BeeLines

State Apiarist Tammy Potter, Ph.D. • Kentucky Department of Agriculture, Ryan F. Quarles, Commissioner

November 2017

SAVE NOV. 15
Pollinator Plan stakeholders meeting
(see page 2)

Hopkinsville welcomes Nov. 4 KSBA fall conference

Friday, Nov. 3: KSBA Board Meeting, 6 p.m. CDT, Comfort Suites.
2018 KSBA budget, new officers and 2018 speaking calendar to be discussed. Associations, please send representatives.

Saturday, Nov. 4: KSBA Fall Meeting.
Christian County Cooperative Extension office, 2850 Pembroke Road. Free to members.

Remember to enter the **Black Jar Contest.** Bring a sample of your honey (baby jar or two-ounce jar is fine) in a jar painted black, with no identifying markings.

Agenda

8-9 a.m.	Registration.
9-9:30 a.m.	Welcome by KSBA President Rick Sutton.
9:30-10 a.m.	KDA Pollinator Protection software program demonstration by Dr. Tammy Potter. *(Story, page 6.)*
10-11 a.m.	**Dr. Jen O'Keefe,** "Honey typing: How does it work, and what are our bees eating?"
11 a.m.-Noon	KSBA honey discussion, led by KSBA President Rick Sutton.
Noon- 1:30 p.m.	Lunch.
1:30-2 p.m.	**David Knopf,** Regional Director, National Agricultural Statistics Service, discussing the 2017 Census of Agriculture.
2-3 p.m.	Budget approval, officer elections, 2018 meetings schedule.
3 p.m.	Door prizes and adjournment.

Donate a bee book in Hopkinsville to honor Jim Hazelrigg

By Steve Buchweitz, President, Pennyrile Beekeepers Association

Jim Hazelrigg was KSBA's 2016 Beekeeper of the Year.

We hope all KSBA members and anyone interested in Kentucky beekeeping will join us here in western Kentucky Saturday, Nov. 4 for the final KSBA meeting of the year.

Jim Hazelrigg was a member of the Pennyrile Beekeepers Association for many years, until he passed away last January.

To honor Jim's memory and his love for reading, our club is creating a library for its members.

If you would like to contribute to the **Jim Hazelrigg Memorial Library,** please bring donations to the KSBA fall meeting. We will gladly accept new or used books pertaining to beekeeping.

Hope to see you in November!

Steve Buchweitz.

From hive to table – as you watch!

This angled stainless-steel holder lets honey drip directly from the hive frame to the breakfast buffet. Sue Van Patten photographed this innovation in northern Italy's Lake District.

Save the date!

Pollinator stakeholders to plan strategies at Nov. 15 meeting

Many key players in the effort to assist Kentucky's pollinators will brief the group on their progress last year and plans for the coming year, working on joint strategies and timelines in a meeting **Wednesday, Nov. 15.**

The pollinator stakeholders will get together in Room C105 of the Kentucky Department of Transportation (KDT) office, 200 Mero Street, Frankfort, from 9:30 a.m.-3:30 p.m. EST.

PUMPKIN-SPICED HONEY BEE: Grains of pumpkin pollen cling to a worker bee as she makes her rounds. (Macro photography © 2007, by John Kimbler.)

The group will report on the different but allied aspects of their shared mission to improve pollinator habitat in Kentucky. The aim is for the group to coordinate their resources and efforts most efficiently toward their common goal, said Kentucky State Apiarist **Tammy Potter.** The group has been strategizing and meeting on different aspects of pollinator protection before now, Potter said, and this joint effort will allow for further coordination of plans and objectives.

At the meeting:

- **David Waldner,** director of the Division of Environmental Analysis for the Kentucky Transportation Cabinet (KTC), will review the Cabinet's pollinator-promotion initiatives. KTC recently expanded its focus to include bees, after having begun efforts to increase the number of monarch butterfly waystations.

