met First Lady Britainy Beshear walking her dog. We talked for a good while, as she shared her enthusiasm for using honey in her everyday smoothies. I left her with some information about beekeeping in Kentucky and ideas for using honey beyond the kitchen.

Kentucky State Apiarist Tammy Horn and I met with Agricultural Commissioner Ryan Quarles and discussed efforts the state is making to ensure honey bee health. During the Bluegrass Bee School, I taught a class about educating customers on uses of honey and emphasized the value of cooking and product demonstrations. I especially thank John Antenucci for organizing my visit, John and Ruth Jeffers for hosting me and all the members of the Capital City Beekeepers Association and the Bluegrass Beekeepers Association for sponsoring my visit.

We came across a stumbling block to our travels due to the COVID-19 outbreak, but Sydnie and I are excited to continue promoting this sweet industry through online means. We will be posting videos through Facebook Live and YouTube as well as giving online presentations whenever possible. In fact, one of my goals this year is to give 35 remote presentations. We'd love your help in reaching schools studying online. If you have a contact in your area, please connect them with Anna Kettlewell to schedule a remote presentation. We also have a blog geared for elementary and middle school students containing articles explaining different aspects of honey, honey bees and pollination, a Q&A section and many recipes with honey to try! Visit www.BuzzingAcrossAmerica.com to check it out!

I look forward to getting back on the road as soon as possible. I hope and pray you, your family and your honey bees remain in good health. Don't forget to follow our Facebook page at AmericanHoneyQueenProgram to stay up to date on our adventures and our online presentations! Thank you for your support! If you are interested in scheduling a promotion with Princess Sydnie or me, please contact Anna Kettlewell at *honeyqueen99@hotmail.com* or 414-545-5514.

AMERICAN HONEY PRINCESS REPORT

Sydnie Paulsrud

Spring is in full bloom around the United States. I hope everyone is ready for rain, flowers and buzzing bees! Things have been a little busy since Queen Mary and I completed our onboarding training in February, and that training proved useful in our next months of promotion.

My first promotional event alone this year was an interview with *Leader Telegram*, a Eau Claire, Wisconsin, newspaper. The reporter enjoyed learning about what I do as a national spokesperson for the ABF. I spoke about our wonderful honey bees, the fact that one-third of our food supply requires pollination and how 80% of those pollinators are honey bees. This news article alone printed a little over 41,000 copies! I later had an interview with WAXX 104.5 radio in Eau Claire. The interview was part of the Midwest Farm Report network, reaching more than 20 affiliate stations in the state. I spoke with Scott Schultz for about 10 minutes, discussing the tremendous impact honey bees have on our nation's agriculture and the 300 varieties of honey they produce nationwide.

I shared a special school presentation with Queen Mary when we spoke at my little brother and sister's school in Wisconsin! Messiah Lutheran School had us speak two different times during the day—first to a group of third and fourth graders then to first and second graders, totaling 65 children. They were intrigued to learn about honey bees and enjoyed looking through our blog, www.BuzzingAcrossAmerica.com.

The next part of our journey included the University of Minnesota's Beekeeping in Northern Climates course. Beyond learning new ways to take care of honey bees and their habitats, Mary and I hosted a booth during breaks on the first day. We explained the benefits of ABF membership to attendees and what the organization entails. We also shared information on the American Honey Queen Program. It was such a pleasure to meet Dr. Marla Spivak and Gary Reuter, who put everything together and gave us a spot to promote ABF. It was a great course for anyone from beginner to a commercial beekeeper. There is always something new to learn in the world of honey bees!

I later made a stop in Fort Wayne, Indiana. While I was supposed to present to multiple classes over

Princess Sydnie gave attendees honey recipe brochures at the Fort Wayne Home and Garden Expo.

three days, things didn't go as planned. Wintery weather and snow closed all schools in the surrounding area every day I was there! Thankfully, my wonderful hosts, Duane and Alice Rekeweg, brought me to the Fort Wayne Home and Garden Expo instead, where I spoke to hundreds of people about beekeeping and anything they wanted to know about honey bees. I worked with the Northeastern Indiana Beekeepers Association at their booth and handed out recipe brochures to anyone interested. I also snagged a few interviews for the industry!

I spoke live with WOWO News/Talk 1190 AM and 107.5 FM about the importance of honey bee pollination. Later, I interviewed with channel WANE 15 about what we can do to help our honey bees thrive. Outside the expo, I had two newspaper interviews with the Decatur Daily Democrat and the Berne Witness. I am so thankful we made lemonade out of the lemons the weather provided!

Before the start of sheltering in place, I made my way to Gainesville, Florida, to attend the University of Florida's Bee College. It was a two-day event consisting of multiple classes every hour. I had the honor of listening in on a few of Dr. Jamie Ellis's classes—one about swarms and another about honey bee stings and the anatomy of the stinger. I can say for certain that I learned many things I didn't know before!

During a break in classes, I joined Dr. Ellis and his extension coordinator, Amy Vu, in their podcast: Two Bees in a Podcast. This duration consisted entirely of discussion about the American Honey Queen Program. Their podcast includes great guest speakers and covers many topics and answers to questions people may have. Check out their podcast at *http://entnemdept.ufl.edu/honey-bee/podcast*. The short course also had a honey show and awards social the first night. I spoke about ABF and told the attendees all about what we have to offer. I really enjoyed attending two very different (and productive) beekeeping short courses.

Princess Sydnie participated in Dr. Jamie Ellis and Amy Vu's "Two Bees in a Podcast."

I was scheduled to fly to Texas and Connecticut for a total duration of 10 days, but plans changed because of COVID-19 and its impact on travel. However, Mary and I plan to give online presentations for families that are staying home as well. We are excited and wish everyone the utmost health and safety. We will roll out some Facebook Live videos for people to enjoy during this sticky situation.

If you or anyone you know has an event in mind and would like either Mary or I to attend, please contact Anna Kettlewell at 414-545-5514 or *honeyqueen99@hotmail.com*. We would love as many online presentations as possible to spread our love of honey bees to all ages. Please forward information to your local schools that are studying remotely! In the meantime, be sure to have a look at our Facebook page (AmericanHoneyQueenProgram) and YouTube channel (AmericanHoneyQueen). Have a honey of a summer, everyone!

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