

Spring
2022



AIA



Newsletter for members of
Apiary Inspectors of America



Harsh light of reality



Two photos from the same frame of brood with American foulbrood scale. The smaller photo is the frame without using any aid. In the larger photo, the teal-green color that indicates American foulbrood scale emerges under UV lighting. (Photos courtesy Don Hopkins, North Carolina Department of Agriculture, who credits Tim Schuler, then-New Jersey state apiarist, for the tip of adding a UV flashlight to your state apiarist's toolbox.)

American foulbrood: Long-time adversary of apiary inspectors

By Tammy Potter
Kentucky State
Apiarist

American foulbrood (AFB) is easily the most contagious disease affecting honey bee hives. In fact, the United States Department of Agriculture created state apiarists precisely to control AFB in the 19th century, arming apiarists with a badge and a rifle, since many apiarists had to ride to apiaries in horse-drawn wagons without any guards.

Though the working conditions for apiarists have improved, not much has changed since then in terms of the contagious nature of AFB. An apiarist cannot tell from visible symptoms which of the identified strains is impacting a hive.

Several noted researchers had worked on developing AFB-resistant honey bees, but those efforts stalled when antibiotics became readily available in the 1950s. Predictably, the AFB bacteria developed resistance to antibiotics, notably oxytetracycline (Terramycin).

In an effort to reduce antibiotic resistance in food-producing animals, the Food and Drug Administration began to require prescriptions or a **Veterinary Feed Directive (VFD)**

See **AMERICAN**, next page

AMERICAN... *from last page*

for antibiotics to suppress AFB in 2017. Consequently, there have been several notable outbreaks of AFB across the United States. State apiarists typically become involved in these cases because AFB is a “reportable disease.”

Since antibiotics do not “cure” this disease, apiarists have limited options to offer beekeepers. By far the most effective is destruction of colonies as soon as possible.

How to burn AFB equipment: Wait until evening when the bees have returned. Dig a hole large enough to hold the equipment. Kill the bees by dumping a five-gallon pail of water mixed with one cup of dish soap into the colony from the top. When burning, put in frames first, then boxes. Cover the pit when finished.

Beekeepers can choose to have a veterinarian prescribe a VFD for an antibiotic, such as Terramycin. However, the disease can outlast the antibiotic, and the beekeeper will have to request another VFD in six months.

Some states allow a beekeeper to shake older bees onto brand-new equipment, but this method may allow AFB to impact the bees in the new colony, necessitating destruction.

Rope test

AFB is noticeable for its foul odor, sunken pupal cappings, and molten discolored larvae under the wax cappings. The **rope test** is a reliable field test for this disease. An apiarist or beekeeper uses a toothpick or piece of straw to puncture the wax capping. If the larvae forms a string (or “rope”) on the toothpick and “snaps” back, the disease is present in the hive.



UV-light confirmation



Jenna Crowder at the Utah Honey Harvest Festival in Grantsville.

Another tool useful for the state apiarist kit is a **UV flashlight**, emitting at least **400 nanometers** (nm). Visible light has wavelengths of 400-700 nm (a nanometer is one-billionth of a meter). “Any brand advertised to emit UV light in the 400nm range should do,” says **Jenna Crowder**, diagnostic entomologist



State apiarists typically have diagnostic kits to provide a five-minute diagnosis, but the kits can sometimes give “false positives.” So, having an extra diagnostic kit is always advised.

from the **Utah Department of Agriculture**. The UV flashlight, Crowder explains, is a highly portable and field-friendly way to confirm a field diagnoses and show beekeepers the often difficult-to-see dried larval scale. UV lights cost about \$15 at local hardware stores.

A hive with AFB under UV light will reflect a teal-blue or -green color from an infected frame of brood (*see photos, page 1*). Although you do not have to be in full darkness, you will see the teal-green coloration more easily in shade, Crowder said. Point the light at the bottom of the suspect brood cells and look for fluorescence from the AFB scale.

