

# 'Training the next generation of professional beekeepers'



## Module 9

### Queen Rearing and Selection

Developed by Spey Valley Bees Ltd



Project No: 2019-1-UK01-KA204-062075



Spey Valley Bees

# Why do you need a source of young mated queens?



- To replace old and failing queens
- To set up colonies to replace winter losses
- Making increase or selling nucs
- To requeen queenless colonies
- Swarm prevention/control
- Stock improvement
- Going to the heather



# Topic 1 'Queen Rearing and Selection'



## Introduction

This topic looks at the importance of selecting and raising your own queens and the different methods available.



# Topic 1 'Queen Rearing and Selection'



## Learning Outcomes

Once you have completed this topic, you will :

- Appreciate the benefits of raising your own queens including stock selection principles
- And be able to:
- Complete one method of raising your own queens
- Prepare, stock, maintain and re-use mini mating nucs
- Clip, mark and package mated queens for sale or introduction



# Why Rear Your Own Queens?



- They will be locally adapted
- There will be less risk of introducing foreign disease/pests
- You can select for your own breeding criteria
- Bought in queens are expensive
- Improve your beekeeping skills
- It's good fun!



# Rear Your own Queens, Don't Buy Them off the Internet



# What is the difference between queen breeding and queen rearing?



‘Queen breeding’ involves keeping records, selecting for ‘good’ characteristics and propagating queens from that stock

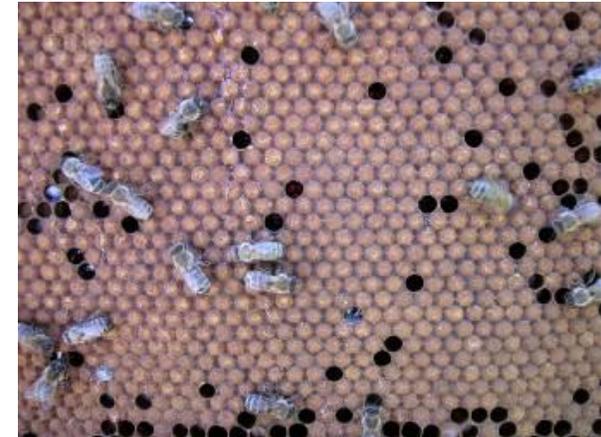
‘Queen rearing’ is simply raising queens without any selection criteria



# Stock Selection Principles



- Choose the criteria that is important to you
- Breed from your best hives
- Keep records (2/3 years)
- Drones also important as they pass on half the genes!



# Exercise – 10 minutes



List the main criteria you would select for queen rearing in the following situations:

1. When you need a strong colony for an early spring crop
2. In the highlands of Scotland which has cold winters and a late spring
3. For an apiary in an urban setting with close neighbours
4. For bees going to pollinate apples in spring



# Exercise – Answers



1. Bees that build up early in the year and fly at lower temperatures
2. Bees that overwinter well, are thrifty with stores and do not produce excessive brood
3. Calm bees that don't follow, don't sting and are not swarmy
4. Bees that build up early in the year, fly at lower temperatures but also collect a lot of pollen



# Selection Criteria you can breed for



- Calmness
- Still on the comb
- Disease resistance
- Overwintering success
- Fecundity (large colonies)
- Productivity (Honey production)
- Swarming
- Local projects (AMM/Buckfast)



# Selection Criteria Explained



<b>Good temper</b>	Few beekeepers enjoy being stung. Stroppy bees produce stroppy neighbours & intolerant family members
<b>Productivity</b>	producing lots of honey
<b>Healthy</b>	disease and parasite resistant
<b>Overwintering</b>	on a minimum of stores
<b>Less likely to swarm</b>	Swarm control and collecting swarms is labour and time intensive. If a colony swarms the loss of foragers means less honey for you
<b>Steady on the comb</b>	makes for easier manipulation and linked to good temper



