Williamson County Area Beekeepers Association

NEXT MEETING:
TUESDAY September 24th
7:00-9:00 Program
Georgetown Public Library

Meeting Dates

Tuesday September 24th
Tuesday October 22nd
Tuesday November 26th
No meeting in December

Meetings are the 4th Tuesday of each month.

September Program

7:00 pm **How Bees Make Honey**
Annual Honey Tasting Competition

https://www.facebook.com/events/2380440485403196/

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Problems with Queen Bees

An article by Roger Patterson from Phil Ainslie, President

Many Years of problems and Still No Solution

I started beekeeping in 1963 and since 2002 I have been trying to highlight problems I have experienced with queens that I rarely saw until recently. I am a very experienced beekeeper having 130 colonies for about 15 years at one stage. I am heavily involved with my local BKA and travel widely giving presentations and demonstrating, so I speak to a lot of beekeepers and see a lot of colonies. I am not a new beekeeper with limited experience who has seen something a few times, or is confused by what I see.

There are several problems and what may be associated problems, but they can largely be put into three groups as follows:-

1. Young queens failing.
2. Young queens being superseded.
3. Queens "disappearing".

In addition there are a few other problems that I have seen on a number of occasions. These have appeared fairly recently and may be connected, some of which are mentioned later.

A bit of History.

In my earlier years of beekeeping there were very few problems with queens. About the turn of the 21st century I started to observe several issues with queens and their performance I had rarely seen before.

What I write about below seems to be quite universal and is becoming recognized by a growing number of beekeepers, not only in the U.K. but elsewhere. I gave a presentation on the "Queen Problems" at the SICAMM conference in Switzerland in September 2012. This was an international event with beekeepers of all abilities from all over Europe. Afterwards I had a queue of people wanting to speak to me, to tell me they had experienced exactly the same problems I had described. One French researcher said she was pleased she had heard my presentation, because she had been seeing the same problems for several years. She had discussed it with her colleagues who said she must have been doing something wrong!

At the National Honey Show (NHS) in 2013 I spoke for some time to Michael Palmer, a beekeeper from Vermont who had 1500 colonies. He told me he had exactly the same problems I had described. At the 2016 NHS I spoke to Dave Tarpy, a U.S. bee scientist who also has problems. Within a couple of days I had a phone call out of the blue from Willie Robson, who runs 1800 colonies in the Scottish Borders asking advice. The following day I had a call from Dorian Pritchard to discuss the same. In June 2016 I gave two x 2 day Bee Improvement workshops in the Hudson Valley area of New York State. I inspected about 100 colonies in 5 apiaries. There were problems with queens in each apiary.

On March 3rd 2018 we inspected a colony at the Wisborough Green BKA apiary. There were emergency cells in amongst worker brood. On 6th April 2018 I had exactly the same in one of my colonies at home. Neither of those colonies had been inspected since at least the previous autumn, so had not been disturbed. I am an experienced beekeeper and know what should happen, but an inexperienced beekeeper probably wouldn't notice.

I have been in discussion with many other beekeepers who tell me they have the same problems. They are widespread, so why is there so much denial? I think there are several reasons. The standards of beekeeping are often quite low, so many beekeepers simply don't understand what should be happening in a colony. I'm surprised at the number of beekeepers who have been keeping bees a reasonable length of time who just don't know the "basics". These are the simple things we need to know in order to manage our bees reasonably well.

Many people have come into beekeeping since these problems with queens have appeared, so they don't recognize them as a problem, in very much the same way as the effects of varroa - they think what they see is the norm. This is becoming more evident when I speak on the subject, as with the passing of time there are fewer people who agree that things aren't as they once were.

I often ask if the audience have seen the problems I have been highlighting. There is usually little reaction until I start explaining what I have seen, then heads start nodding or they whisper to the person next to them. They do see it, but they think it is normal. I often look back at what happened to bees in the wild before our intervention. I have a presentation "Honey Bees in the Wild - What Can we Learn From Them?" and the page on "Natural Honey Bees Nest" where I discuss their survival. Honey bees must have had to keep a fairly stable population based on the process of natural selection. They could not have survived for long if they suffered the queen problems we see today, many of which are terminal for a colony.

What should happen?

A queen, depending on her prolificacy, should live for perhaps 3-5 years. I have had many that have managed the latter or beyond. I have rarely culled a queen due to age, as the type of non-prolific queens I prefer will normally perform well throughout their lives. Depending on a number of circumstances, a queen will swarm, or attempt to, perhaps 1-3 times during her life. Some won't at all, yet others, such as carniolans may swarm twice in the same year. She should be superseded in late summer or autumn and very often still be in the colony alongside her daughter the following spring. This is what happens naturally and is in all the old books.

What is happening now?

Young queens failing.

This is very often in their first year, with many showing signs of failure within weeks of starting to lay, although initially they may appear to be performing well.