Since some pollen also exhibits fluorescence under UV light, Crowder recommends always taking a sample back to the lab for PCR analysis.

Disciplined response

No apiarist wants to hear hives have AFB. As with everything in beekeeping, when AFB impacts a hive or apiary, good beekeepers get better and bad beekeepers get out. Good beekeepers will be more careful disinfecting equipment, more cautious from whom they buy nucs, and more cognizant about space between hives and apiaries, plus taking other safeguards.

Potter also reminds beekeepers to have a “quarantine yard” where nucs or cut-outs can be isolated for a few weeks to assess the health of incoming bees before immersing them in an apiary, especially one in which queens are produced.

If you encounter an AFB hive, at least arrange to seal an AFB-infected frame in a display case, which “makes a great interactive tool for outreach events,” Crowder said.

youtu.be/z0B9o4GHq7U

A lecture by **Dr. Kirsty Stainton** at the 2018 National Honey Show, on “AFB/EFB typing and chronic bee paralysis virus.”



Dr. Kirsty Stainton.

Canada faces regional challenges over 2021

Weather was a major driver in Canadian beekeeping in 2021. Beekeepers continue replacing lost colonies, and management of Varroa mites is still a major challenge for many beekeepers, reports **Paul Kozak**, provincial apiarist, Ministry of Agriculture Food and Rural Affairs, Animal Health and Welfare Branch.

Colony mortality (following the 2020 / 2021 winter) in Canada was 23.2 percent across Canada with most provinces (other than AB and BC) below 20 percent.

Western Canada experienced serious droughts and heat waves while in Eastern Canada the early spring influenced the early increase of Varroa levels. Even though supply chain issues may have slowed things down, beekeepers were able to import queen bees from California and Hawaii.

2021: Beekeepers in Canada
Total in Canada: 13,105; (2020: 11,994)



(* = supplied by Provincial Apiary Program) [Source: Statistics Canada (via provincial apiary program registration data)]

An increase of more than 1,000 beekeepers took place in Canada from 2020 to 2021. Pop quiz for Yanks: Can you expand the province abbreviations?

AHPA award recognizes decades of Kim Flottum's involvement

From teaching in the Department of Entomology at University of Wisconsin, to discussing pesticides from the perspectives of farmers and bees at the USDA Honey Bee Research Lab in Wisconsin, to spending 33 years as editor of *Bee Culture* magazine, **Kim Flottum** has been immersed in beekeeping for decades.

The **American Honey Producers Association (AHPA)** extended its **2021 Beekeeper of the Year Award** to Kim, who thanked many group members for teaching and mentoring him through his first beekeeping years.

You can hear Kim on the "Beekeeping Today" podcast and the "Honey Bee Obscura" podcast.

AHPA interview with Kim on the AHPA Facebook page: facebook.com/AmericanHoneyProducersAssociation/photos/a.2726123271046028/3165839810407703
Podcasts: beekeepingtodaypodcast.com and honeybeeobscura.com



Dr. Medhat Nasr earns WAS 2021 Presidential Award

The **Western Apicultural Society (WAS) 2021 Presidential Recognition Award** was awarded to **Dr. Medhat Nasr**, research scientist, bee health consultant, and retired Provincial Apiculturist at the **Alberta Ministry of Agriculture, Forestry and Rural Economic Development**.

Dr. Nasr received the award for his groundbreaking work on Varroa mites and mite control. He pioneered oxalic acid treatments and is identifying other control options. The announcement from WAS called Dr. Nasr "an indispensable resource to beekeepers." He is past president of the **Canadian Association of Professional Apiculturists** and a lifetime member of many beekeeping organizations across Canada and the U.S.

WAS specifically represents beekeepers in the Canadian provinces of Alberta, British Columbia, Saskatchewan, and the Yukon; the western United States; and northern Mexico.



Dr. Medhat Nasr.

An overview of the 2022 American Bee Research Conference

By

Paul Kozak, Provincial Apiarist,
Ontario Ministry of Agriculture,
Food and Rural Affairs

and

Dr. Colette Mesher, Lead Specialist,
Technology Transfer Program,
Ontario Beekeepers' Association



Paul Kozak.