# General Principles



- Breeder colony – the colony that meets your chosen selection criteria
- Cell raiser colony – a strong colony with lots of nurse bees to feed the queen larvae
- Produce daughter queens from the breeder queens & use them to replace queens in colonies with undesirable characteristics



# Polyandry – multiple matings



- Queen's mate with about 12 -14 drones
- Drones are sexually mature at 12 days old
- A queen generally mates with unrelated stock
- It is difficult to control mating unless you use instrumental insemination which isn't practical
- So we flood the area with drones from colonies that meet the selection criteria



*Photo: Gerry Collins*



# Drone Rearing



- It is important to select drone stock but you have to be careful you are not breeding varroa (the varroa mites prefer to reproduce in drone brood)
- So combine with Varroa Control



*Photo: Gerry Collins*

# Mating Flights



- Mating usually occurs in a drone congregational area recognised by queens and drones over many generations
- Queens fly, 200m – 2km
- Drones fly, 500m – 5km
- This prevents inbreeding and promotes genetic diversity
- It means that drones from neighbouring apiaries are likely to mate with your queens



# Mating Flights



- So, it's a good idea to form a breeding group with nearby beekeepers
- You will have a collective gene pool of dozens of colonies
- You can agree on selection features and share resources and queen cells
- And will have a better chance of success!



# Good Quality Queens



- The best queens are fed royal jelly from egg hatching
- Royal jelly contains nutrients that activate the queen genes
- 2 and 3 day old larvae transferred from a worker to a queen cell will develop into a queen
- After 3 days queen-like workers or worker-like queens are produced
- After 4 days caste is determined



# Queen Rearing Principles



## Need

- A low level, no queen substance, or forced supercedure in the hive
- A crowded brood nest
- An over-abundance of nurse bees
- A good supply of pollen
- A nectar flow or feed syrup
- 1 or 2 day old larvae
- Drone population needed for mating



# Use of Naturally Produced Queen Cells



- You can use naturally produced queen cells to produce new queens, i.e.
  - Swarm cells
  - Supersedure cells
  - Emergency cells
- And you will get perfectly adequate queens but who is control, You or the bees?