Very often a young queen will lay drone eggs in worker cells for a short time before settling down, but I have seen many colonies where there are initially a few drones in worker cells, perhaps 4-6 per side of comb. This raises concern with me as the

numbers usually increase. I have seen as much as 25% of drones in worker cells. In one case the beekeeper, who had been keeping bees for several years, didn't recognize there was a problem. When I pointed out the single drones in worker cells he said "they are always like that"!

Young queens that are performing well should lay the correct number of eggs compared to the size of the colony, the time of year and the amount of food available.

If you see a full colony in the summer during a nectar flow and the queen is only laying on perhaps 2-4 frames, with the brood scattered, or the pattern of eggs is poor, when at the last inspection all appeared to be well, with brood across the box, then you know the queen is failing.

In my experience, once you first see the above, the queen usually only lasts about 6 weeks before being superseded, or she "disappears".

Young queens being superseded.

This is often in their first year and I have regularly seen supersedure cells started before the young queen's first brood is sealed. Very often the brood appears to be good to my eye. The cutting out of these cells usually results in others being built and, if continued, my experience is the queen will usually fail or "disappear" in about 6 weeks.

Supersedure cells can be built anywhere on the frame or comb, not always on the face as we are often told. I find they are very often on the periphery of the brood nest and on several occasions I have seen them on combs with no brood on. Individually, supersedure cells look like swarm cells, but you can determine them by the quantity. I have a saying of "usually one, often two and occasionally three". Any more than that and they are likely to be swarm cells.

Colonies will swarm on supersedure cells and this is a major problem, especially if there is only one that is on a comb towards the outside of the brood box that has been missed, or you haven't gone that far because you haven't seen any queen cells, so aren't expecting any. On many occasions I have had a call from a beekeeper saying they have had a colony swarm that haven't got any queen cells. I advise inspecting the colony fully, lightly shaking the bees off frames, which often reveals one or more sealed supersedure cells.

When young queens are introduced into a full colony the bees will often build supersedure cells, especially if they are introduced to a colony where the previous queen was laying well. This is common where they were mated in mini-nucs or have been banked for some time. In these cases I assume the bees realize the queen isn't up to speed, so try to replace her. The removal of these supersedure cells usually allows the colony to settle down. This is not what I'm indicating, as this is usually overcome when the queen comes into lay fully.

Queens "disappearing".

This is odd, as there seems to be no sensible explanation. I clip my queens and normally do 14 day inspections. At the Wisborough Green BKA teaching apiary we meet every 10 or 11 days. Good records are kept. You can inspect a colony and find no problems, with no supersedure cells and no problem with the quantity or visual quality of the brood. At the next inspection you can find the queen will have stopped laying instantly, but in about 50% of cases there will be emergency cells, the other 50%, nothing. A check on the age of the brood very rarely suggests the queen may have been damaged at the previous inspection.

The lack of emergency cells may be significant as it suggests the queen has gone off lay, but stayed in the colony for several days, so there are no larvae young enough to be converted into emergency cells. This is one reason I think there might be some "interference" with pheromones (see below) as there are other unexplained things happening that are possibly pheromone related.

Other issues

At one time a prime swarm could be collected, hived and left for the rest of the season to build up with little attention, as it would naturally. Prime swarms would usually have a fertile queen that would last at least until the end of the season, when perhaps she may be superseded. Currently there are many more prime swarms with virgin queens in than there used to be. Very often those swarms with fertile queens will have the queen superseded or she will fail soon after hiving, with drone laying being a major problem. I believe the former may be caused by the colony swarming on an emergency cell, where perhaps the queen has "disappeared", the latter where a colony has swarmed on a supersedure cell and the queen that has gone with the swarm has soon failed.

There are many reports of "queenless swarms". I suspect there is a queen there, but she has already stopped laying before swarming and doesn't come into lay again. Why does she not lay? Is it a physical problem or do the bees not get the message that she needs feeding more?

In late July 2016 a local beginner had a colony that had become queenless. It had been queenless for some time, so I found two large swarms for him. As it was late in the season I hived them together by running them into the queenless hive. We put a board in front of the hive and chucked both swarms out together. At the same time another member wanted a queen to requeen a bad tempered colony, as a short term measure. I picked one of the queens from the bees that were running up the board and introduced to the bad tempered hive, leaving the second queen to head the two swarms and queenless colony. Although both queens survived, they both failed.

Queen introduction is nowhere near as simple as it once was. At one time you could take a queen out of a colony, put another queen in a cardboard matchbox or a queen cage with 3-4 workers and place her in the colony immediately. If you went back 24 hours later you could release her, or she would have been released by the bees and there would be no further problems. It was almost unheard of to see emergency or supersedure cells a few days later as is now often the case. For some strange reason some colonies refuse to be requeened. On many occasions I have tried several queens, queen cells, combs of eggs and larvae and they flatly refuse to accept any opportunity of a queen.

On several occasions I have seen both swarm and emergency cells in a colony at the same time. Unless there has been a manipulation by the beekeeper, such as the queen and some swarm cells removed, this shouldn't happen. Surely the worker bees are getting conflicting messages.

