



# CENTRAL COAST BEEKEEPERS NEWSLETTER

March 2020

ISSUE NUMBER 47

NEXT MEETING APRIL 1, 2020

**REMINDER: The March meeting will be delayed until April 1<sup>st</sup> and, as usual, will be held at the Newport Library. The early session, led by club members Stan Scotton and Jon Sumpter, Beekeepers in the Oregon Master Beekeeper Program, will begin at 6 pm and will focus on what you need to get started if you are getting bees this year including: equipment/tools/protective gear, setting up your apiary, and installation of nucs and packages. At 7:15 pm club member Max Kuhn, a Journey Beekeeper who is working on his Master Beekeeper certification in the Oregon Master Beekeeper Program, will cover splits – how and why to make them.**

It looks like spring will arrive early this year, as you can tell from all the buds popping out on trees and shrubs. On the nice warm and sunny days we have been having between bouts of rain, I hope that you have seen your bees out foraging for pollen and nectar. It is definitely time to heft your hive(s) to be sure that they have enough stores to keep them going through the last vestiges of winter and to check for mites and treat as necessary to give them a good start as they begin to build up for the nectar flow.

I hope that those of you who are beginning your beekeeping journey this year will attend the early session on April 1<sup>st</sup>. Getting off on the right foot will make a big difference on your initial experience and will motivate you for the future. If you have ordered bees through the club, we should be hearing soon about the delivery dates for nucs and packages and will be getting in touch shortly to arrange delivery.

Also, anyone hoping to expand their apiary through splits will get a chance to hear about some effective ways to accomplish this during our second session. This, along with swarm collection which we will be exploring at the May 27<sup>th</sup> meeting, is one of the most cost-effective ways to increase the size of your apiary. As hives begin to build up for the coming nectar flow, it is not uncommon for them to begin thinking about swarming and to start to grow new queens. Splitting will allow you to take advantage of these new queens without losing your hive to swarming.

Take a look at the ANNOUNCEMENTS section of the newsletter for some very interesting educational opportunities coming up this year and mark your calendar to include participation in at least the Oregon State Beekeepers Conference on October 23<sup>rd</sup>-25<sup>th</sup> which will once again be in our backyard in Florence.

Becca Fain

Club President

**ANNOUNCEMENTS !!!!** – look for \* at locations where we will be having a club booth.

**\*April 25<sup>th</sup>**

Earth Day Celebration at the marina in Florence

**\*May 10<sup>th</sup>**

Oregon Coast Honey Lovers Festival – Yachats

**\*May 16<sup>th</sup>**

Lincoln County Master Gardeners Plant Sale – Newport Fair Grounds – 9am to 2pm

**\*July 3<sup>rd</sup>-5<sup>th</sup>**

Lincoln County Fair at the Newport Fair Grounds

**July 9<sup>th</sup> – 11<sup>th</sup>**

The Western Apiculture Society spans the States west of the Mississippi, Alaska, Canada and Mexico. Each year a beekeeping conference is held in one of its member states. This year's conference will be in Missoula, Montana and will be held in conjunction with a Technology Field Demonstration Camp and the 4<sup>th</sup> International Hive Monitoring Workshop. For detailed information about the events, speakers and logistics, go to: <https://westernapiculturalsociety.org/the-43rd-annual-was-conference/>

**September 12<sup>th</sup>**

Game Changer Conference – New Avenues in Honey Bee Viruses-Pests-Nutrition in Hood River with Sam Ramsey, Michelle Flenniken and Vanessa Louise Corby-Harris. Registration : [bg-bees.com](http://bg-bees.com)

**October 23<sup>rd</sup>-25<sup>th</sup>**

Oregon State Beekeepers Association 2020 Conference – Florence. More details to come.

## CCBA Booth at the Florence Earth Day

Mark your calendars. The Florence Earth Day celebration is on April 25th on the boardwalk at the port. CCBA will have a booth at the event manned by Britte Kirsch and other members of the CCBA. Stop by if you can, or volunteer to help out. You can respond to this newsletter if you are interested in representing the club at the event.