- **Potter** will show the progress made by the Kentucky Department of Agriculture (KDA) in reducing hive mortality, increasing pollinator habitat, and advancing education regarding pollinators. She and KDA's **Vikranth Bangaru** will demonstrate a newly released KDA software program that notifies beekeepers of upcoming pesticide applications. In the program, beekeepers map the location of their hives so they will receive relevant automatic advance email notifications. *(See story, page 6.)*

- Kentucky Department of Fish and Wildlife Resources biologist **Cody Rhoden** will discuss the work of National Resource Conservation Service (NRCS) state biologist **Casey Shrader**, who is assisted by Rhoden and biologist **John Morgan,** in efforts to increase acreage of pollinator habitat and to develop public education. Rhoden will also invite the meeting's attendees to next summer's field event, "Life After CREP" (Conservation Reserve Enhancement Program). The experts at that event will advise former CREP contractors on recommended next steps as the Farm Service Agency's CREP program ends. The program provided funds to help preserve habitats for bees, other pollinators, and a range of other wildlife.

- **Sunni Carr,** wildlife program coordinator for the Wildlife Division of the Kentucky Tourism, Arts and Heritage Cabinet, will report on her program's efforts toward monarch butterfly conservation. Her program aims to increase the number of stems of milkweed, increase the number of monarch waystations, and engage citizen scientists in a voluntary effort to count monarchs.

- The Columbia Natural Gas team — **Susan Murray** (database administrator), **Tony Tipton** (director of land services), and **Mike Honaker** (land agent and safety coordinator) — will conclude the day's programs with an invitation to the **Pollinator Week Celebration, June 18, 2018,** at their Lexington headquarters.

Bell County association recruits public at community festival booth

Patti Loveless, secretary of the Bell County Backyard Beekeepers, staffs the association's booth at the Cumberland Mountain Fall Festival in Middlesboro. The group encouraged visitors to "see the Queen in residence" in the observation hive, and pointed prospective new beekeepers toward a November meeting to learn startup skills. Kentucky State Apiarist Tammy Potter will attend the association's meeting Nov. 13. (Photo provided)

Bell County association generating community buzz

The **Bell County Backyard Beekeepers** are educating community youth on bees, hoping to inspire young people to make the commitment to beekeeping, said association secretary **Patti Loveless.**

At the recent Cumberland Mountain Fall Festival in Middlesboro, the club displayed an observation hive, beekeeping tools, and equipment. They encouraged young prospective beekeepers to attend their Nov. 13 meeting for startup information.

The association offers a hive grant to a deserving new youth beekeeper, Loveless said, with a fully equipped hive, bees, and a year of mentoring.

Loveless reports the Bell County association has doubled in size since last March and has purchased an extractor for the county.

The assocaition meets on second Mondays at 6 p.m., February through November, at the Bell County bus garage at 10236 U. S. Highway 25-E. Yearly dues are $10.

Deadlines near to apply for two FSA risk-management programs

Honey producers should be aware of approaching mid-November deadlines to apply for two risk-management insurance programs designed to guard beekeepers against possible financial losses during 2018, said **Lindsey New,** county executive director of the United States Department of Agriculture's **Farm Service Agency (FSA)** Somerset regional office.

FSA is signing up producers through **Nov. 20** for yield protection against 2018 natural disasters through the **Noninsurable Crop Disaster Assistance Program (NAP** for short).

"NAP is like crop insurance for honey yield," New said. It is designed to reduce financial losses when eligible natural disasters cause a loss of honey production. Optional coverage levels are 50 percent or 65 percent of losses.

Also, the enrollment period ends **Nov. 15** for USDA's **Apiculture Pilot Insurance (API) Program** policies for 2018, administered by the USDA Risk Management Agency and sold by crop insurance specialist agents.

API protects beekeepers' primary income sources — honey, pollen collection, wax, and breeding stock — against losses from lack of precipitation. At the USDA website below, you may locate a crop insurance agent to assist in selecting the proper details of your coverage.

To be eligible for FSA programs, Kentucky beekeepers must annually report their number of honey bee colonies to their local FSA office on form **FSA-578.** Report by **Jan. 2** if you enrolled in NAP for the current year, or by **July 15** if you were not enrolled in NAP. Reports must also be made within 30 days of the date colonies of bees are acquired, brought into, or removed from the county.

Find your local FSA office: offices.usda.gov.
Locate a crop insurance agent: www.rma.usda.gov/tools/agent.html

Fact sheet for the Apiculture Pilot Insurance (API) Program: rma.usda.gov/pubs/rme/apiculture.pdf

Lindsey New, executive director, FSA Somerset Service Center, 45 Eagle Creek Drive, Ste. 101, Somerset, KY 42503. (606) 678-4842, Ext. 125. Fax: (855) 784-0872.