In the past a test comb was very reliable, but in the last few years I have come across several instances where the colony is clearly queenless and they won't build emergency cells (or accept queen cells).

At an apiary meeting of the Wisborough Green BKA on Wednesday 25th June 2014 we inspected 28 colonies and 10 of

them had at least one of the problems I mention above. Several colonies had queens laying, yet there were emergency cells in the colonies. The following day I inspected another and found that had a problem too. This is not a small sample and within shouting distance of 40% of colonies with problems. This is not normal.

There is absolutely no doubt in my mind there are problems and at a guess there may be several causes. The really sad part is that despite there being widespread problems, nobody seems to want to do anything about it. It has been suggested the lack of historical information is the issue, but there are parts of the world where I don't believe there are problems, so there may be a natural control population. In my opinion there is an excellent opportunity for a research establishment to do some meaningful research that may help all beekeepers. I probably know more than anyone on the subject and I would be more than willing to help.

I don't know how many times I have heard that queens aren't getting mated properly because of bad weather. In my experience the same problems arise when the weather is good, but these people don't have an answer for that. I don't think we understand enough about mating in general to make sweeping statements like this. I understand that all bees are capable of forming drone assemblies, but only the native bee Amm is capable of what is called Apiary Vicinity Mating (AVM), so perhaps the answer might be to use native bees.

The success rate of getting a queen mated has reduced considerably. At one time, once you saw a queen cell that had been vacated you could leave a colony for 2-3 weeks and when you went back there was usually good brood. The usual answer if a colony becomes queenless after emergence is the "birds" took them on their mating flights. I'm not buying that one. I think it may happen in a very small number of cases, but not at the rate it is now. Just think of the number of bees there are likely to be on the wing when a queen goes out to mate. The mathematical chances of a queen being taken are very low. I strongly suggest everyone looks at the wings of virgin queens, as there are now a significant number that emerge with deformed wings. This varies from tiny stubs to almost full wings that are crumpled at the tips. I think they may emerge from the hive to mate, but don't get airborne. This suggests a possible virus problem, so perhaps we should look in that area.

What are the reasons?

I am an engineer by trade, not a scientist, so I will try to leave the answers to others. Amongst the more sensible suggestions that have been made to me, though not in any order are:-

- **Chemicals**. That are administered both inside and outside the hive.
- **Disease**. Varroa and associated viruses and queens infected with nosema. Unless the nosema is Nosema ceranae, I think this is doubtful, as we have always had Nosema apis and we never used to have the problems.
- **Bad beekeeping.** Good beekeepers have the problems and there have always been bad beekeepers.
- **The weather**. This always gets the blame, probably because it's an easy answer, but queens are still failing when they get mated in good weather. In West Sussex we had a very good summer, but we still had the problems an at the same rate.
- **Mobile telephone masts**. I think these may be too quickly dismissed by some.
- **Inbreeding.** There are several locations where there are small closed populations. Some are regularly monitored and there are few problems. Bearing in mind the density of colonies in most locations and we are told there are drones from 200-250 colonies in many Drone Assemblies, I think inbreeding is extremely unlikely.
- **Poor drone quality.** We know that drones that have been parasitized by varroa and subject to some chemicals have a lower sperm count. Drone culling and the reduction of feral colonies is blamed by some, but I think there are still enough drones. When I give my presentation there is usually a point made by someone that drone culling is to blame. I then ask how may attendees cull drones and it is usually well below 10%. This is little different than the number of beekeepers dropping by 10%, so it isn't an issue.

Some of my guesswork.

By speaking to local beekeepers, it seems there is a possibility that the increase in viruses may be an issue, especially if queens are heavily infected. Perhaps infection is through their larval or adult feeding, or during mating where viruses may be transmitted by drones.

I am an observant beekeeper and with my engineer's mentality I use a bit of logic. What follows is something I have been thinking about for some time. I must stress it is no more than a non - scientific theory, but please feel free to pick as many holes in it as you like.

Many of the problems could be pheromone related. I have done no reading on them, but with my practical engineers mind I see a pheromone as a substance that is made up of a number of components, each one having a different percentage of the whole. I'm guessing that if one or more components has a different amount than it should have, or is missing, it gives a different message to the worker bees.

Pheromones are chemicals and chemicals can be altered, something we all know from our school science lessons. My thinking is there may be some sort of "interference" with the pheromones, perhaps with chemicals that are coming in from outside the hive, or those administered to the colony. If that modifies the pheromone it may give the wrong message to the worker bees. I hope I explain myself adequately.

If the above is close to being a possibility, it may explain some of the things that are happening with queens.