## More on Asian Hornets

It seems like COVID-19 isn't the only bad thing coming from Asia. The February newsletter included the NY Times article about the discovery of a Giant Asian Hornet in Washington State last December. The hornet was found in Blaine in Northwestern Washington along the Canadian border. Others were found in late summer in Nanaimo, Vancouver Island, British Columbia including a nest that was dug up and destroyed. This species *Vespa mandarinia* is not the same as the Asian hornet *Vespa velutina*, that is spreading in Europe (introduced into France in 2004 it has subsequently spread to Spain, Portugal, Belgium, Italy, the UK, the Netherlands, Germany, the Channel Islands and the Balearic Islands) nor the European hornet, *Vespa crabro*, a sometimes pest of honey bees along the East coast that has spread to the mid-west.

All three hornets are serious pests of honey bee colonies. They attack the colony entrance or take foraging bees on the wing. They separate the bee thorax from head and abdomen and fly back to their nests with the thoraces.

The Japanese giant hornet apparently leaves a pheromone marker once it locates a beehive entrance. The pheromone attracts nest-mates and the hornets converge on the hive. One description states that an individual hornet can kill forty European honey bees per minute, while a group of 30 hornets can destroy an entire hive containing 30,000 bees in less than four hours. They initially kill, then when resistance is reduced, they dismember the bodies. They will enter unprotected hive entrances and also eat bee brood. Worker bees apparently have little success stinging the hornets. They do seek to ball an individual hornet and suffocate it.

Speaking of robbing mayhem at the colony entrance, Dan Wyns, of BIP Michigan Tech Team (Dan and Ellen were the PNW Tech Team from OSU before Dan moved to Michigan to start a new BIP team) had a great blog on the BeelInformed website about robbing of colonies by bees. He included a spectacular photo (attributed to Ana Heck of Michigan State) . If you have not read the BIP blog by Dan I recommend you do so before the bees get active this season.

If you see something unusual contact OSU. Take photo or capture it and put in baggie in freezer. Ninety-nine times out of a 100 it will not be something serious like a Giant Asian hornet, but just in case let OSU give you that piece of mind. Information on how to identify Asian giant hornet can be found at [agr.wa.gov/hornets](http://agr.wa.gov/hornets).



## Oregon Master Beekeeper Program

Like the recruiting call of WW II, the Oregon Master Beekeeper program (OMB) “Wants You”. We are seeking experienced beekeepers to support the program. Because most start at the Apprentice level, you may think, “This doesn’t apply to me. I’m not a beginner.” Actually this is not the case.

If you have 4 or 5 years of current beekeeping experience, you qualify to Challenge the Apprentice certification. Meeting the challenge brings benefits to you and to the program; you are eligible to enroll at the Journey level and you can mentor new beekeepers.

The Journey level allows you to broaden your knowledge through self-guided learning and educational opportunities. Guided studies are an example. On your own, or working with other students, you select the topics you will pursue; hopefully choosing some that challenge your knowledge; e.g. Honey Bee Dance Language or The Honey Bee Digestive System.

You can also take advantage of educational opportunities. During the annual Journey Lab Day, usually scheduled in May, you will work with a microscope and study bee anatomy in detail. Then in summer, often in June, the OMB Field Day takes place. In addition to educational opportunities this is when Journey Field and Lab exams are scheduled for those ready to take them. The Journey Institute, scheduled the Friday before the annual state conference in late October, offers you the opportunity to hear from one or more of the conference speakers.

Not to be overlooked is mentoring. What makes the Oregon Master Beekeeper program unique is the opportunity for a new beekeeper to work with a mentor 4 times a year to complete field worksheets. It is the availability of mentors in an area that determines the number of students we are able to take. The program always seeks new, qualified mentors. We ask that mentors have a minimum of 3 years beekeeping experience and be certified at the Apprentice level. Meeting the Apprentice challenge meets this requirement.

