



Wildlife Center Classroom Series What's the Buzz about Bees?

Wednesday, May 10, 2017



Lauren Edzenga, WCV:

Good afternoon and welcome to the Wildlife Center Classroom Series! Today is all about a very important, but often misunderstood insect: the honeybee!



Lauren Edzenga, WCV:

We will cover the inner workings of a hive, a little about pollination and why honeybees are so important, and some history of apiculture - beekeeping.



Lauren Edzenga, WCV:

Let's get started with the hive!



Lauren Edzenga, WCV:

Honeybees live in large groups, called colonies, within a structure called a hive. There is a certain safety in numbers with these insects, seeing as though they are one of the very few that have adapted to be able to survive the winter.



Lauren Edzenga, WCV:

Within a hive, each bee is born into a specific job, determined by chemical tags within their DNA. Does anyone know the names of some of these specific jobs I'm mentioning?

Comment From Guest

worker bee

Comment From Guest

Queen

Comment From Dad

drone

Comment From Guest

polinating



Lauren Edzenga, WCV:

Awesome! Today I'll be talking a little about drones, the queen, foragers, nurse bees, and scouts.



Lauren Edzenga, WCV:

First, let's talk about the queen.



Lauren Edzenga, WCV:

The queen determines the hive as such, because there is only one queen per hive. She is the only bee within the hive that is able to produce viable offspring.



Lauren Edzenga, WCV:

Does anyone know how many eggs a day a queen can lay?

Comment From Guest

1000



Lauren Edzenga, WCV:

You're close! A queen can lay up to 2,000 eggs a day.



Lauren Edzenga, WCV:

When a queen is born, she mates with as many as 18 drones, and stores their sperm in a pouch in her abdomen, called a spermatheca.

Comment From Guest

from that tiny little bee?

Comment From Carol

Impressive



Lauren Edzenga, WCV:

The spermatheca allows the queen to continually lay fertilized eggs throughout the year, but she usually only lays a few eggs during the colder months and will resume laying in large numbers starting in February. This allows the hive's number to recover after the winter, when all the drones have been kicked out of the hive for the winter.



Lauren Edzenga, WCV:

When the queen becomes too old, she will fly up into the sky with nurse bees, and leave the colony forever. She will have left behind a secretion that is high in protein and fatty acids that will be fed to a few larvae and the chemical make up will promote the growth of ovaries, to which a new queen will hatch.



Lauren Edzenga, WCV:

Does anyone know the name of this secretion?

Comment From Guest

no

Comment From Larry

Royal jelly?



Lauren Edzenga, WCV:

Yes, great!



Lauren Edzenga, WCV:

Since we mentioned them, let's move on to nurse bees.



Lauren Edzenga, WCV:

Nurse bees are always female. Does anyone know what a nurse bee does?

Comment From Guest

takes care of the queen?

Comment From Larry

cleans the hives? Prepares the combs for the queen to lay eggs.

Comment From Pat,NJ

attends to the eggs



Lauren Edzenga, WCV:

Great! They clean wax cells for the queen's eggs, and they also feed the larvae. So, their main job is tending to the queen, as well as the larvae.



Lauren Edzenga, WCV:

On to drones. Drones are always male, and their sole purpose is to fertilize the queen's eggs.

Comment From Carol

Do the drones die in the winter?



Lauren Edzenga, WCV:

Yep! They're kicked out for the winter, and only nurse bees and the queen remain in the hive until the spring.

Comment From Larry

Interesting Lauren



Lauren Edzenga, WCV:

Scout bees have a special job to find the best locations for pollination, and deploy foragers to that site.



Lauren Edzenga, WCV:

Forager bees are in charge of collecting food; pollen, nectar, and water outside the hive.

Comment From Guest

the jobs of the males and females don't seem much different from human life



Lauren Edzenga, WCV:

Ha!



Lauren Edzenga, WCV:

Honeybees communicate to each other with their antenna, and scout bees will essentially communicate a map with directions to the foragers to tell them where food is.