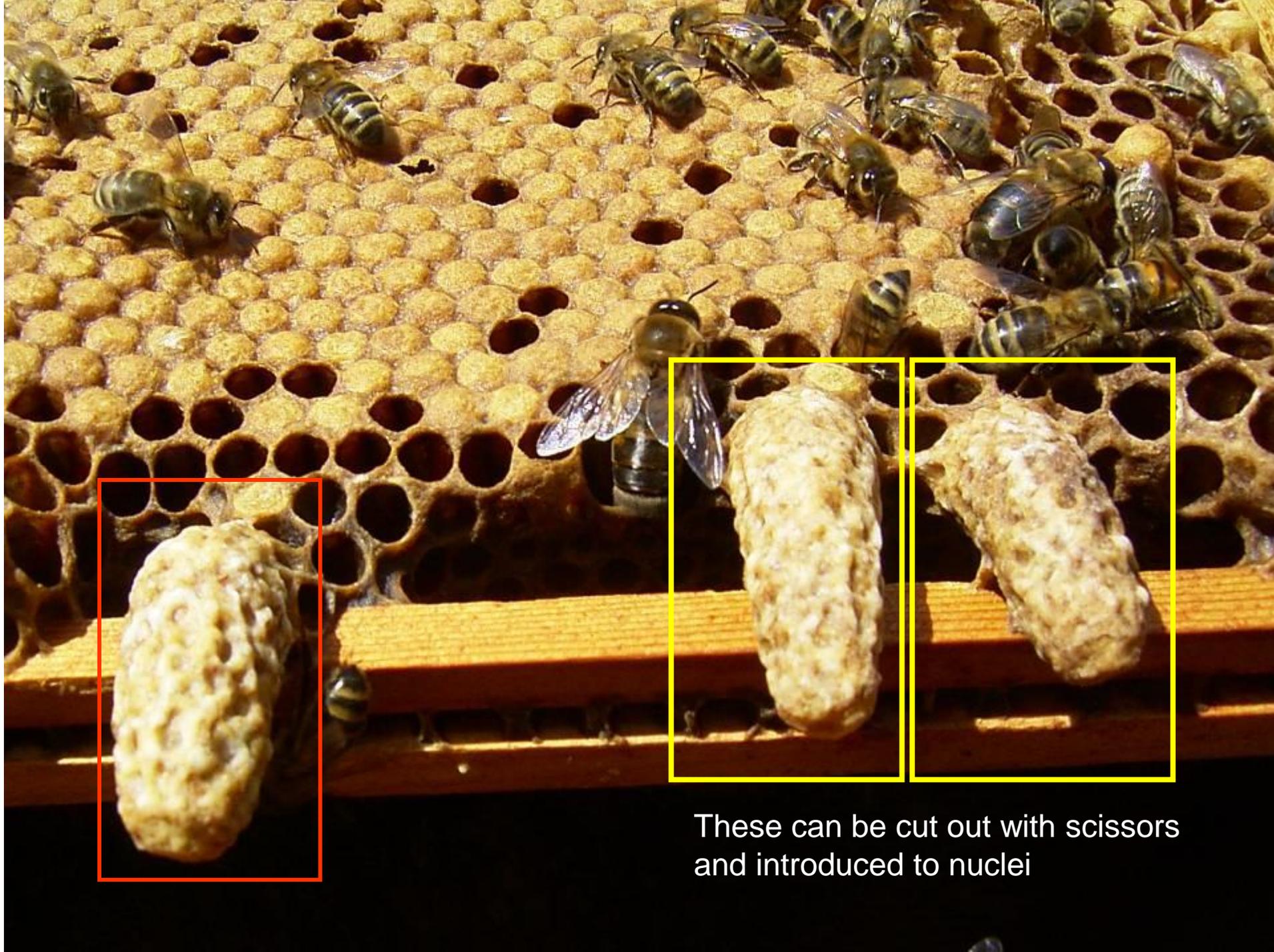




# Swarm cells

Need to transfer whole frame as cell attached to bottom bar





These can be cut out with scissors  
and introduced to nuclei

# Emergency cells produced after a large colony was de-queened



These can be cut out with scissors and introduced to nuclei

# Topic 1



## Summary

You will now:

- Appreciate the benefits of raising your own queens including stock selection principles
- Understand the general queen rearing principles, and
- Be aware that you can use naturally produced queen cells to raise queens



# Topic 2 The Miller Method



## Introduction

This topic introduces a simple method of producing 6 to 9 queens using the Miller method



# Topic 2 The Miler Method



## Learning Outcomes

Once you have completed this topic, you will :

- Be able to complete the Miller method of raising your own queens
- Appreciate that a 14 day old queen cell is the best to introduce into a nuc or mini mating hive, and
- Know how to introduce the queen cells and the importance of only inserting 1 queen cell into the nuc or mini mating hive



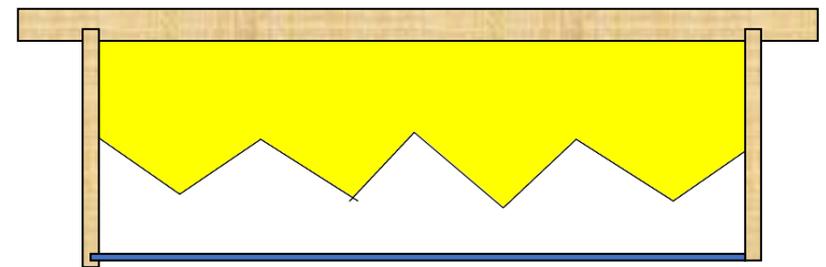
# Topic 2 'The Miller Method' of Queen Rearing (after Dr Charles C Miller 1911)

- Produces 6 – 9 queens at a time
- No special equipment is required
- It is simple and not expensive
- The method can be repeated several times a season