- The queen is normally fed by the workers, presumably because she is producing a pheromone, so they recognize her as a queen. If the pheromone changes, so they don't recognize her as a queen, could the bees not feed her, so she starves, hence what I see as "disappearing"?.
- If the pheromone changes slowly the queen presumably gets fed progressively less food, so her egg laying reduces and why she appears to be failing.
- If the pheromone reduces, could it be why the colony build supersedure cells? When queens are fed they receive queen substance. If that is at a low level ittriggers off the laying of eggs in queen cups.
- Where I have noticed less success with queen introduction, or where recently introduced queens are quickly superseded, are the pheromones already reducing and the queen would have been superseded if left in the original colony?
- I'm baffled by swarm and emergency cells in the same

colony, because there is a different message being given to the workers. I haven't thought too much about that yet.I accept the above is conjecture, but in the absence of any other explanation, let's chuck it in the pot with everything else. One thing is for sure and that is it's a better bet than keep blaming the weather and birds!

I know this won't affect all beekeepers, but here is another suggestion. In a natural bees nest there are usually holes in combs. I reckon these are created by bees to improve communication and travel around the colony. My guess is that queens use these to get around the hive to spread footprint pheromone and give more bees the chance of taking queen substance. Many beekeepers use large frames and discard those with holes in. An increasing number are now using plastic foundation that bees can't chew holes in. Does this allow the queen to spend a long time, perhaps an hour or so on one large surface, preventing a free flow of chemical messages, so bees on combs where the queen has been absent for some time may think their queen is failing?

Why has there been little or no progress?

I have tried desperately hard to make beekeepers aware of the above problems over a long time and I have become very frustrated at the lack of progress. I have tried to highlight them, but I have experienced negative reactions from people in influential positions who I think should know better. Quite frankly some simply don't believe me and dismiss what I tell them that I have seen with my own eyes. I have come to suspect that some well known beekeepers may not be as knowledgeable or observant as their status in beekeeping suggests. The cynic in me wonders how often they inspect their own bees or if they understand what they are seeing.

On several occasions I have been told by beekeepers they didn't have a problem, but when I ask to look at their bees, I often see some. As always, when some people don't know much about a subject they rubbish it, ignore it or try to discredit it. I have been asked to provide proof there were previously no problems, but who records things when they go well?

The negativity or lack of knowledge of some beekeepers probably has a bearing on it. I have been openly told that the reason I have problems is because I'm a bad beekeeper, which I find unhelpful and offensive. I am doing the same as I have for 50 years and I'm more than happy to inspect colonies in front of anyone.

What can be done?

I think beekeepers can do quite a bit on their own, but it needs to be in an organised way, not a scattergun approach. I am not a biologist and know little about anatomy of bees, but I think beekeepers who have an interest in microscopy can dissect queens to study spermatheca and ovaries. If there is variation from the normal healthy organs this could provide data for researchers to take further. Starting in 2015 we are doing that in West Sussex BKA, but unfortunately the microscopist moved to Norfolk and was unable to continue.

I am out of my depth already, but my hope is that any abnormalities could be tested for diseases, viruses, poor sperm, etc.

My thinking is that queens in fairly high numbers are easy to produce during the summer, so could be used in a number of ways, as virgin and fertile queens. I am prepared to do this myself and I think I know a number of queen rearers throughout the country who would also be prepared to provide material.

There are a number of locations that are still varroa free and to the best of my knowledge have no problems, so queens reared there could also be tested to see if they have problems.

I have some good news on this! There has been some research work done in Canada. See here. I'm pleased that it shows there really are problems and they aren't just confined to my hives as some people think. It might also show that I'm not a bad beekeeper after all.

Roger Patterson.

Picture by Dan Eudy

Williamson County Area Beekeeping Association
Meeting Summary - August 20th, 2019 meeting.

The meeting was opened by Phil Ainslie, President, at 7 pm.

President's Announcements

1. William Jenke has bee hives and equipment for sale. He has decided to sell his hives since developing a severe reaction to bee stings. More information can be found on the WCABA website, under "MarketPlace."
2. Bee Buzz will be at Rudy's BBQ, at the IH35 location, in Round Rock from 2 pm -4pm. This is an informal, come and go, meeting to talk about any aspect of bees that you please. The meetings will be on the Sunday following the monthly WCABA meeting.
3.The WCABA is still in need of mentors to support our members. You can get more information from the WCABA website under "Mentor/Mentee program".
4. The next meeting will be the honsey tasting and judging. Participation is encouraged. Jimmy Oakly has a supply of small jars for the tasting, and larger jars for the Texas state fair.
Beekeeping 101 - A splendor of ice cream and toppings, which was well presented by Matt Lundren. General socializing occurred with vigor.

Beekeeping 102 - A lively, and information, question and answer time. The panel comprised of Phil Ainslee, Jimmie Oakley, Alaine Heivilin and John Hibbard.

Door Prizes. -9 lucky winners (John Hibbard was one the prize winners. It was noted that he called his numbers out prior to his number being drawn !!)

Members Present:- 64

From the floor :- Butch Miller is in needs of someone to go and look at his hives, and provide feedback. He lives East of IH 35.

Mark on your calendar - October, 5th - Fall Garden Fest in Hutto. Speakers from the National Plant Society, and many more. Go visit and discover more plants that your bees will love.