For more information and to apply to the Challenge, click on the link to the Extension website. <https://extension.oregonstate.edu/mb> Click on “the Apprentice Beekeeper Level” to see the details and to find the application at the bottom of the page. For questions you can send an email to [info@oregonmasterbeekeeper.org](mailto:info@oregonmasterbeekeeper.org) or Rita Ostrofsky at [rita.ostrofsky@oregonstate.edu](mailto:rita.ostrofsky@oregonstate.edu)



Kathy Cope describing the 'how to' of hive inspection

## **If you missed the February meeting...**

In February, we had two great speakers. The first, Kathy Cope, Journey beekeeper in the Oregon Master Beekeeper Program, gave some great information to newer beekeepers about hive inspection (when, why, how to prep for, the use of a diary and the basics of examination). Kathy explained that opening the hive for an inspection is always disruptive to the bees and that having a plan about what you want to accomplish is a good idea. She suggested a good way to start is to get a chair and just watch the activity around the hive. Look for warning signs such as dead bees or larvae, fecal matter, and odd activity.

When you do inspect, make sure that you have protective gear and a smoker, don't have your cell phone on vibrate, and be prepared to take note of what you see. Check each frame for honey, eggs, bees, larvae, drone and queen cells. Take

out each frame and make sure that you put them back into the box in the same order.

Another way to monitor your hives without opening them up is to tip the hive to get an idea of its weight. A heavier hive is probably thriving with plenty of food for the colony.

The second session focused on diseases of the hive presented by Carolyn Breece, Senior Faculty Research Assistant, OSU Honeybee Lab. This session covered various hive diseases, how to detect them and how to prevent/treat them. She did not discuss varroa mites but good information on control can be found at <https://honeybeehealthcoalition.org/>

Carolyn suggested that regular monitoring of your hives is essential. A hive can appear to be thriving and then collapse quickly. Inspections involve monthly mite level checks, looking for red flags such as nasty odors, spotty brood pattern, perforated capping and deformed larvae.

A diagnostic toolkit is essential. It includes items such as nitrile gloves, forceps, toothpicks, diagnostic kits, flashlight, record book and a sample container.

Close monitoring of your hives is essential for happy healthy bees.

## **Ten Years at the Oregon State University Honey Bee Lab**

*Carolyn Breece*

Did you know the OSU Honey Bee Lab has been around since 1919?! You may remember the lab when it was led by Dr. Michael Burgett from 1970 to 2001, or perhaps you were even a student in one of his classes! The long, colorful history of the Honey Bee Lab is a story for another time. Today, we are going to review recent times as we celebrate the 10-year anniversary of the lab under the leadership of Dr. Ramesh Sagili.

When Dr. Burgett retired in 2001, the Honey Bee Lab remained vacant for several years. The economy was down, funding was tight, and honey bees were pushed to the wayside. However, crops still needed pollination, and beekeepers still needed support! The Oregon State Beekeepers Association (OSBA) rallied to reinstate the position. Their efforts and the unfortunate reports of Colony

Collapse Disorder in 2006 finally caused administrative officials to pay attention. At last, the OSU Honey Bee Lab was resurrected in 2009 under the leadership of Dr. Ramesh Sagili, a young honey bee pheromone specialist from Texas A&M University.



Carolyn Breece briefing the club on hive diseases

Ramesh's mission for the OSU Honey Bee Lab was to develop a research and extension program with the number one purpose of serving the needs of Oregon beekeepers. His first days on the job were spent meeting with beekeepers all over the state. He learned the crops their bees pollinated, he learned about beekeepers' challenges, and he asked them how he could help through research and extension.