Lauren Edzenga, WCV:

Does anyone know the process by which honey is made?

Comment From Guest

can't say I do

Comment From Carol

nectar evaporates into honey

Comment From Dede

no, but it sure is yummy



Lauren Edzenga, WCV:

Honey is made by the repetitive mastication and regurgitation by worker bees, and is then sealed so that it can be saved and thus accessed over the winter as a nutrient-rich food source.



Lauren Edzenga, WCV:

Does anyone want to guess how many honeybees will be in an average hive at a time?

Comment From Guest

hmmmm 5000

Comment From Carol

20,000?

Comment From Larry

30,000?



Lauren Edzenga, WCV:

Anywhere from 10,000 to 50,000 honeybees!

Comment From Guest

omg



Lauren Edzenga, WCV:

Since we just mentioned scouts and foragers, let's talk about honeybee's most important job ecologically - pollination!



Lauren Edzenga, WCV:

Pollination is the process by which pollen from one plant reaches another. Honeybees are attracted to the plant by its nectar on the flower, and in the process, their fuzzy legs collect pollen, which is then spread and mixed between all the flowers that the bee visits. The honeybee is able to pollinate the plants it visits so that the plant can produce seeds with more genetic variation, and thus propagating more plant growth.



Lauren Edzenga, WCV:

Pollination is a necessity when crops are concerned, because without it, many of the country's crops would cease to exist. For example, broccoli, cranberries, apples, and melons (along with a whole list of others), are 90% dependent on honeybee pollination. Almonds are entirely dependent on honeybee pollination for survival!



Lauren Edzenga, WCV:

Most crops depend on honeybee pollination for not only survival, and propagation, but also maintaining good yield and high quality, as well.



Lauren Edzenga, WCV:

About 2.4 million colonies of honeybees make the food system in the United States possible. Through the help of these tiny insects, the nation's \$14.6 billion dollar food industry is able to thrive.

Comment From Buddy

astounding numbers

Comment From Guest

thank you bees



Lauren Edzenga, WCV:

So, if you love food, you should thank a honeybee!

Comment From linda vb va

so without honeybees and other pollinators we will have much less food.

Comment From Buddy

Do we have enough honeybees for the pollination needs of our crops?



Lauren Edzenga, WCV:

Right now, yes, but that number is dwindling. Creative alternatives have arisen, such as commercial hives that travel across the country following the bloom of certain plants for pollination, but that can be problematic for the bees' health, and can even spread disease to resident bees if the commercial hives aren't healthy.

Comment From Larry

empathizing their importance

Comment From Guest

and Honey Nut Cheerios!

Comment From Carol

Honeybees are small creatures that do a big job!



Lauren Edzenga, WCV:

An irreplaceable one!



Lauren Edzenga, WCV:

In addition to pollinating crops for agriculture, honeybees also produce a wide array of products that many of us women use! In the 80's honey, propolis, royal jelly, pollen, and special types of honey were used for cosmetology purposes, which in turn increase the profitability of beekeeping and wild hives.



Lauren Edzenga, WCV:

Does anyone know how these products made by honeybees are utilized by cosmetics?

Comment From Buddy

Nope

Comment From Carol

Like Burts Bees products?



Lauren Edzenga, WCV:

Yep!

Comment From Guest

Bert Bees

Comment From Buddy

bees wax for lip balm?

Comment From Larry

bees wax

Comment From Larry

Royal jelly capsules

Comment From Buddy

honey for face mask



Lauren Edzenga, WCV:

-Wax is often used to maintain cosmetic consistency.

-Honey and royal jelly have been widely used in facial creams, body creams, and body milks.

-Certain volatile components of honey can be used to make products smell pleasant.

-Propolis - substance used to fix imperfections in the honeycomb - had antimicrobial and anti-inflammatory components that make it ideal for acne treatment, and it's low fat content keeps it from becoming oily on the skin

-Medicinal honey is honey made from select plants that possess medicinal properties that can be transferred to the honey



Lauren Edzenga, WCV:

The reason hive products are so widely utilized in cosmetics is because they contain important bioactive components. The effectiveness of these depends on the age and freshness, as well as whether it was stored correctly, and its floral source.