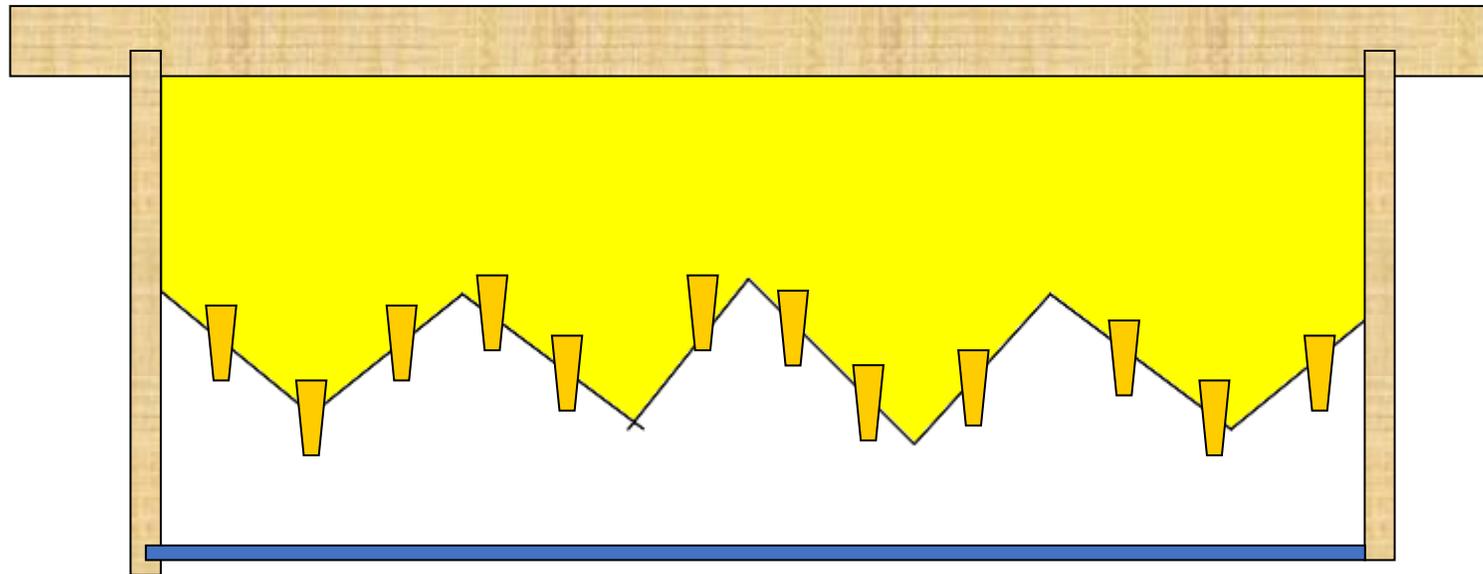


## Topic 2 The Miller Method 'General Principles'

- Shaped comb or foundation is placed in the middle of a brood box of a selected colony
- The queen lays in it and the bees extend the bottom and fill the gaps, allowing the queen to lay in the extensions a few days later
- When the eggs start to hatch it is removed from the colony, the bees removed and the comb is cut back to where the larvae are 24 - 36 hours old, i.e. 4 - 4 ½ days from the egg being laid.
- The comb is then placed in a cell raising colony and the bees build Q/Cs on the exposed edge



Produces lots of queen cells on margins  
more easily individually harvested using  
scissors



# The Miller Method



- Select the hive from which you will secure larva (the breeder colony)
- Prepare a frame of wax foundation for the bees to draw out and the queen to lay into.
  - Deep Frame with Deep foundation
  - Worker cell wax foundation, no wires