Two weeks after Ramesh started, he hired an assistant (me!) with a background in forestry, beetles, and birds. Not a likely combination with bees, but boy, do I know how to buy a truck off Craigslist! Ramesh and I drove all over the place in the lab's "new" 2001 Ford Ranger, which we purchased for \$2,500. That truck



almost made it to our 10-year anniversary, but, alas, it crashed into a fence at year 9.

With the little money remaining after our big truck purchase, Ramesh was able to hire some undergrads to help analyze samples of bees that were sent to us from all over the state. The lab was growing!



Clearly not a priority on Ramesh's extensive to-do list, word is that it took the full 10 years to reach bee beard status!

Our favorite projects were those involving Oregon beekeepers. We often coerced commercial beekeepers into letting us sample their bees, trap pollen, and cover their colonies in bright orange tape. They helped us take pains-taking measurements of bees. They offered their advice and friendship all along the way.

And we are certainly grateful for that! In 2011, Ramesh had to interview again for the honey bee research position, and this time it was for good (tenure-track assistant professor!). The OSBA rallied again and for the final time, Ramesh was hired to lead the Honey Bee Lab.

The lab carried on and acquired graduate students, Ellen Topitzhofer, Cameron Jack, and Stephanie Parreira, along with dozens of dedicated, hard-working undergraduate students. By this time, the lab had studied the nutritional quality of major Oregon crops pollinated by honey bees, the importance of protein

supplements in colonies suffering from Nosema, and the effects of commonly used pesticides on honey bee health.



Left to right, Alexis Rist, Ramesh Sagili, Carolyn Breece acknowledge OSU during a research venture in Madras.

We had also teamed up with our best friends (the OSBA) and developed an educational program for new beekeepers: The Oregon Master Beekeeper Program. The Bee Informed Partnership established a tech team at OSU. Ben Sallmann and Ellen Topitzhofer traveled all across the Pacific Northwest sampling honey bees for pests and diseases.

And then came Hannah. Hannah Lucas took the reins as lab manager in 2015, and the lab has never been the same. Chemicals are organized, lab benches are tidy, data are entered and verified, freezer contents are cataloged, safety training is regularly scheduled. Hannah is a powerhouse and it is hard to remember how we got anything done before her arrival.

None of us can forget the images in the news of the Wilsonville bee kill. Dead bumble bees littering the parking lot, trees wrapped up in shade cloth, bee researchers (Ramesh!) on site taking samples. This was a most unfortunate event of misapplied pesticides. However, the silver lining of the story: the Honey Bee Lab got a little extra funding and OSU hired a pollinator health specialist, Andony Melathopoulos! Andony immediately made a huge impact on the awareness and

protection of Oregon's native pollinators. He implemented the wildly successful Oregon Bee Project and the Oregon Bee Atlas. A recent news article stated that Andony's program leads the nation in bee-saving efforts with citizen science and education.

To help Andony in his efforts, he teamed up with Ramesh and together they hired Jen Holt in 2017. Jen coordinates the Oregon Master Beekeeper Program, the Oregon Bee Project, and the Oregon Bee Atlas. Jen, with her incredible organizational skills, has been instrumental in the efficiency, in the effectiveness, and in the gleaming polish of these three bee programs.

On the research front, we welcomed Priya Chakrabarti Basu in 2016, and the lab is now at its zenith. Priya works around the clock investigating different aspects of honey bee physiology, determining crucial components of the honey bee diet, evaluating the quality of forage planted for pollinators, and much more.



The Honey Bee Lab builds Priya's Metropolis on International Women's Day.

In 2019, two new graduate students arrived: Emily Carlson and Ellie Chapkin. We are looking forward to some exciting research from them. It won't be long before we'll be seeing them on stage at a future OSBA conference.

Reflecting on the past is great fun, but what stands out the most over the last decade is the development of a long-lasting friendship with the OSBA. Together, the OSBA and the OSU Honey Bee Lab have collaborated in research projects, developed educational programs, and created an army of outreach warriors. Together, we have celebrated births, mourned deaths, welcomed new pets, shared the joy of good honey years, and lamented over bee losses and Varroa levels. Members have donated funds, equipment, and time. The OSBA has supported Ramesh and the OSU Honey Bee Lab in every step of the way. In return, we hope our work has helped you keep your bees healthy, your businesses thriving, and the honey flowing. We thank the OSBA for a decade of friendship and partnership, and we look forward to another 10!