Beekeepers asked also to make reports of Oct. 1 status to KDA

To participate in the voluntary reporting program being conducted by the Kentucky Department of Agriculture (KDA), please file a report including the beekeeper's name, county, pounds of honey produced by Oct. 1, 2017, status, and total colonies as of Oct. 1. *Status definitions:* Hobbyist, 1-29 hives; Sideliner, 30-99 hives; Commercial, over 100 hives.

Please email, fax, or mail this information to:

Tammy Potter, State Apiarist
Kentucky Department of Agriculture
109 Corporate Drive, Frankfort, KY 40601
(502) 229-2950 (work cell) • (502) 564-7852 (fax)
Email: tammy.potter@ky.gov

Varroa is a threat; Nosema, chemicals less so

By Tammy Potter, Ph.D., Kentucky State Apiarist

Prior to the 2015 **Honey Bee Health Survey**, Kentucky had not been included in any such national information-gathering effort.

Varroa. The 2016 results, below, continue a pattern found in the 2015 samples: Once the fall season arrives, Kentucky hives have very high Varroa mite counts. These are unacceptably high counts, in my opinion, because beekeepers should be doing more samples on their own.

Although the United States Department of Agriculture (USDA) assessed for eight viruses, another virus titer (VDV, Varroa Destructor Virus) was found in the middle of the 2016 sampling year (2016), so analysis of the 24 samples has not been finalized.

Chemicals. A big question for beekeepers concerns the impact of agricultural chemicals inside hives and how such additives may impact nutrition. Pollen samples from 10 hives were taken and analyzed in the 2016 sample season.

The results were a mixed bag. Three out of the 10 pollen samples showed no trace of any chemicals in the pollen. One sample had just one agricultural chemical. One pollen sample (taken from a commercial beekeeper) had as many as five chemicals, though the majority were only trace amounts. Six of the 10 samples had trace amounts of 2,4 Dimethylphenal formamide. One sample had trace amounts of Coumaphos, and three of the 10 samples had significant amounts of Thymol (beekeeper-applied miticides).

Nosema. To date, the past two years' worth of data indicate that Kentucky apiaries are **not** dying from Nosema in large numbers. None of the apiaries sampled from thus far have excessively high Nosema counts. This is good news and a real "take-home" from the survey.

Effect. These USDA reports, along with voluntary hive counts and honey reports, have enabled the Kentucky State Apiarist to tailor education and extension to Varroa mite sampling and monitoring programs.

Dr. Potter sampled 24 hives all across Kentucky for this study. The grant funding continues Dr. Potter's sampling efforts through 2017, and funding is being sought for 2018.

KY Samples	Sample size	# mites found	Mites per 100 bees	Mite Levels Exceed Threshold	Nosema Present	Nosema Exceeds Threshold	SBPV Present	ABPV Present	IAPV Present	DWV Present	LSV-2 Present	CBPV Present	VDV
KY-01-2016	1220	5	0.41	-	-	-	-	Yes	Yes	Yes	Yes	-	-
KY-02-2016	2276	28	1.23	-	Yes	-	-	Yes	-	Yes	Yes	-	Yes
KY-03-2016	1063	26	2.44	-	-	-	-	-	-	Yes	-	-	-
KY-04-2016	1035	4	0.39	-	-	-	-	-	-	-	-	-	-
KY-05-2016	1162	27	2.32	-	-	-	-	-	-	Yes	-	Yes	-
KY-06-2016	1451	86	5.90	Yes	-	-	-	-	-	Yes	-	-	-
KY-07-2015	1232	43	3.50	Yes	Yes	-	-	Yes	-	Yes	Yes	-	-
KY-08-2016	1221	83	6.80	Yes	Yes	-	-	Yes	-	Yes	-	-	-
KY-09-2016	1143	124	10.80	Yes	-	-	-	Yes	-	Yes	-	-	Yes
KY-10-2016	1081	91	8.42	Yes	-	-	-	Yes	-	Yes	-	-	-
KY-11-2016	1190	27	2.27	-	-	-	-	-	-	Yes	-	-	Yes
KY-12-2016	1209	37	3.06	Yes	-	-	-	Yes	-	Yes	Yes	-	-
KY-13-2016	1238	1	0.08	-	-	-	-	-	Yes	Yes	Yes	-	-
KY-14-2016	1075	7	0.65	-	-	-	-	-	-	Yes	Yes	-	-
KY-15-2016	1233	0	0.00	-	Yes	-	-	-	Yes	Yes	Yes	Yes	-
KY-16-2016	963	49	5.10	Yes	-	-	-	-	-	Yes	Yes	-	-
KY-17-2016	1161	10	0.90	-	-	-	-	-	-	-	Yes	-	-
KY-18-2016	799	3	0.38	-	-	-	-	-	-	Yes	-	-	-
KY-19-2016	935	13	1.40	-	-	-	-	-	-	-	Yes	-	-
KY-20-2016	1015	21	2.07	-	-	-	-	Yes	-	Yes	-	-	-
KY-21-2016	866	18	2.10	-	Yes	-	-	-	-	Yes	Yes	-	-
KY-22-2016	822	8	0.97	-	-	-	-	-	Yes	Yes	Yes	-	Yes
KY-23-2016	837	6	0.70	-	-	-	-	-	-	-	Yes	-	-
KY-24-2016	879	11	1.30	-	-	-	-	-	-	Yes	-	-	-
		Totals:	23	7	5	0	0	8	4	20	13	2	4
		Percent:	96%	29%	21%	0%	0%	33%	17%	83%	54%	8%	17%
			Mites Present	High Miteload	Nosema Present	High Nosema	Slow Bee Paralysis	Acute Bee Paralysis	Israeli Acute Paralysis	Deformed Wing Virus	Lake Sinai Virus	Chronic Bee Paralysis	Varroa Destructor Virus