Dr. Colette Mesher.

It is 2022 and we are still attending online / Zoom conferences. Many of us miss the conversations over coffee and the opportunities to network directly with researchers and specialists.

However, there is some convenience in seeing honey bee research from all over North America from the comfort of your home. This is definitely the case for the **2022 American Bee Research Conference (ABRC)**.

This year's conference was special, as the **Apiary Inspectors of America** (all the apiary inspection programs in Canada and the USA), the **Canadian Association of Professional Apiculturists** (Canadian bee researchers), and the **American Association of Professional Apiarists** (USA bee researchers) all collaborated on one large conference that captured the foundational and applied research as well as projects on outreach and extension for apiculture in North America.

Themes were explored of chemical ecology and behavior; pests, pathogens and beneficial microbes; genetics, breeding, and evolution; beekeeping management, outreach, and education; and pesticides and acaricides. A few highlights and talks that stood out to us:

Precocious foraging

The phenomenon of precocious foragers in honey bee colonies was addressed in two studies. This is when the majority of older foragers are missing in a colony as a cohort and younger bees began the task of foraging much

earlier. This can lead to its own cascading impacts on short-term production and longer-term colony viability. In addition, there are questions as to what is the driving, underlying cause of precocious foraging in colonies.

Two graduate students had research projects examining potential stressors causing precocious foraging – high Varroa levels within colonies (**J. Twombly** of Texas A&M University) and pesticide exposure (**R. Tokach**, University of Nebraska-Lincoln).

Varroa mite vectoring

Kaitlin Deutsch, Cornell University, examined the major role of Varroa mites in driving virus patterns in bumble bee communities. Mites act as vectors and increase the prevalence and levels of viruses in honey bee colonies. Varroa mites cannot infest bumble bee colonies as they do with honey bees, as the mites' life cycle is so closely aligned with the life cycle of honey bees. However, viruses in honey bees can infect bumble bees and other species of bees when they come in contact with each other.

The researchers sampled viruses (namely deformed wing virus) from honey bees and bumble bees, and examined Varroa levels in different colonies. They found that areas where honey bee colonies had effectively managed their Varroa mites (lower levels of Varroa) also had lower prevalence of this virus in the surrounding populations of bumble bees. It is good news that the exact same measures for managing Varroa mites that beekeepers need to follow for their own colonies' health can also mitigate the disease transmission of bee pathogens to bumble bees.

See **CONFERENCE**, next page

CONFERENCE ... from last page

This is especially timely work, as it has been understood for some time that honey bees can share pathogens with other species of bees. Now, there is another reason to manage Varroa mites.

Best communication practices

It was great to see communication methods and outreach efforts covered at the ABRC. The scientific research helps explain stressors on honey bees and provides appropriate management practices. However, without effective communication this research cannot effectively help the industry.

Over the past decades, various regional programs have worked with beekeepers to develop detailed **integrated pest management (IPM)** programs. **Selina Bruckner** of Auburn University compared different formats for best beekeeper response and adoption of IPM practices. Online courses show promise, but cannot completely replace in-person and hands-on learning for training beekeepers.

DWV variants A and B

Keynote **Robert Paxton** (Martin-Luther-University Halle-Wittenberg); “Is DWV-B taking over from DWV-A, and does it matter?” **Deformed Wing Virus (DWV)**, vectored by Varroa, makes newly emerged bees weak and unable to fly. Research into DWV has lagged research into Varroa. Findings in the last few years have disclosed multiple variants of DWV. The work, conducted in England and Germany, indicate the need to further research the implications variants can have on colony health.

Unfortunately, much as we see with COVID-19, which variant is dominant in your colony does have an impact. Variant DWV-B has been shown to be more virulent than DWV-A, as well as now being the more commonly found strain. It does matter which variant is present — and likely there are more unidentified variants yet to be discovered.