The meeting was closed early, 8.35 pm by Phil Ainslie, President.
The next meeting will be held on **Tuesday September 24th** at the Georgetown Library.

Gillian Mattinson.
Secretary, W.C.A.B.A.

WCABA Honey Tasting & Judging

Everyone is **welcome** to join in the festivities to celebrate National Honey Month at our September meeting. We will have a big honey tasting and also honey judging for honey going to the State Fair in Dallas.

The club's extracting equipment has been very busy this year and reports are that much honey has been extracted, so if you have extracted honey this year you are encouraged to bring a baby food size container of your best to see how it stacks up against the other club members participating in the "Tasters Choice" competition. It's all for fun and you might be a winner.

Honey going to the State Fair for display in the Texas Beekeepers Association Honey Booth needs to be in a 2-pound glass jar with a metal cap and can contain your label already affixed.

I encourage you to bring your honey and help make this a fun and memorable event.

Thx. Jimmie Oakley - Event Coordinator

LINE UP DISPLAYED AT THE STATE FAIR OF TEXAS LAST YEAR

TASTER'S CHOICE

SUBMIT TASTE VOTE

Scholarship Beekeepers Make Fall Splits and Requeen

The WCABA Scholarship Program recipients have reached another milestone in their Program for this year. After completing the four-week summer mite treatment regimen with Apiguard (thymol gel), and they have successfully divided their colony using the vertical hive splitting technique taught by Randy Oakley at the WCABA meeting in July of this year.

The process calls for the creation of a "piggyback" nuc in the top box of the hive at the end of summer after honey has been extracted, treatment administered, and the colony is coming out the summer dearth and into the fall honey flow.

Nuc consist of 3 frames of brood, plus frames of pollen and honey and a feeder

This was accomplished on the last Thursday in August when everyone met at the Georgetown Heritage Garden. Each recipient worked through their hive, pulling up fames of brood, pollen, and honey from the brood chamber to assemble the nucleus hive, shaking off all the adhering bees into the bottom box to assure the queen stayed with the original hive. The nuc was then placed above a queen excluder to allow the nurse bees to come up and cover the relocated brood frames. Sugar syrup and pollen supplement was added to nourish the newly established nuc. Finally, a new caged queen was inserted into the top box, protected with "Gorilla Tape", to be liberated later. This would allow the bees to preview her "queen scent" sooner than later and hopefully help hold bees in the top box.

Randy Oakley & Bailey Brett assess hive resources to make Piggyback split

Nuc is "piggybacked" on top of original hive above a queen excluder

The first Thursday in September the youngsters were back at the Heritage Garden to check the piggyback nuc for queen cells and pull the tape from the queen cage to allow the introduction process to begin. The queen excluder was removed and replaced by a double screened bottom board that separates the bees in the nuc from those in the original hive.

One week later the excluder is pulled... *...and replaced with a double screened divider*

The double screen allows the heat for the bottom box to be shared with the nuc. The double screened bottom was attached to the nuc hive with staples and the rear entrance was opened to allow access opposite from the forward-facing entrance of the bottom box. In theory the old field bees will fly out the back entrance the next day and return to the hive below. This would leave only nurse bees and house bees in the piggyback nuc which are more accepting of a new queen.

Eli Crozier and Randy Oakley have set apart his hive in preparation for making up the "piggyback" nuc

Reece Brett finds a nice frame of brood for his hive split as Eli Crozier observes in the background

Quinn Bramwell feeds the piggyback nuc on his hive

Randy places a caged queen in Quinn's piggyback nuc

Scholarship recipients look satisfied with a job well done !!

The schedule calls for the scholarship recipients to return again in two weeks to look for the new queen (with green mark), check for eggs, access the brood pattern, and determine the level of stores in the hive, and feed syrup if necessary.

Routine checking and maintenance will continue till later in the fall (November) when another sampling of the bees for mites (alcohol wash) will be taken to determine if another mite treatment will be necessary, this time with Formic Pro (formic acid), to get the bees through the winter months and into spring.

Another treatment option would be the Oxalic Acid drench or vaporization method in January when the hive is almost broodless and most mites are exposed. * Jimmie Oakley – Scholarship Committee Chair

How to Treat Wax Moths

from BeeKeepClub

Honeybee colonies face a great number of threats in their beehives. The wax moth is one of the many pests that can cause damage to bee colonies. There are two types of wax moths: the lesser wax moth and the greater wax moth. Both have similar methods of causing trouble in a beehive. The greater wax moth is more prevalent in beekeeping regions, and causes more damage than the lesser wax moth.

When a wax moth enters a beehive, the bees will generally attack and kill it. In cold weather, bees may leave entrances unguarded and cluster deep in the hive. This is when wax moths get a chance to enter the hive and lay eggs. The wax moth itself is of no problem to bees, but its larvae are the destructive agent.

In this article we will discuss how to treat wax moths in beehives, but first, let us take a look at the wax moth itself.

What are Wax Moths?