Virus report, next page

Relative presence of nine bee viruses in Kentucky

- **ABPV - Acute Bee Paralysis Virus.** Rare. Has been associated with colony losses.
- **BQCV N/A - Black Queen Cell Virus.** Very common, may be associated with Nosema disease.
- **CBPV- Chronic Bee Paralysis Virus.** Rare in U.S.
- **DWV - Deformed Wing Virus** *(pictured)***.** Very common. Associated with Varroa mites.
- **IAPV - Israeli Acute Paralysis Virus.** Common in some regions. Associated with colony losses.

Deformed Wing Virus, very common, associated with Varroa mites. Photo © David J. Evans, theapiarist.org.

- **KBV - Kashmir Bee Virus.** Uncommon. Has been associated with colony losses.
- **SBPV N/A - Slow Paralysis Virus.** Not known to be in the U.S.
- **LSV-2- Lake Sinai Virus-2.** Newly discovered. Found at high levels in some bees, and in the same family as CBPV.
- **VDV - Varroa Destructor Virus.** Newly emerged in the 2016 sampling.

— Molecular report, USDA-APHIS Kentucky 2016 Honey Bee Health Survey, Dr. Tammy Potter.

State Apiarist's report

Bee Maintenance: This time of year, you want to eliminate unnecessary moisture in the hive. Here is **Ann Harman's** candy recipe, which creates a supplemental sugar source without heating the mixture. Mix **10 pounds** of white granulated sugar in **one cup** of water. (Quantities are correct, it can be done.) Do not use powdered sugar; it contains cornstarch, which does not agree with the bees. Shape into slabs on wax paper, allow to harden, and place inside the hive.

* * *

Now is the time to consider using **oxalic acid,** either the dribble method or the vaporizer method. A video from the Honey Bee Health Coalition, "Using Oxalic Acid," demonstrates safe methods of application.

youtube.com/watch?v=Sp-9eD3Sgww

State Apiarist's schedule

- **Nov. 2: Eastern Kentucky University,** Richmond.
- **Nov. 3-4: KSBA meetings**, Hopkinsville.
- **Nov. 6-7: Kentucky Women in Agriculture** conference, Lexington.
- **Nov. 9: Buffalo Trace B.A.,** Maysville, 7 p.m. EST.
- **Nov. 13: Bell County B.A.,** Middlesboro, 6 p.m. EST *(see page 3)*.
- **Nov. 27: Suds and Science,** West Sixth Brewery, Lexington, 7 p.m. EST.