In the next article in this two-part series, we will continue to summarize some new, important research presented at the 2022 ABRC, including the other keynote address by **Dr. Nuria Morfin**, formerly of the University of Guelph Honey Bee Research Center and now the new lead technology transfer specialist in British Columbia.



Dr. Lilia de Guzman.

Dr. Lilia de Guzman named AIA 2021 Researcher of the Year

AIA awarded **2021 Researcher of the Year** honors to **Dr. Lilia de Guzman**, recently retired from the **USDA Baton Rouge Bee Lab**.

Throughout her career, she studied Varroa mites and tracheal mite resistance in Yugoslavian and Russian honey bees. She concluded her career by studying grooming behavior of Russian honey bees against Varroa. She also focused on methods to control small hive beetles.



Dr. Judy Wu-Smart.

Nebraska entomologist Dr. Judy Wu-Smart gives best ABF conference presentation

Dr. Judy Wu-Smart, University of Nebraska entomologist and leader of their Bee Lab, is the 2022 recipient of the **Dr. Roger Hoopingartner Award** for the Best Scientific Presentation at the **American Beekeeping Federation’ (ABF) Conference** in Las Vegas. Dr. Wu-Smart’s presentation was titled “Investigating persistent beekills from systemic pesticide pollution, and implications to beekeepers.”

Dr. Wu-Smart, a California native, has also presided over the American Association for Professional Apiculturists. She is on the boards of the Entomological Society of America and the Nebraska Beekeepers Association.

Utah publishes interesting, colorful annual insect report

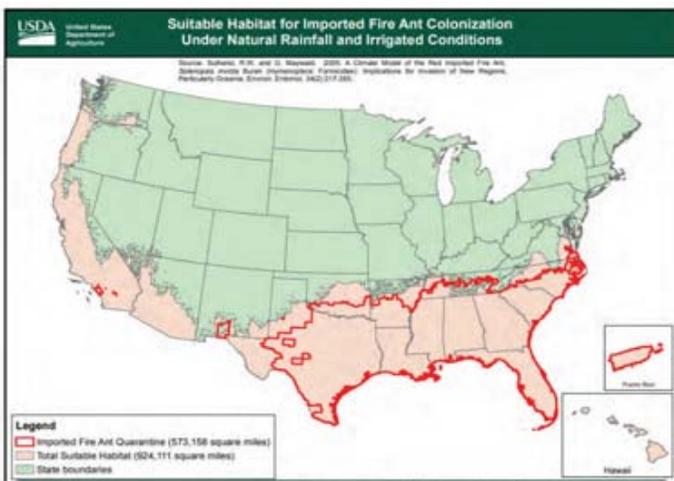
Our compliments to the **Utah Department of Agriculture and Food (UDAF) Insect Program** on the publication of their **Annual Insect Report** for 2021.

This 24-page annual report summarizes all the insect-related work done in Utah, from invasive species mitigation to the Utah Apiary Program. This year's report was put together by diagnostic entomologist **Jenna Crowder** and **Joey Caputo**.

In addition to the important technical data and progress reports on the fight against several invasive insects, the report is lavishly and colorfully illustrated, not without a touch of humor (we're not sure that 20-foot-tall invasive fire ants are actually stomping through Utah streets, but the visual is certainly attention-arresting, and humor is a great untapped force in annual report publishing).