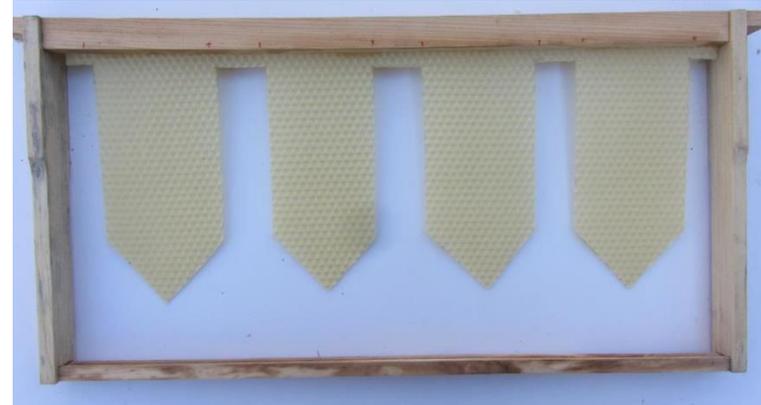


# The Miller Method



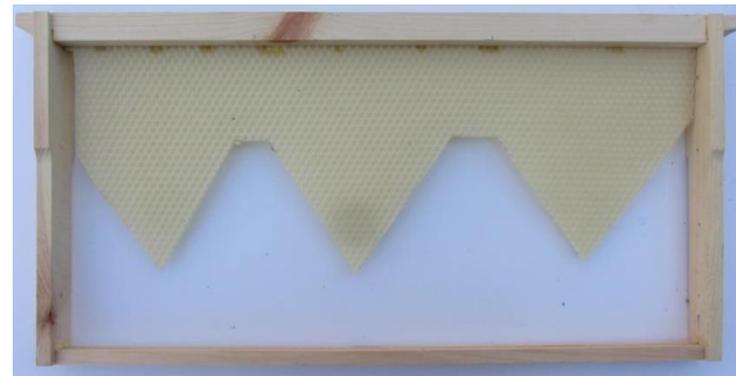
Wax Foundation ( Miller Frame)

- Strips



- Saw tooth

Both options will work



For best results use freshly drawn  
comb



Strips

Sawtooth



# The Miller Method Timetable



## Day 0

insert frame into breeder colony



# The Miller Method



- You must have a good nectar flow. If not feed a 1:1 sugar syrup to enable the bees to draw wax
- Place the Miller frame in the centre of brood nest of the selected stock hive
- The hive must sit level for wax to be drawn straight
- Record date and time



# The Miller Method Timetable



## Day +4

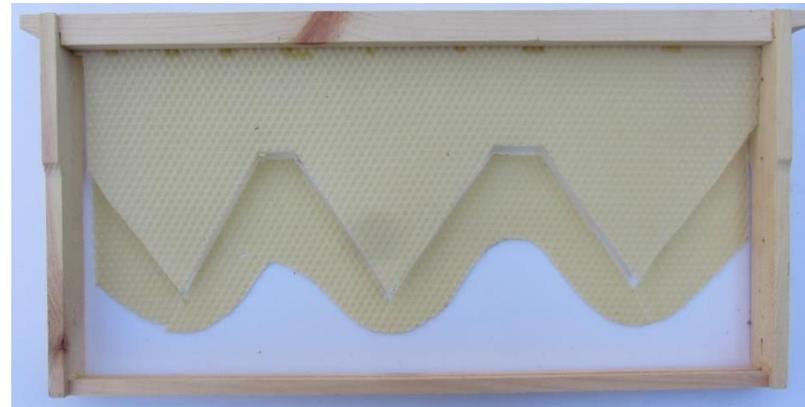
- Check frame for eggs/larvae
- Remove frame, brush off bees and cut to saw tooth shape. The bottom margins of the comb are trimmed so that the cells at the margins contain the youngest larvae (one to one and half day old)
- This should be done in a warm, shady place to protect larvae from winds and direct sunshine; the frame should not be out of the hive longer than 10 minutes. Can use a damp paper towel to cover larva & prevent drying