Honey Sweet Cornbread

1/2 cup cornmeal
1-1/2 cups flour
2/3 cup sugar
1 T. baking powder
1/2 t. salt
1/3 cup canola oil
3 T. butter, melted
1/4 cup honey
2 eggs, beaten
1-1/4 cups milk

In a large bowl, combine cornmeal, flour, sugar, baking powder and salt. Add oil, melted butter, honey, eggs and milk. Stir to combine. Pour batter into a greased 8-inch-square baking pan. Bake at 350 degrees for 35 minutes. Yield: One 8-inch-square pan.

— EllenAnn Meier, Lexington

State Fair Blue Ribbon Winners

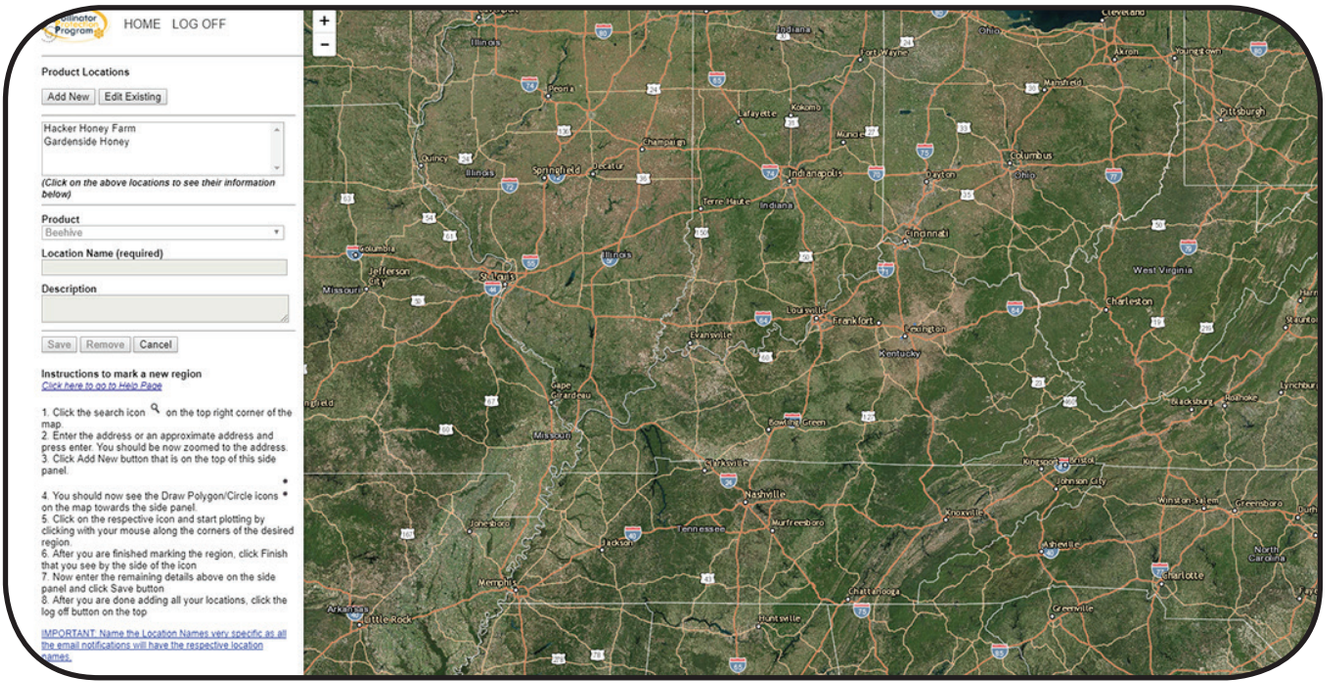
Honey Pecan Pie

1/2 cup honey
1/2 cup corn syrup
1/2 cup brown sugar
3 T. melted butter
3 eggs
1/2 t. salt
1 cup pecans

Pie crust:
1 cup flour
1/2 t. salt
7 T. butter
3-4 T. ice water
I T. honey
1/2 t. vinegar

Combine flour and salt. Cut in butter. Mix together water, honey and vinegar. Add to flour mixture, one T. at a time until dough forms a ball. Roll out and place in pie pan. Crimp edges. Distribute pecans on bottom of pie shell. Combine other ingredients and pour over pecans. Bake at 425 degrees for about 1 hour.

— Lynn Rupley, Louisville



Once you mark your hive location(s) on the computerized map, whenever a pesticide applicator logs in with intended spraying in that area, the program will generate an email to you as below, notifying you of the proposed activity.