## **NEWS FROM THE OSU HONEY BEE LAB**

*Ramesh Sagili*

### **Honey Bee Brood Disease Identification -Training for Veterinarians**

We understand that beekeepers are having trouble finding veterinarians who can provide prescription for antibiotics to treat honey bee brood diseases. Veterinarians are reluctant to provide a prescription, as a majority of them do not have knowledge of honey bee diseases. To address this problem, OSU Honey Bee Lab is collaborating with veterinary faculty member Dr. Michelle Kutzler at OSU to train veterinarians on honey bee disease diagnosis so that veterinarians in the state are willing to provide prescriptions for antibiotics when needed by beekeepers. Dr. Kutzler plans to travel around the state and conduct trainings at several veterinary clinics to train interested veterinarians. Please feel free to nominate a veterinary clinic / veterinarian in your area for the free training program. Free food will also be served at these trainings. Please send your nominations directly to either Dr. Kutzler at [Michelle.Kutzler@oregonstate.edu](mailto:Michelle.Kutzler@oregonstate.edu) or to me ([ramesh.sagili@oregonstate.edu](mailto:ramesh.sagili@oregonstate.edu)) or Carolyn Breece ([carolyn.breece@oregonstate.edu](mailto:carolyn.breece@oregonstate.edu)).

## Drone Congregating Areas (DCAs)

by Rick Olson

Looking back at the 2019 OSBA fall conference we heard so many experts in the field. But information sometimes comes in sideways on little cats paws. At the conference you can drop into informal discussions with any of the speakers where topics outside the conference can be talked about. I happened to ask Michael Palmer who had spoken about queen rearing and asked him about drone congregating areas (DCA) a topic of interest to me. He turned me onto "Mating biology of honey bees" by Gudrun & Nikolaus Koeniger, James Ellis and Lawrence Connor. As soon as I got home I ordered it from Amazon and wow what a find.

There are many drone congregation area mysteries. Studying DCAs is difficult as mating takes place high in the air and far from the colony. Where are DCAs located? How do queens and drones decide to meet? Another puzzling mystery is how do drones assemble in the same DCAs year after year when drones of one year do not survive into the next. What goes on in a DCA stays in the DCA.

Understanding the breeding process of honeybees will help us develop a diverse genetic stock that is productive, disease and pathogen resistant, gentle in disposition, with good brood viability and adapted to our harsh environment here in Oregon. Much research is still to be done.

Colonies begin to raise drones about two weeks before queens to ensure that mature drones are available at the same time that virgin queens are ready to mate. The number of drones in a colony is regulated by the workers with some control by the queen. During the mating season about 15% of the colony consists of drones.

When drones are about 2 weeks old they begin their mating flights which last about 25 minutes. They generally begin these flights in the early afternoon when the temp is above 64 deg F. At 1:00 pm drones begin flying and by 2:00 pm hundreds of drones will be leaving the colony to begin congregating in a DCA at an altitude of about 33-82 feet where there may be thousands of drones from many different colonies.

Drones locate a DCA using the structure of mountains and valleys. Studies indicate that as drones leave the colony they fly above their apiary and then towards depletions in the horizon (areas where the elevation of the horizon is lower). These depletion areas have the greatest light intensity on the horizon.

Drones congregate where these areas open up and there is more even light distribution. In flat terrain drones tend to be evenly distributed around their apiaries.

Queens tend to fly to DCAs farther from the colony than the drones. This helps avoid inbreeding and allows the drones to spend more time in a DCA looking for a queen to mate with. A queen may fly about 2 miles looking for a DCA. A drone will typically choose a DCA .6 to 1.2 miles from his colony.