Wax moths are insects that prey on honeybee larvae. They enter the hive through upper entrances and spaces in the exterior of the hive. Wax moths can fly in cooler temperatures than bees. They mate and lay eggs in the night.

A wax moth infestation of an apiary or beehives is terrible news for beekeepers. Wax moth larvae prefer comb that has been used by brood and has contained pollen in the past. It is also important to note that the wax moth larvae can live on beeswax alone. They are thus a problem in honey supers as well.

The lifecycle of wax moths is heavily influenced by climatic conditions, especially temperatures. It starts with an adult wax moth laying fertile eggs in a beehive. The greater wax moth female lays up to 800 eggs while the lesser wax moth lays up to 300 eggs. After a few days, the eggs hatch and wax moth larvae emerge. At warm temperatures, the eggs can hatch in 3-5 days. In cold temperatures, it can take up to a month before the eggs hatch.

The larvae feed on beeswax and other material in the hive. It makes tunnels in honeycomb and releases a sticky web-like substance. Individual larvae then spins a cocoon around itself and enters the pupa stage. The wax moth pupa then molts into its adult stage. The pupa stage lasts 3-8 days in warm climates. In cold regions, it can take up to 2 months. Adult wax moths mate and the female then lays eggs in a beehive to repeat the cycle.

Things to note:

- Wax moth larvae take around 19 days to develop into the pupa stage in warm climates. In cold areas, it can take up to 5 months.
- Adult wax moths only feed on liquids for their entire lifetime. Rotting fruit, nectar from flowers and pollen are favorite foods for adult wax moths.
- Adult wax moth males have a lifespan of 21 days. Females live for 12 days. The males use a combination of ultrasound signals and pheromones to attract females.

Symptoms of a Larger Problem

Wax moth infestations are a symptom of an underlying problem. This is because the honeybee colony must be weak for a wax moth infestation to take root. Even after getting rid of wax moths in the beehive, you must identify and address the underlying problem with the beehive or honeybee colony. The measures you take against a wax moth infestation and their effectiveness are affected by the time that lapses between the start of the infestation and your intervention.

There are various ways of preventing wax moth infestations and clearing them from beehives as will be detailed in this article.

How do Wax Moths Affect Beehives?

Wax moths lay eggs in spaces and cracks unreachable by bees. When the eggs hatch, the wax moth larvae burrows through brood comb. They eat beeswax and honeybee larvae cocoons left behind when the bee larvae matures into an adult bee. The moth larvae also consume bee feces and bee cocoon silk. Furthermore, wax moth larvae release a sticky substance that bees cannot remove from the comb.

An even worse effect of the sticky substance that wax moth larvae secrete, is trapping adult bees in their cells. The bees become unable to leave their cells and die in place. These adult bees are later removed by worker bees. This has the general effect of lowering the adult bee population in the honeybee colony.

Ultimately, the wax moth larvae makes brood comb unusable by bees. The moths cause a reduction in the entire population of the honeybee colony. The colony gets weakened and vulnerable to other pests, parasites and predators.

The larvae of wax moths are very mobile. They may move from one hive to a next one in some cases. Older wax moth larvae are grayish in color and can be as long as 28mm. The larvae eat away at the wooden surfaces of the beehive in a wavy pattern to create a cocooning space. This causes the structural integrity of the hive to deteriorate. The larval stage of the wax moth lasts approximately 19 days in warm weather.

Wax Moth Control in Stored Supers

Stored honey supers may attract wax moths. The moths lay eggs in the supers and their larvae feed on the beeswax in the supers. This damages the stored comb in the supers as well as the wood used to make the super boxes. Wax moth control in supers is done by freezing and applying a Bacillus Thuringiensis (Bt) solution, ParadiChloroBenzene crystals or Para-Moth.

Freezing frames of honey supers before final storage kills eggs and larvae of wax moths. The box can then be treated using a solution of Bacillus Thuringiensis to prevent later infestation by wax moths.

The Bacillus Thuringiensis kills larvae of wax moths. It does not affect adults much and has no known effect on their eggs. The larvae are the destructive stage of wax moths, and killing larvae is enough to protect stored honey supers.

Beekeepers may also use Paradichlorobenzene crystals to kill moths and their larvae. The crystals are placed in the stored honey super boxes. A newspaper or other light material can be used to hold the crystals in the super boxes. Airing stored super boxes with Paradichlorobenzene is necessary before re-stacking them onto your beehives.

Using Para-Moth

Mann Lake DC130 Para-Moth Wax Moth Control Canister, 1-Pound

Para-Moth is a commercially sold powder product for wax moth control in stored supers. It is manufactured by Mann Lake. Six tablespoons of the Para-Moth solution are placed on a paper plate in the middle of stacked beehive boxes. Each stack is recommended to be five deep beehive boxes or six medium sized beehive boxes. The stack is covered using a tarp or other appropriate weatherproof cover. You should air the beehive boxes before use, after you've taken them out of storage.