----- Original Message -----

From: Kentucky Department of Agriculture
Sent: Wednesday, October 4, 2017 2:12 PM
To: *[Beekeeper's name]*
Subject: Pesticide Application on 10/7/2017 at 8:30 AM within a five-mile vicinity of your hives

Dear Beekeeper,

There will be a pesticide application on 10/7/2017 at 8:30 a.m., in which the label requires notification to beekeepers within a five-mile vicinity of an area you selected in the KDA Pollinator Protection Program. Your hives fall within this area. Please take appropriate measures to protect your hives. In addition, please be aware of local weather patterns during this time frame.

The following are the hives that are within a five-mile vicinity of the Pesticide Application:

Corporate Apiary

Thank you for your participation in this program.

Kentucky Department of Agriculture

Pollinator Protection software warns of spraying near hives

The Kentucky Department of Agriculture is rolling out its Pollinator Protection software that tracks beekeepers' hive locations, stores the required time intervals for pesticide applicators to warn of upcoming applications, and automatically notifies beekeepers to take precautions regarding the upcoming spraying, if the pesticide's label requires notification.

Beekeepers download the software and list the location of their hive(s) by drawing a polygon on a map. Nearby pesticide applications trigger the email to beekeepers. If the label requires notification to beekeepers, the program assists in that effort. The program is free, voluntary, and anonymous; all your beekeeping information is private to you.

The information for the applicator is displayed once he/she enters the details of the application. The applicator enters the chemicals and the proposed date and time of spraying. The software locates any affected hives and automatically sends notification emails to the beekeepers.

It is important to name your hive distinctively, especially with multiple hives in the system; the email program will use the name for your hive that you give it when you sign up ("Corporate Apiary," in the example email at left).

To join this notification system, register at **www.kyagr-apps.com/Pollinator/Home/Index.** A svideo on that site takes you through the registration steps, showing you how to mark your hive area on the computer map.

The how and why of pollen analysis

Honey analysis: The unfiltered truth

By Vaughn M. Bryant, Ph.D.

Filtering honey has become a big issue among many individual beekeepers. Many beekeepers want to remove large items of debris such as insect parts and pieces of wax from the honey they produce so that their products appear clear in the jars of honey they sell.

Most agree that clear honey is what will appeal most to customers. Occasionally, a customer might want clear honey with a piece of honeycomb included in the jar, but no customer usually will buy honey with insect parts and/or pieces of wax suspended in the jar of honey. This is why almost all beekeepers want to filter their honey.

It's legal, but ...

The Federal Register of the United States Department of Agriculture on standards and grades of honey states that beekeepers may remove "fine particles, pollen grains, air bubbles, or other materials normally found in suspension."

Dr. Bryant is one of the nation's leading palynologists.

Therefore, federal law says filtering honey and removing everything suspended in it, including pollen, is legal. But removing pollen along with other suspended items can create a significant problem for testing and will also lower the nutritional value of the honey.

Many didn't measure up

In a study I conducted in 2011 with Andrew Schneider of *Food Safety News,* we discovered that more than three-fourths of the 60 honey jars we purchased in grocery and drug stores from 10 states and the District of Columbia were incorrectly labeled.

We tested all of them and found that, in spite of labels saying "raw and unfiltered," many had no pollen in them. Thus, they were not "raw and unfiltered."

In addition, many of those jars of honey claimed they were "local wildflower honey, buckwheat honey, tupelo, sourwood, sage, orange blossom, clover, wildflower, or organic honey from various places in South America." However, our examination showed that 76 percent of the

See **ANALYSIS,** *page 8*

Dr. Bryant holds the American Association of Stratigraphic Palynologists (AASP) AASP Medal for Scientific Excellence, recognizing his outstanding years of teaching, scientific research, and service. His article is reprinted with permission of the author and Bee Culture *magazine, where it initially appeared.*

Dr. Jen O'Keefe accepting honey samples for analysis

Jen O'Keefe, Ph.D., is accepting up to eight unfiltered honey samples per month for analysis. The charge is **$80** per sample for the analysis and report. Please allow one month for a response.

Dr. Jen O'Keefe.

Dr. O'Keefe will address the Kentucky State Beekeepers Association fall meeting Nov. 4 on "Honey typing: How does it work, and what are our bees eating?"