Comment From Gina :)

awesome information lauren, you're so smart!

Comment From Buddy

I am learning so much today. Thank you Lauren

Comment From Larry

This was completely new to me.



Lauren Edzenga, WCV:

I'm glad to hear it! That's exactly what these Classroom Series' are for!



Lauren Edzenga, WCV:

Let's move on to one of my favorite parts - some history on apiculture.

Comment From Buddy

:)



Lauren Edzenga, WCV:

Apiculture = Beekeeping!



Lauren Edzenga, WCV:

Since approximately 830 BCE, honeybees and humans have had a relationship with one another. Some of the earliest accounts are of humans cultivating wild bees for their honey and wax just go to show how important their species is to us as humans.



Lauren Edzenga, WCV:

In the ancient world, the only source of sweetener was honey in many places, because sugar was unavailable simply for the reason that it came from places unknown or too far away for viable trade.



Lauren Edzenga, WCV:

The beehive is the artifact that identifies raising bees and distinguishes it as a passion/hobby more than utilizing wild honey collection.



Lauren Edzenga, WCV:

Let's talk about one of the most famous ancient cultures - the Mayans!



Lauren Edzenga, WCV:

Did anyone know that the Mayans were beekeepers?

Comment From Buddy

no

Comment From Gina :)

i didn't know that!

Comment From Susan from NJ

I didn't know that Mayans kept bees.

Comment From Larry

Not until now.



Lauren Edzenga, WCV:

In Mayan culture, honeybees were of the utmost importance. In fact, archaeological evidence suggests that the Mayans were the first beekeepers of the Americas, from 250 ACE to 800 ACE.



Lauren Edzenga, WCV:

The Mayans revered the honeybee so highly that beekeeping was one of the most respected professions one could have. They raised stingless honeybees in hollowed logs, and kept strict records in the form of drawn symbolic characters, called glyphs, of their day to day activities tending the hives.



Lauren Edzenga, WCV:

Obviously, for one to keep a daily record of their professional activities shows great appreciation and devotion to one's field, and thus reflects how highly the Mayans regarded bees, and beekeeping.



Lauren Edzenga, WCV:

The stingless honeybees were usually gentle and docile, although they would sometimes bite or assault their victim with fluid that would burn the skin, if provoked.



Lauren Edzenga, WCV:

The Mayans also held festivals for the gods associated with bees, as well as the gods associated with beekeepers, because they believed that each was just as integral and important as the other. The glyphs representing these parties were put everywhere; pottery, frescos, carvings - to exemplify just how important honeybees are to their culture.



Lauren Edzenga, WCV:

Ok, these are my absolute favorite facts about the Mayans and their beekeeping culture.



Lauren Edzenga, WCV:

While tending to the hive, if a honeybee became covered in honey, it was dried and released. If a honeybee were to die in the process of tending the hive, it was wrapped in a banana leaf and buried. Their belief was that all living things have rights, and that humans should not abuse them.

Comment From Buddy

honey I believe was given for medicinal purposes back then



Lauren Edzenga, WCV:

Probably!



Lauren Edzenga, WCV:

Modern day, the world has changed and certain practices are affecting our world and it's creatures in ways we don't yet understand.



Lauren Edzenga, WCV:

Has anyone heard of Colony Collapse Disorder?

Comment From Buddy

yes

Comment From Susan from NJ

Yes. Have they figured out what causes it?



Lauren Edzenga, WCV:

Not exactly, but we'll discuss that in just a moment!

Comment From Larry

I am aware there is a epidemic



Lauren Edzenga, WCV:

Colony Collapse Disorder, or CCD, is defined as a phenomenon in which worker bees suddenly disappear from a colony, thus rendering the hive defenseless and without food for the winter. After a winter, a hive can be opened to find it full of honeycomb, wax and honey, but completely devoid of any honeybees.