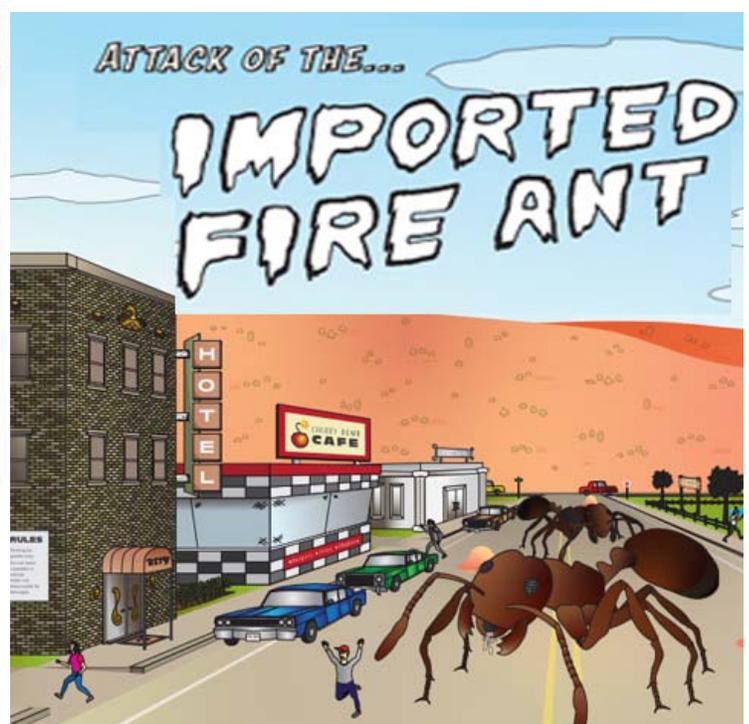
The book succeeds in conveying quite a vibrant visual dimension to our too-often-invisible struggle against invasives.

The report is available online at ag.utah.gov/wp-content/uploads/2022/02/2021-Insect-Report-Web-Edition-V1.0-Compressed.pdf



Coming soon to your town

The summary of Utah's 2021 efforts against imported red and black fire ants has useful information on current and possible habitat (*the red areas on the map above*) and containment efforts. The data is leavened with a dash of sci-fi movie humor in its leadoff illustration (*right*). When in Utah, giant ants permitting, plan a visit to the **Cherry Bomb Cafe**.



Honey bees, colonists spread nationwide once introduced in Jamestown, Va., in 1621

By Keith Tignor

Office of Plant Industry Services
Virginia Department of Agriculture
and Consumer Services

————— oOo —————

*“Wee haue, by this Shipp and the Discoverie [Discovery], sent you diuers sortes of seedes, and fruit trees, as also Pidgeons, Connies, Peacokes Maistiues, and **Beehives** ... the preservation & encrease whereof we respond unto you”*

————— oOo —————

This single line in a letter from the Council of the Virginia Company dated Dec. 5, 1621, was the pronouncement of honey bees coming to Virginia. Honey bees in North America were unknown before the Spanish, French, English, and other European explorers and later settlers crossed the Atlantic Ocean to the New World. ...

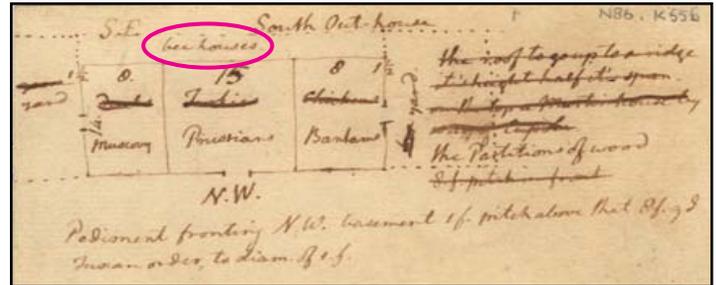
Along with the *Discovery* (mentioned above), the *Bona Nova* and *Hopewell* left England in Nov. 1621. ... It is believed these were the ships referenced in the letter from the Council of the Virginia Company. ...

Shipmate bees, humans co-exist

This would have been a long journey for humans and bees alike, especially together in a confined space. Honey bees swarming throughout the vessels would have been less than desirable. The November timing for shipping bees would have taken advantage of the cold winter temperatures of the Atlantic and likely would have kept the bees clustered in their skeps or gums throughout the journey. ...

The arrival of honey bees came at a challenging time for the colonists at Jamestown and surrounding countryside. The fall of 1621 saw an escalation in conflicts between the colonists and Native Americans. Clashes culminated with a massacre in March, 1622 of 347 colonists. ...