Ship samples to Dr. O'Keefe at 404-A Lappin Hall, Earth and Space Sciences Dept., Morehead State University, Morehead, KY 40351.

ANALYSIS *... from page 7*

Mis-labeled honey is what "customers like to buy"?

samples we purchased and tested did not match what was claimed on the jar because they had no pollen we use to verify the nectar sources and origin of honey.

Most of the samples that contained pollen and had labels that stated the honey type did not contain the nectar sources stated, or did not reflect the stated origin of the honey.

They don't want to know

When many of the large honey packaging companies were asked about their honey, most either did not discuss the topic or said most of the honey they purchase already has pollen removed.

We asked some why they labeled the honey as being a special type. They sometimes said the seller told them what it was when they bought the honey, so they put it on the label.

One honey seller admitted that he didn't know what the honey was that he was selling, but said he labeled it clover, wildflower, sage, or local honey because that is what the "customers like to buy"! By doing that, of course, neither the packaging companies nor the consumers are assured of where the honey is from, or what is in the honey.

Because of the role pollen analyses play in identifying honey and in honey bee research, pollen needs to remain in honey to verify the product's accuracy for place of origin and nectar sources as well as retaining the full nutritional value.

For individual beekeepers or honey producers sincerely concerned about the honey products they sell and who want to ensure that their customers purchase honey based on what is on the label, filtering honey becomes a big issue.

Common errors

Beekeepers frequently send me honey to be examined and then are shocked to find that most or all of the pollen in their honey has been removed. These beekeepers have carefully filtered their honey using many techniques, and then are amazed to discover their techniques did not allow pollen to remain in the filtered product.

Many use a variety of techniques, and continue to ask which filtering technique is best. These beekeepers and commercial honey producers want to do the right thing but do not know how to filter honey correctly to save the pollen.

See **ANALYSIS,** *page 9*

Darrell Hester, a member of the Nelson County B.A., has hives at Bernheim Research Forest near Clermont (so he can be reasonably sure his pride in local honey is justified). Here he is set up for sales at Bernheim's recent Bugfest event. We congratulate Darrell on his Sweepstakes win this year at the Kentucky State Fair. (Photo by Tammy Potter)

ANALYSIS *... from page 8*

Prepare your sample correctly for a reliable, accurate report

Other times, people accidentally rupture the pollen storage cells in a frame, and those pollen grains get added to the honey being extracted. That will also ruin an accurate analysis of honey based on pollen content because all that extra pollen from storage cells will skew the results.

Nectar *vs.* pollen gathering

Often we find honey bees will collect nectar from certain floral sources but will collect pollen from other sources they visit only for pollen, not nectar. I have examined some honey samples containing over 900,000 pollen grains per 10 grams of honey, far too high for most honey types.

The normal and expected range of pollen in most U. S. honey types should range from less than 5,000 to just over 100,000 pollen grains per 10 grams of honey, depending on the floral sources. There are only a very few honey types worldwide in which a "normal and expected" amount of pollen would range from 700,000 to over 1 million pollen grains per 10 grams of honey. One of those is Manuka honey from New Zealand, and a few others.

Send 35 grams

As far as filtering, I always suggest "no filtering" is the best for accurate understanding of nectar types in honey.

I also recommend cutting out a small area of the comb that is all honey and does not contain any nearby pollen storage cells. Then you only have to squeeze the honey comb into a container. Even if some wax gets included, that will not hurt our ability to conduct a pollen analysis.

Remember, all we need to do an accurate test of nectar types is just 10 grams of honey. However, we recommend you send at least one ounce (about 35 grams) in case we drop a test tube, or spill some of the contents of our beakers in processing the honey.

Because of the role pollen analyses play in honey and honey research, it is essential that pollen recovery techniques produce accurate and repeatable results. The process we use to extract pollen for analysis from honey is not complicated, and it can be done fairly easily by the right kind of equipment in the right type of laboratory.

What filters can I use?

So, if some filtering techniques are bad, then what is a good way to filter honey? We have tested to find if various layers of cheesecloth, or an assortment of plastic and wire screens, were trapping pollen. We examined

See **ANALYSIS,** *page 10*

The importance of honey typing

We often see clover honey or wildflower honey on a label, and we wonder, "How do they know the bees mostly visited clover?"