Comment From Buddy

I know that there is research into the many reasons it might be happening



Lauren Edzenga, WCV:

The troubling matter about CCD is that when honeybees leave their collapsing hives in bulk, they are leaving their queen as well as completely untouched, intact frames of honey and pollen. What's even stranger is that none of the bees who abandon their hive are found dead near the hive.



Lauren Edzenga, WCV:

Usually, when this happens, for a normally failing colony, the hive will be robbed by neighboring hives or other animals, but the resulting abandoned hives which collapsed from Colony Collapse Disorder seem to be left untouched.



Lauren Edzenga, WCV:

Very eerie, if you ask me!

Comment From Buddy

One reason I read was that a navigation nerve in the bee, like a GPS is damaged and the bees can't find their way home to hive



Lauren Edzenga, WCV:

We will touch upon that in a moment.

Comment From Jakermo

Buddy must have a computer at his disposal, but I didn't see it when I visited WCV. Maybe it is in his private room. He knows quite a bit about Bees!



Lauren Edzenga, WCV:

CCD came to the forefront in 2006 when honeybees in colonies from all over the United States, Europe and the Middle East started to disappear, seemingly without reason. From 2006-2013, the United States lost over one-third of its total honeybee population, a statistic that is as shocking as it is appalling.

Comment From Buddy

We have a wonderful beekeeper at our farmers market that is very knowledgeable in NEW JERSEY

Comment From Jakermo

I'm sure you will let us know what we can do to help bees! [maybe at the end?] I wanted to help.



Lauren Edzenga, WCV:

Of course!



Lauren Edzenga, WCV:

There are many factors that can work against a honeybee's survival. Habitat loss, climate change, pesticides, and herbicides are all things people are contributing to a future without bees. Pesticides and herbicides are particularly troubling because being pollinators, honeybees rely on visiting hundreds and thousands of blossoms on plants that are potentially covered in poison.



Lauren Edzenga, WCV:

Buddy just eluded to this a moment ago... Scientists have been studying the affects of an ingredient within pesticides and herbicides, called Neonicotinoids, that they believe affect the bee's navigation sense. So essentially, a bee will leave the hive and lose his way back, and never be able to return because of this damaged nerve.



Lauren Edzenga, WCV:

Other environmental threats that honeybees face are parasites, poor nutrition because of monoculture, and various pathogens. Because of many different factors, our agriculture is becoming more and more monotone, in that we have much less variety in our fields than before. Just like our diets, honeybees rely on a variety of different food sources to be healthy.



Lauren Edzenga, WCV:

Cumulatively, all of these stressors put together are the major issue. Which factor or combination of factors is the root cause cannot be pinpointed right now because of a lack of in depth research of all the possibilities. I hope that answers your question from earlier, Susan from NJ!

Comment From Larry

You wonder after all these years how the honeybee has done so well (until recently).



Lauren Edzenga, WCV:

Unfortunately, traditional research in a laboratory would be next to impossible due to the nature of the subject being studied. Being the nature of the honeybee to pollinate various types of plants, it would not be feasible to replicate that in a laboratory setting.



Lauren Edzenga, WCV:

Furthermore, an enclosed hive system would not be realistic in the least because the honeybees would not be exposed to the many other factors that are naturally present in the outdoors.



Lauren Edzenga, WCV:

So how can you help? Does anyone have any ideas?

Comment From Carol

I have read that college campuses are raising bees on campus. Washington College has a rooftop hive and garden.

Comment From IARRY

Encourage local beekeeping in your area and buy local honey



Lauren Edzenga, WCV:

There are many, many, many ways to help our bees. Let's go over a few ideas...



Lauren Edzenga, WCV:

Become a beekeeper!



Lauren Edzenga, WCV:

The best way to resurrect honeybee populations is to simply become a backyard beekeeper. Considering that it is a beekeeper's job to keep their hive healthy and thriving, this very practice would help increase healthy colony populations.



Lauren Edzenga, WCV:

By providing this year long service, beekeepers' hives would be able to pollinate more plants locally, which would then support other hives in the area that pollinate off the same plants.