There is no record of who received the bees or what happened to them upon their arrival. ... Frequent writings of honey bee swarms and bee trees would indicate they soon escaped into the surrounding forests.



Thomas Jefferson's hand-drawn diagram of the South Out House at the Monticello estate. Note the mention of "bee houses" near the top. (From the Coolidge Collection of Jefferson manuscripts at the Massachusetts Historical Society.)

Jefferson mentions honey bees

Thomas Jefferson in *Notes on the State of Virginia* (1785) wrote, "The Indians concur with us in the tradition that it [the honey bee] was brought from Europe; but when, and by whom, we know not. The bees have generally extended themselves into the country, a little in advance of the white settlers. The Indians therefore call them the 'white man's fly,' and consider their approach as indicating the approach of the settlements of the whites."

Two conclusions can be inferred from Jefferson's remarks. First, at least some of the bee colonies survived the journey from England in 1622 to become a recognized part of Virginia's landscape. Second, honey bees were closely associated with, and "managed" by, the European settlers.

No management as such

Use of the term "managed" may be a stretch, as beekeeping in the 17th and 18th centuries often consisted of sacrificing a hive or felling a tree to rob its honey and beeswax.

More practical beehives like the Collateral Hive for maintaining a colony of bees from year to year while harvesting honey and wax eventually came into use but were not widespread until the 20th century. ...

The products of the hive, honey and beeswax, became marketable commodities. The value of these items for early Virginia farmers were 2s (shillings) per pound for honey and £4 (British pounds) per 100 pounds for beeswax. One planter, George Pelton, reportedly earned £30 a year from his bees in 1648. ...

Honey was a common food, given few households were without hives under the eaves of their outbuildings.

See **VIRGINIA**, next page

VIRGINIA... *from last page*

The common use of beeswax for candles is questionable; other abundant plants could be made into candles with a pleasant fragrance, which would compete with those of the finest beeswax. Other reasons for limiting its use in candle making include the value of beeswax as a trade commodity and its use in other industries as, for example, a sealant.

By the mid-18th century beeswax was regularly being exported from Virginia. The total exported from Virginia in 1730 was roughly 343,900 pounds. At £2,500 per ton, a hefty profit could be attained by exporting beeswax.

Spreads to other states

Beekeeping expanded beyond Jamestown throughout Virginia and North America. The second import of honey bees from England occurred in 1638, to the Pilgrims in Massachusetts. Honey bees were present in Connecticut by 1644, and New York in 1670. By 1674, apiaries were mentioned in records of the Prerogative Court of Maryland. Honey bees were recorded in North Carolina by 1730. By the 1850s, honey bees were being shipped from Eastern states to the Pacific Coast. Likely some of these honey bees, especially along the east coast, originated from Virginia as

the Commonwealth did brisk business with Massachusetts and other English colonies.

The honey bee is integral to the lives of beekeepers, farmers, and diners. European colonists brought fruits, vegetables and nuts that co-evolved with the honey bee, many dependent on the latter's presence.

Much has changed in Virginia and agriculture since the 17th century. Nationally, honey bee pollination, honey and beeswax is now valued at more than \$20 billion. The honey bee population in Virginia has surpassed 8.5 million.

Most of this growth is in urban centers. Urbanization since that first census has shifted from less than two percent of the population to 80 percent in 2020. Today the backyard urban, suburban, and exurban beekeeper is the norm rather than the exception.