Preventative Measures

Wax moths love dark spaces. Storing your honey supers where light enters them helps to prevent wax moths from making a home in them. You could also wrap the boxes with clear paper as an additional measure to keep out wax moths. Storing honey super boxes in outside sheds where they will freeze in winter is very effective for wax moth control in stored supers.

How to Get Rid of Wax Moths in Beehives

Freezing and burning are two sure ways to clear wax moths from your beehive once they have infested it. Both methods are effective and easy to carry out. Wax moth eggs and larvae cannot survive extremely cold temperatures.

In your beehive inspection, look out for signs of wax moth infestation. This involves checking brood comb for wax moth larvae, the sticky webbing they leave behind, burrows and tunnels in wax, and dark droppings at the bottom of the hive. If you are using a screened bottom board, check for dark wax moth larvae droppings under the hive.

Remove infested brood frames from the beehive immediately. Put the frames in a plastic bag and freeze them. Five hours in the freezer are enough to kill all wax moth larvae. As a precautionary move, you may leave the frames in the freezer for up to two days. Make sure your freezer temperature is at or below 20º Fahrenheit (-6.67º Celsius).

After freezing the frames, use a knife to scrape fecal matter and damaged comb from the beehive frames. Using a pair of rubber gloves, remove any wax worms and webbing that may be on the comb or frames. You should then inspect the hive for further infestation before putting the brood frames back in the beehive.

With heavy wax moth infestations, it is better to burn the affected comb. Remove the affected comb with wax moth larvae in it and burn it some distance away from the hive. You may reuse the frames if they pass visual inspection for moth eggs and larvae.

How to Prevent Wax Moths in Beehives

The size of beehive you have and the size of the honeybee colony occupying it are critical factors in wax moth prevention and control. For small honey bee colonies, it is advised that beekeepers remove some boxes. This leaves just the right amount of space that bees can regularly and effectively guard. Too much space leaves some areas of the beehive unwatched by bees. Wax moths then find easy life inside the beehive. As your honeybee colony gains strength, you may add more boxes as appropriate.

The practice of removing honey supers from beehives in winter is useful to prevent bees feeding on the honey. It also leaves less space for bees to guard. Remove honey supers late in winter and store them outside to freeze over if possible.

Preventing wax moth infestations of your beehives is important. It avoids losses suffered even with minor wax moth infestations. Proper hive hygiene is the first step in preventing wax moth infestations. Remove wax and comb that may be lying around in hives. You should also have only the frames that bees are using in a beehive. The rest should be kept frozen or in protective bags until they are needed for use.

Methods of Prevention

Wax moths can spread from one beehive to the entire apiary in a short period of time. Beekeepers should use one or a combination of methods to keep wax moths in check. These include:

1. **Keeping a strong honeybee colony**

Strong honeybee colonies fight wax moth infestations easily. They kill the wax moth as it enters the hive. They also kill and remove wax moth larvae from the hive.

2. **Use of bottom entrances only**

Beehives with entrances and holes in the upper sections are prone to wax moth infestation. Sealing upper entrances and making sure lids on beehives are properly in place prevents wax moths from entering the hive. If you must have top entrances or ventilation holes on your beehive, keep them screened to prevent wax moths entering the hive.

3. **Use of wax moth traps**

Wax moths can be lured to traps specifically set out for them. The trap mimics beehive smells that draw wax moths. The moths then enter the trap and get drowned in it. A wax moth trap is effective to protect beehives and stored honey supers from infestation. A quick wax moth DIY trap is outlined below.

4. **Treatment with Bacillus Thuringiensis (Bt)**

Treat your beehive boxes with a Bt solution as a preventive measure. In the absence of an infestation, this is passive protection. The bacteria kill larvae of wax moths once ingested.

5. **Use foundationless frames**

Having foundation on frames that may be unused and unguarded by bees leaves the honeycomb prone to wax moth larvae. Foundationless beehive frames leave wax moth larvae with fewer honeycombs to occupy.

6. **Using crystals of Paradichlorobenzene**

Place crystals of Paradichlorobenzene in your stored honey supers. They kill adult moths and deter them from entering the boxes. Wax moths may lay eggs on the outer surface of stored honey super boxes. The eggs hatch and the larvae enter the boxes through tunnels they dig in the wood. Paradichlorobenzene is effective against these larvae too. It is a great preventive measure taken with stored beehive boxes. Make sure to air the boxes for a day or two before using them again.

7. **Freezing and rotating beehive frames**

Periodic freezing of beehive frames and rotating them in use are effective against wax moths. Freezing kills wax moth larvae and eggs too. Beekeepers should also have extra beehive frames that they can rotate in the hive. You should freeze frames before storage, and store them in moth-proof bags.

8. **Planting mint near beehives**

Wax moths are repelled by mint. Planting a few plants near beehives in your apiary keeps the moths away from the area and your beehives. You may also leave some branches of mint among stored beehive boxes to repel wax moths.

How to Clean Beehives with Wax Moths

Heavy wax moth infestations require you to clean the beehive, thoroughly. After you have killed off the wax moths and their larvae, you have to remove residues they leave behind. In light infestations, remove the affected boxes from the hive together along with the affected frames.