Honey can vary depending on what pollen is being brought back to the hive and the time of year the honey is harvested. Typing honey is the only way to know definitively what flowers the bees are visiting most. It can also be determined whether the bees are "dumpster divers," consuming mostly corn syrup from leftover sodas.

***Melissopalynology* is the study of pollen in honey. To examine pollen in honey requires training in botany with emphasis on identifying plants and pollen spores, along with an understanding of entomology emphasizing honey bee ecology.**

To be sold internationally, honey has to be typed according to international laws. There are only two or three laboratories in the U.S. typing honey, so it is almost unique that Morehead State University has Jen O'Keefe, Ph.D., assistant professor of science education in the Department of Earth and Space Science.

Some might wonder what difference it makes to know the source; honey is honey, right? No. Some honey might not be the sweet goodness you had hoped for. As I mentioned, it could be mostly corn syrup from bees that have been "dumpster diving." Or, worse: Dr. O'Keefe once sampled honey with mostly poison ivy pollen, and actually suffered an allergic reaction when she tasted the batch! Honey with a large amount of rhododendron pollen can also have a toxic effect on humans.

Dr. O'Keefe and other members of the Earthwise Eagles Bee Campus USA committee believe it is a worthwhile endeavor to offer a honey typing service in our region and to involve students in the departments of agriculture and biology.

Morehead State University is a Certified Bee-Friendly Campus. This item from the website of Earthwise Eagles of MSU references Dr. O'Keefe's February 2016 presentation to the Kentucky Northeastern Beekeeping School.

Illustration: Pollen grains under an electron microscope. Photo pinterest.com/caftychell/magnificent-microscopy and ferrebeekeeper.wordpress.com/2010/04/26.

ANALYSIS *... from page 9*

Filters that don't work, and the ideal one I recommend

what was trapped on top of the screens to learn if those trapped particles of debris, wax, and insect parts were also trapping pollen themselves. We found that several layers of cheesecloth will trap wax and other debris, and some pollen grains will get stuck behind the debris and wax and between layers of cheesecloth, usually discarded after filtering.

The same problem occurred and pollen loss did happen with a variety of screen types, many of which are sold commercially by bee equipment suppliers. The commercially available "200-micron filter" in theory should not trap pollen, because most pollen grains are 120-150 microns or smaller; but the 200-micron filter becomes clogged with wax and debris, which in turn traps pollen.

Another serious problem: Of the trapped pollen we found, most were large pollen grains. Therefore, removing many of one type of pollen yields a false report of the original contents of the honey.

My recommendation

The best way to filter and not lose pollen is to filter honey through regular window screen material because it catches most wax, bug parts, and other debris. Use the steel type, not the plastic type, with quarter-inch openings, available at any hardware store.

Put the window screen over a bucket and tie it down tightly with an old bicycle inner tube or with bungee cords, to make an ideal strainer. Watch carefully and make sure the screen surface is not getting too clogged with debris or wax. If the screen begins to clog, rinse with hot water, and return to screening.

I also recommend that you heat the honey slightly beforehand, or it will be too viscous to pass through the screen easily. Don't over-heat the honey, but some heating will help when you screen it.

Some beekeepers filter honey through a regular kitchen colander such as one might use to wash lettuce, fruits, or berries. Most colanders have openings big enough to not trap pollen, but most are cup-shaped, and all the debris and wax goes to the bottom of the colander and there traps pollen.

Correct collection important

Extracting pollen from honey is easy, but it is time-consuming and requires skill to do correctly. However, if the beekeeper did not collect the honey correctly from the hives, and if it was not filtered correctly, then sending the honey sample off for analysis of the nectar sources may not produce accurate results.

As we mentioned earlier, probably the best method is to cut out a piece of the honey comb, squeeze the liquid into a jar, and send it off for analysis. Don't worry if some wax gets included; we can remove it during the extraction process.

If beekeepers will follow these instructions, the analysis results should excellently reflect nectar sources in their honey.

Exercise your instinctive sense of direction!

Govin's Farm in Menomonie, Wisconsin, honored pollinators in their 11-acre corn maze, declaring "Bees Feed the World."

Govin's is directly aware of honey bees' importance as pollinators. The farm rents bees from a local honey producer to pollinate the vines in their three-acre pumpkin patch.

Photo by permission of Govin's Meats and Berries, govinsfarm.com.