Queens do not fly until the temp is about 68F. Warm days with blue or partly cloudy skies offer optimal mating conditions. The queen begins her flight 30-60 minutes after the drones. The young queen will make a couple of orientations flights that last about 5 minutes where she figures out where she is in relation to the colony. After that she will begin her normal mating flights. Most queen flights occur between 2:30 and 4:00 pm while the drones fly between 2 and 5:00 pm.

Queen pheromone (9-ODA) is released by the queen and once detected hundreds of drones will begin chasing her in a "drone comet". After an average of 15 matings she returns to the colony to continue the life cycle of the colony. Mating with many drones creates a colony that is diverse, more stable and able to deal with stress, diseases and pests--all part of a process of natural selection.

There is still much to be learned about DCAs. Hunting for drone congregation areas will greatly add to your knowledge and enjoyment of honeybees and their complex mating behavior. Some people use helium balloons with a queen in a cage or queen pheromone hung below it. I just read an article in the American Bee Journal where they are using electronic drones. Whichever method you use, if you find one this summer you can share your findings with the bee community by posting the location at [mapmydca.com](http://mapmydca.com). Good luck.

## **KEEPING BEES in MARCH**

*Jason Rowan*

Welcome back, a new bee season is upon us. March usually marks the start of the beekeeping season for some of us. However, this winter may have seemed cold to you, but from what I have seen in the bees they think otherwise. One of the best and worst things about being a commercial beekeeper is that the break in the season of beekeeping is relatively short. Only a few months go by until we re-enter

the hives to start checking them for the almond pollination. This allows us a opportunity to address the needs of the hive that may otherwise end up unchecked for many months and would lead to most certain death. What I have seen in the bees this winter has made me very pleased and very troubled at the same time. Many of our hives even without stimulation began raising brood at a rate seen by myself only once some years ago. Every year is different, but the end result of the aforementioned year was a swarming season followed by massive mite loads. So, be on the lookout. If until now, a cursory glance at the entrance or taking a look under the cover is all we have done, it may be time to take a deeper look into the hives.

The beginning of spring gives us the opportunity to wipe the slate clean and get a fresh piece of chalk to start the new season. Mistakes may or may not have been made. Regardless, make note of what worked and didn't, and these can be tools to use in the season to come. Studying bee culture through books, meetings, or YouTube is a great way to prepare. Do your homework. Learning about what you are doing is the only way to be successful. During the month of March, I like to think of the hive as a garden and the work that I do now is the seed that I will watch grow for the rest of the summer. Take great care to stay ahead of your bees. It is the only way to help these creatures grow to their full potential.

First, let's unwrap the hive for the warm season to come. Take off all covering and insulation, including moisture traps, if you desire. Hopefully, your hives are waterproof enough to make it through the spring rains. If not, leave the moisture traps on, but that does not excuse you from looking into the hives.

Pop open the lid and take a look. I would assume that you would wear all the necessary gear, plus smoker. Do things gently, move smoothly. There is no rush. Jarring and making bees fly when the temps are not optimal can cause their death or unneeded stress. Working bees when the days are dry and around 50oF is great, but you can check for weight even when the temps are much lower. You may be able to see the honey and determine that there is plenty or not. You may be able to take a stored frame and pop it in. If you have none, then a winter patty or some fondant may be used as an emergency feed. *Starvation* is one of the *only* things that you can control, so be responsible. You may want to try feeding a heavy syrup or a light syrup to simulate a flow. Putting pollen supplement on is a great way to get a jump start on the season, but know the costs. Every action causes a response in the bees, so think ahead.

If March marks the first time you have looked into your hive, you may have found it to be “deed.” Fear not, you have just joined the rest of us who have found that to be the case as well. Bee keeping is a labor of love and cannot be marked by successes and failures. Just as your hives may have made it through the winter perfect for the second year, do not begin to believe that you have it all figured out. Being a beekeeper is an entomological journey into the world of the wild. Our poor human brains can hardly begin to understand the complexities of the natural world, so don’t beat yourself up. Learn from what has happened and move on with open eyes and mind.