Lauren Edzenga, WCV:

If being up close and personal with thousands of buzzing honeybees is just not your gig, plant an organic, chemical-free garden full of plants that are beneficial to honeybees.

Comment From Larry

Encourage others to avoid pesticides, go natural/organic.



Lauren Edzenga, WCV:

That's a great thing to do anyway, for more reasons than just honeybees!



Lauren Edzenga, WCV:

Although there are honeybee favorites, such as lavender and Forget-Me-Not's, the combination of plants and flowers should be determined by our local flora in this area to ensure that no invasive species are introduced. By providing plants and flowers that honeybees can utilize, it will increase local hive's chances of success because it will give them a definite source of food, as well as a food source that will keep their metabolism going on the way to other areas.



Lauren Edzenga, WCV:

Also, the organic garden will be healthy for the honeybees because it won't include any harmful insecticides, pesticides or fungicides, which only accumulate in the honey and poison them over the winter. Creating diversity in a densely planted bee garden also aids the hives because it will create diversity in their diets, which is hindered by monocultures.

Comment From Guest

the stuff people use to fertilize their lawns is harmful to bees

Comment From Buddy

My sedum plant is loaded with bees in the early fall.



Lauren Edzenga, WCV:

Last but not least, something that the average person can do that does not want to directly interact with bees or may not have a green thumb is to promote the dwindling practice of research on honeybees to conclusively find the cause of Colony Collapse Disorder.



Lauren Edzenga, WCV:

Another approach would be to buy local, organic food. This is a great way to ensure that there are "safe" agricultural sites that honeybees can pollinate from out there. While at your local farmer's market, check out the honey. Buying raw, local honey directly benefits beekeepers in your area, and thus their hives.

Comment From David in VA

I plant many different types of flowers every year. And, my 1600 square foot of garden gives bees LOTS of blooms to feed from.



Lauren Edzenga, WCV:

When tending to your lawn, leave the clover and dandelions. It has been found that these weeds, as humans categorize them, are essential "pit-stops" for honeybees on the move from pollination area to pollination area.



Lauren Edzenga, WCV:

They provide small doses of sugar that allow the honeybee to continue to fly and not die of exhaustion along the way. On the subject of traveling honeybees, putting a small basin of water out can be majorly beneficial to a thirsty, busy bee.



Lauren Edzenga, WCV:

This point has been mentioned time and time again, but to reiterate it; humans simply cannot live without the benefits that honeybees bring to us. Sure, we could live without honey and use sugar as a substitute, but we absolutely cannot live without crops.



Lauren Edzenga, WCV:

Our every aspect of life depends on them. There would be no new plant based-clothes and textiles, as there would be a lack of cotton plants. Most of all, our crops would completely die out within a few years without pollination efforts from honeybees.



Lauren Edzenga, WCV:

Honeybees make our world possible by pollination.



Lauren Edzenga, WCV:

Thank you so much for tuning into this month's Classroom Series!!

I hope everyone learned something about honeybees. Does anyone have any questions?

Comment From Buddy

Very informative presentation Lauren

Comment From Larry

Your presentation makes you want to go out and start an apary.

Comment From Susan from NJ

Are honeybees all over the world or only in specific places/climates?



Lauren Edzenga, WCV:

Honeybees exist all over the world! Anywhere that isn't too cold, has bees. Honeybees vary in species from place to place, though.

Comment From Buddy

I am going to plant lavender in my garden.

Comment From David in VA

Thank you Lauren, Quite helpful and informative.

Comment From Emily

Very interesting!! Thanks for teaching me something new! :)

Comment From Larry

Most local counties have beekeeping associations to start to involved.

Comment From Larry

Lauren, I enjoyed reading your blog today about bees !



Lauren Edzenga, WCV:

Thank you, everyone! :)

Comment From Carol

I am happy you are so passionate about honey bees. Can you share your blog web address with us?



Lauren Edzenga, WCV:

<http://wildlifecenter.org/b...>

Comment From Carol

Thank you!

Comment From Larry

Thanks for buzz on bees.