- Use a hive tool to scrape wax, propolis and wax moth secretions to remove them from affected beehive boxes and frames.
- Clean the frames and beehive boxes with a solution of Clorox or bleach.
- Spray the frames and hive box with a Bacillus Thuringiensis. This is a preventive measure against future wax moth infestations.
- For heavy infestations, it may be necessary to take apart the beehive boxes. This gives you maximum access to spaces where wax moths may have laid eggs.

Can I Extract Honey from Frames with Wax Moths?

Honey super frames may get infested with wax moth larvae. This can happen while the frames are in the beehive or in storage. While it is possible to extract honey from these frames, the honey should NOT be sold or consumed by humans in any way. It is popular among beekeepers to uncap the frames and put them in a place where bees will eat up the honey. This is only done after freezing the frames to kill larvae and eggs of wax moths. The bees benefit from both the honey and beeswax.

How to Make a Wax Moth DIY Trap

A wax moth trap is very effective as a first line of defending your apiary from wax moth infestation. The trap is placed near your beehives.

Materials

To make the trap, you need:

- A 2-litre plastic bottle
- Water
- A drill
- Sugar
- Vinegar
- A banana peel

Steps

- Add 1 cup of water into the bottle.
- Add ½ cup of vinegar to the water, and 1 cup of sugar.
- Cut the banana peel into pieces or strips that can enter the bottle and drop the whole peel into the bottle.
- Shake the contents well to mix them up well.
- Wait a few days for the mixture to start fermenting.
- Once fermentation starts, drill a hole measuring 1-inch under the slope on the plastic bottle's neck.
- Hang the bottle near your beehives. A nearby tree is a great location for your trap.

How the Trap Works

The fermenting mixture in your trap mimics the scent of a beehive. Any wax moth near your beehives will be drawn to the trap. The moths enter the trap through the hole drilled into the neck of the bottle and are unable to escape. The moths eventually drop into the mixture and get drowned. This type of trap also attracts and kills bald faced hornets and some yellow jacket wasps as a bonus.

Traps for moths and butterflies that are not specific for wax moths may come in handy when you do not have the resources to make your own wax moth trap. They are effective against a wide variety of moths and insects. The disadvantage of these traps is that they will entrap insects that you are not targeting. For beekeepers who care about nature and ecological balance, this is not an ideal outcome even as they aim to reduce wax moth populations near and around their beehives.

Pro Tip: To increase the efficiency of your wax moth trap, use a light source near the trap. Light attracts moths and insects in the dark. With a light, you catch more wax moths.

Commercial Wax Moth Traps

A commercially sold version of this DIY wax moth trap is available for purchase. It makes use of a better design of the plastic bottles and the same bait recipe. The trap is effective and easy to use for both amateur and professional beekeepers. It comes with a top that makes hanging the trap easier than the DIY trap. Other commercial wax moth traps are also available and can easily be bought online.

A Final Word

Strong honeybee colonies are great at keeping the beehive free of wax moths. A honeybee's colony strength is based on the number of adult bees in the colony. A healthy and active queen bee is important for maintenance of bee numbers inside the hive. Weak honeybee colonies can be strengthened by supplementary feeding and being allowed to have more brood boxes.

Wax moths are a part of the natural honeybee ecology. In the wild, wax moths are useful in cleaning up after bees. They eat the wax in absconded spaces occupied by bees. A fresh colony can then occupy the same space. In beekeeping however, wax moths cause losses in colony strength and honey yields. Beekeepers should take preventive measures to keep wax moths from infesting their apiaries. If the prevention does not work, it is important that the beekeeper knows how to treat wax moths in beehives. Use the information in this article to keep your beehives free of wax moths and your colonies strong and healthy.

Skep from Dick Count's collection. Picture by Dan Eudy

Bee Glove and Fire Prevention

Well, have you ever done this before…? I answered No!

I've been keeping bees for over 40 years (44 to be exact) and I have never burned up a pair of bee gloves, let alone set a bee yard afire, but it could happen.

This little incident with the bee gloves got me to thinking that during our customary dry months of July and August when we traditionally have our summer drought, and everything becomes fire prone, without thinking and being vigilant it could very easily happen to any of us.

I heard tell from Mr. & Mrs. Bost that they burned their bee truck up with a smoker box fire. After that they carried their smoker around in a metal container especially made for that. No metal box, then try one of the round "popcorn tins" you get at Christmas time to drop you hot smoker into.

In my case I was vigorously puffing my smoker bellow to get my wood chips going, and a "small" (could hardly see it) spark flew out and landed on my gloves laying on the truck bed. Next thing you know I had created a useless pair of bee gloves not fit for anything but to teach me (and I hope everyone else) a lesson.

Remember, as Smokey says, "Only you can prevent Forest (or beeyard) Fires.

Be careful out there and carry a gallon jug of water just in case. Jimmie Oakley – *older and wiser!*

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