# The Miller Method

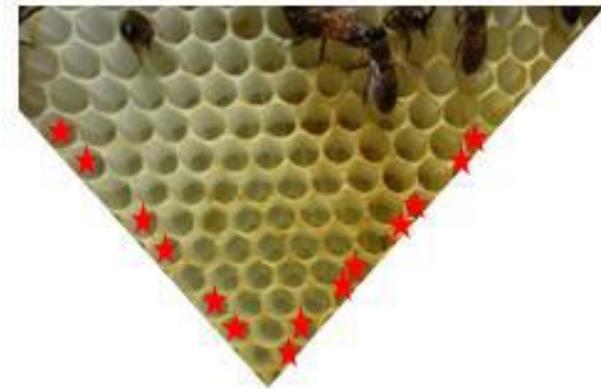


- Avoid tilting the Miller frame – the wax foundation may break free
- Trim away added comb so youngest larvae are at the edge



# The Miller Method

- After trimming, destroy every second or third larva or egg on the margin of the cut comb as this will mean the queen cells will be built farther apart and thus easier to cut out later.



# The Miller Method Timetable



## Day +4

- Insert frame into de-queened cell raiser colony
- The queen will have been removed 1 or 2 days before



# The Miller Method Timetable



**Day +6**

- Check for queen cells



2 days later queen cells are being constructed on the cut edges







**Plan  
Bee**



One week later cells are sealed





# The Miller Method Timetable



## Day +14

- The ripe Q cells are placed into queenless nucs and these are taken to a mating apiary
- Or Q cells are placed into mini mating hives with 300ml of young bees, entrance sealed and kept in a cool place inside for 3 days
- It is important that only 1 sealed queen cell is added to the nuc or mini mating hive



Harvesting  
the queen  
cells



# Cell Introduction



# Introduction of cut out queen cells into a colony de-queened the day before



Two cells shown  
for demonstration  
only  
\*Remember, only 1  
Queen cell should  
be placed into the  
nuc



# Queen Cell Protection



- Cell protector cages prevents bees tearing down q cells if introduced immediately queen is removed
- Alternative : wrap the cell in kitchen foil or tape leaving just the tip of the cell uncovered



# Apidea Mini Mating Hive



# The Miller Method Timetable



- **Day +17**
- The apideas are placed in a mating apiary, in the evening and the entrances are opened allowing the bees and the virgin queen to fly
- Leave for 3 weeks then check for eggs/brood to see if the queen has mated and is laying