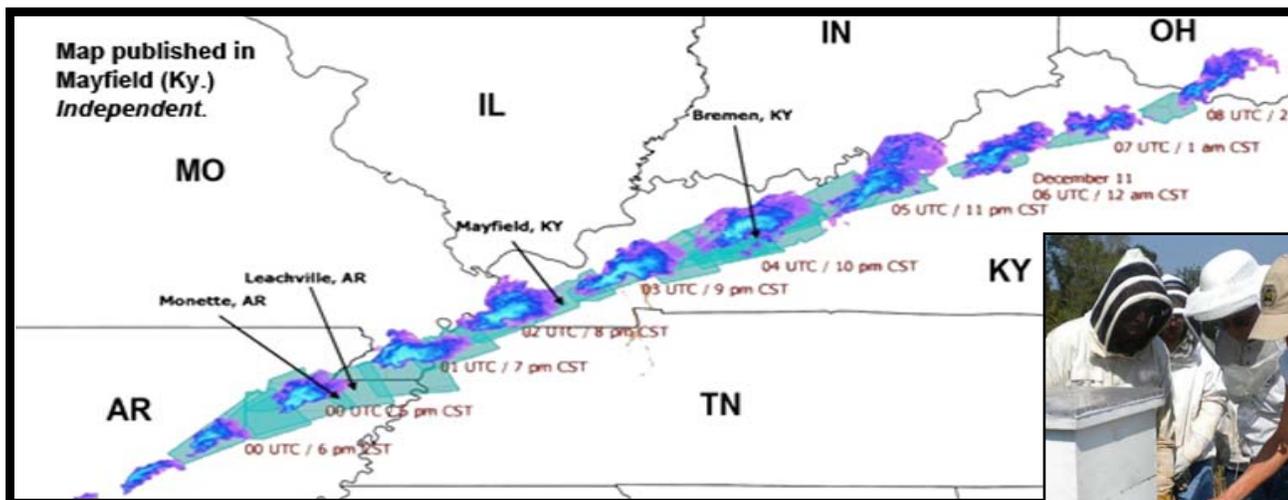
Beekeeping in Virginia today is predominately a hobby for enjoying the products of the hive and fulfilling a desire to maintain contact with nature. The honey bee continues to roam Virginia cities, farms and mountaintops in search of nectar and pollen, while assisting the plants they visit in producing more trees, shrubs, wildflowers and fruit.

“What did I do in WW2? I played the background music.”



DON HOPKINS, North Carolina bee inspector, sent this rare picture of his father, **Irving Hopkins** (*left*), playing organ in the field immediately before the troops marched into the Dec. 1944 Battle of the Bulge. Irving, a chaplain's assistant, has an audience of troops on their way to join

the largest and bloodiest single battle fought by the U.S. in WW2, and the third-deadliest campaign (19,000 killed) in U.S. history. The ultimate defeat of the German army in this month-long encounter put the Germans into retreat for the rest of the European war.



Nancy Ruppert, who has recently retired.



Commercial beekeepers largely elsewhere during Dec. tornadoes

The tornadoes of Dec. 10, 2021 cut a destructive swath across the Midwest, killing 88 people across seven states, and 74 in Kentucky alone, most in the far-western city of Mayfield. **Nancy Ruppert**, North Carolina apiary inspector, reached out to offer assistance with tornado-

related damages to beehives, but found commercial beekeepers had dodged the punch. Most commercial beekeepers in the storms' path had moved their hives to Mississippi and Florida by the end of November, her investigation found.

Chicago souvenir

This scenic study of Indiana chief apiary inspector **KATHLEEN PROUGH** visiting Chicago was taken by Kentucky state apiarist **Tammy Potter**. Kathleen tells AIA members they can reach her by cell phone at (317) 412-3315. "I will have this number for a couple of years, so beekeepers can contact me with questions," she said. Her emails are kathleen.prough@yahoo.com, or kmpro61mich0@gmail.com. Kathleen is an important contributor to the success of AIA, serving on numerous committees. See this year's committee list on the next page and determine where you can make your contribution to AIA's success this year.



AIA 2021 financial report

AIA ended the year with a balance of **\$26,982.58**, reports Treasurer **Keith Tignor**.

Income during fiscal year 2021 consisted of **\$6,340.00** in membership dues and **\$560.00** in meeting registration fees.

Expenses for the year included the Zoom video conference plan, website, this newsletter, hats, the AAPA student award, and other sundry expenditures totaling **\$3,769.42**. The year ended with a net gain of **\$3,130.58**.

Membership in 2021 totaled 38 regular members and 50 associate members.

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