Having said that, why has your hive died? Much can be learned and you can make the appropriate management changes because something clearly did not work. Get a good book or talk with other beekeepers about what you have seen, and you will find that the knowledge gained from those interactions can make a world of difference in the path of a new year. Clean that puppy out. Get rid of old drone combs and junky boxes. Start the year off right. Leaving your dead, AFB hive out to rot because you think you might catch that 100 percent disease-resistant free swarm is not a service to anyone, most of all the bees. Packages and nucs are getting built this month. Get ready. They are coming, so let’s make it work.

If you are one of the lucky ones and your hives came through great, take a look inside. Make sure that hive has a queen. If not, add it to another hive if possible. If one of your hives is weak and one strong, move a frame or two over with brood and bees (no queen) and give the weak one a boost, but mark her for re-queening. Get those queens and supplies ordered and on their way. Don’t be left out when things need to be done.

The last thing I would suggest for starting your garden off right is year is to be diligent about your pests and diseases. This may be a great time to treat for mites and brood diseases. Nontemperature-dependent mite control measures would be best. Please do not think that this is the last of your spring treatments. I have found more and more that the efficacy of most miticides has been greatly exaggerated. Bee aware and keep bees with care. Happy Keeping.



# Pesticides impair the brain development of bees



[CHRISTIAN COTRONEO](#)



Bumblebees are the superstars of the pollinating world as they pollinate from spring to late fall. (Photo: Alexandra Giese/Shutterstock)

According to new research [published in Proceedings of Royal Society B](#), bees suffer permanent and irreversible brain damage when exposed to pesticides.

The research, from Imperial College London, focused on the impact of pesticides on baby bumblebees. Already under siege from what scientists call "[climate chaos](#)," bumblebees are becoming an increasingly rare sight in gardens around the world. But pesticides may be even more harmful than an ever-warming planet in that they don't give a baby bumblebee's brain a chance to develop in the first place.

As study author Richard Gill of Imperial College London [tells CNN](#), pesticides act a lot like a harmful substance might act on a human fetus in the womb.

"Bee colonies act as superorganisms, so when any toxins enter the colony, these have the potential to cause problems with the development of the baby bees within it," he explains. "Worryingly in this case, when young bees are fed on pesticide-contaminated food, this caused parts of the brain to grow less, leading to older adult bees possessing smaller and functionally impaired brains; an effect that appeared to be permanent and irreversible."

In other words, pesticides may be dumbing down bumblebees. And as adults, those compromised bees have a hard time doing basic bee things, like building a nest, navigating and — most importantly for all life on this planet — [pollinating flowers and food crops](#).

### Serving bees neonicotinoids

To understand how pesticides impact bumblebee brains, the researchers administered a heady cocktail to residents of a bumblebee colony: a nectar substitute laced with [neonicotinoids](#). The latter is a class of pesticide that's still commonly used, despite increasing scrutiny from world governments, including an outright [ban in the U.K.](#)

The amount of neonicotinoids given to the bumblebees for the study was similar to quantities found in flowers in the wild. Afterward, researchers used microCT scans to peer deep into the brains of nearly 100 bees from the colony. They found unmistakable differences in bees that had been exposed to neonicotinoids. An essential part of their brain called the mushroom body was substantially smaller. Researchers suspect the mushroom body is the bee brain's learning hub, affecting its ability to understand and perform simple tasks.

The smaller the mushroom body, the less functional the bee.

If pesticides are used on the very flowers they pollinate, it's easy to see how we may have brought bees to their knees — even before you factor in climate change and habitat loss.

"We are still trying to figure out what roles these factors play and how they interact," Gill explains to CNN. "Pesticides are definitely a contributing explanation to why we are seeing declines."