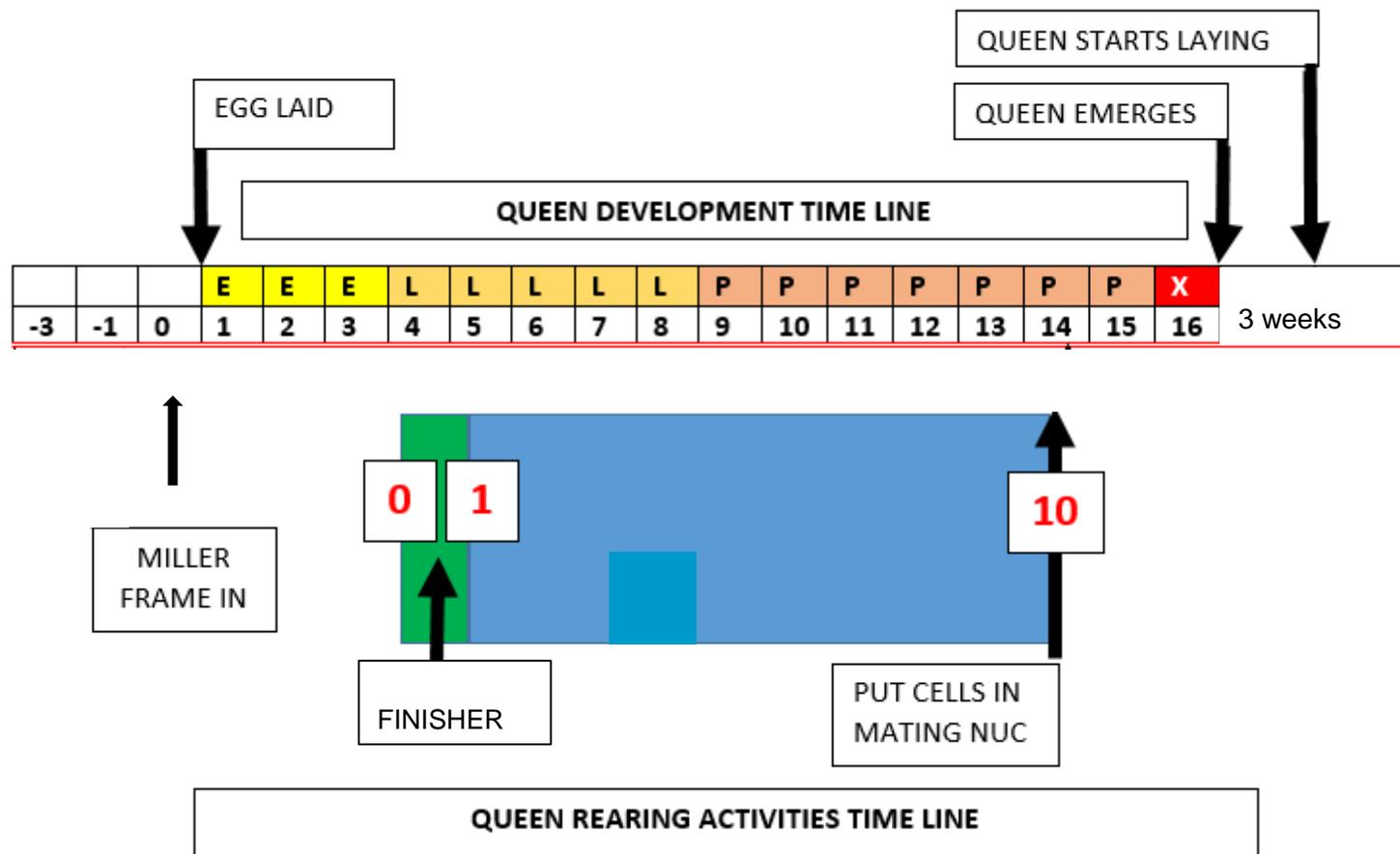
# Possible Complications with The Miller Method



- If the bees are not drawing foundation feed more or wait until there is a nectar flow
- If the bees are filling the drawn comb with nectar, move the hive to lose some of the foragers and reduce nectar intake
- If the larva has developed beyond 1 day after hatching (larger than the size of an egg), start the procedure over



# Review of Miller Method Timetable



# Topic 2



## Summary

You will now:

- Be able to complete the Miller method of raising your own queens
- Appreciate that a 14 day old queen cell is the best to introduce into a nuc or mini mating hive, and
- Know how to introduce the queen cells and the importance of only inserting 1 queen cell into the nuc or mini mating hive



# Topic 3 'Mini Mating Hives and Queen Rearing in a Queenright Colony'



## Introduction

This topic looks at the use of mini mating hives and details a queen rearing method in a queenright colony.



# Topic 3 Mini Mating Hives and Queen Rearing in a Queenright Colony



## Learning Outcomes

Once you have completed this topic, you will be able to:

- Prepare, stock, maintain and re-use mini mating nucs for queen rearing, and
- Raise queens in a queenright colony



# Mini Nucs - Types

Apidea

Warnholz (Kieler)

And many new varieties



# Mini Nucs - Overview



- For mating queens only (not for overwintering)
- Can get 3-5 queens mated in a year
- The queen is removed when there are 2 frames of sealed worker brood – they can abscond if congested!
- Carry out 7 day inspections, check stores and refill as they can starve
- Nucs can be moved easily to mating stations
- Virgin queen or a ripe queen cell may be introduced to keep the system going



# Mini Nucs

- Used solely for queen breeding/mating
- Use 2/3 1lb honey jar of wet bees (300 bees)
- Insert a ripe queen cell
- Add fondant



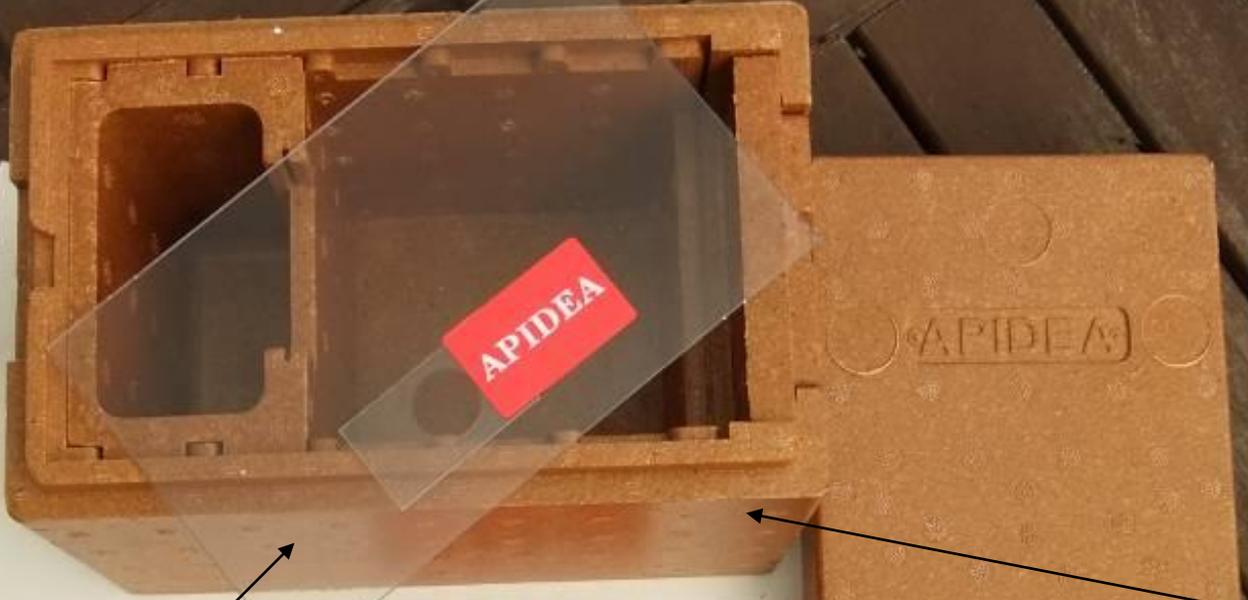
# The Apidea Kit



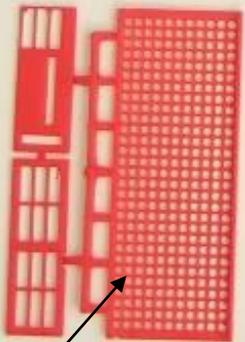
- Check contents

brood chamber with feeder roof

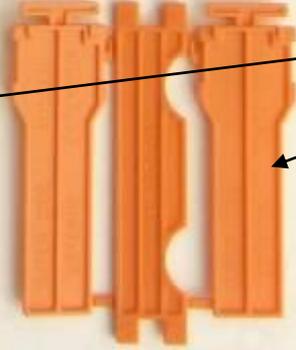
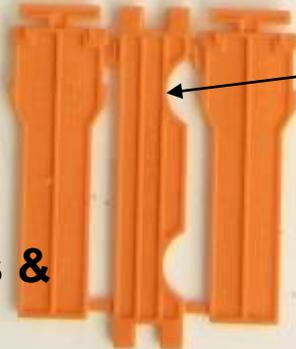
Three frames to assemble



Transparent crown board



Plastic excluders & ventilation grid





Separate the bits of plastic and assemble the frames





Attach strips of foundation using molten beeswax to secure the strip

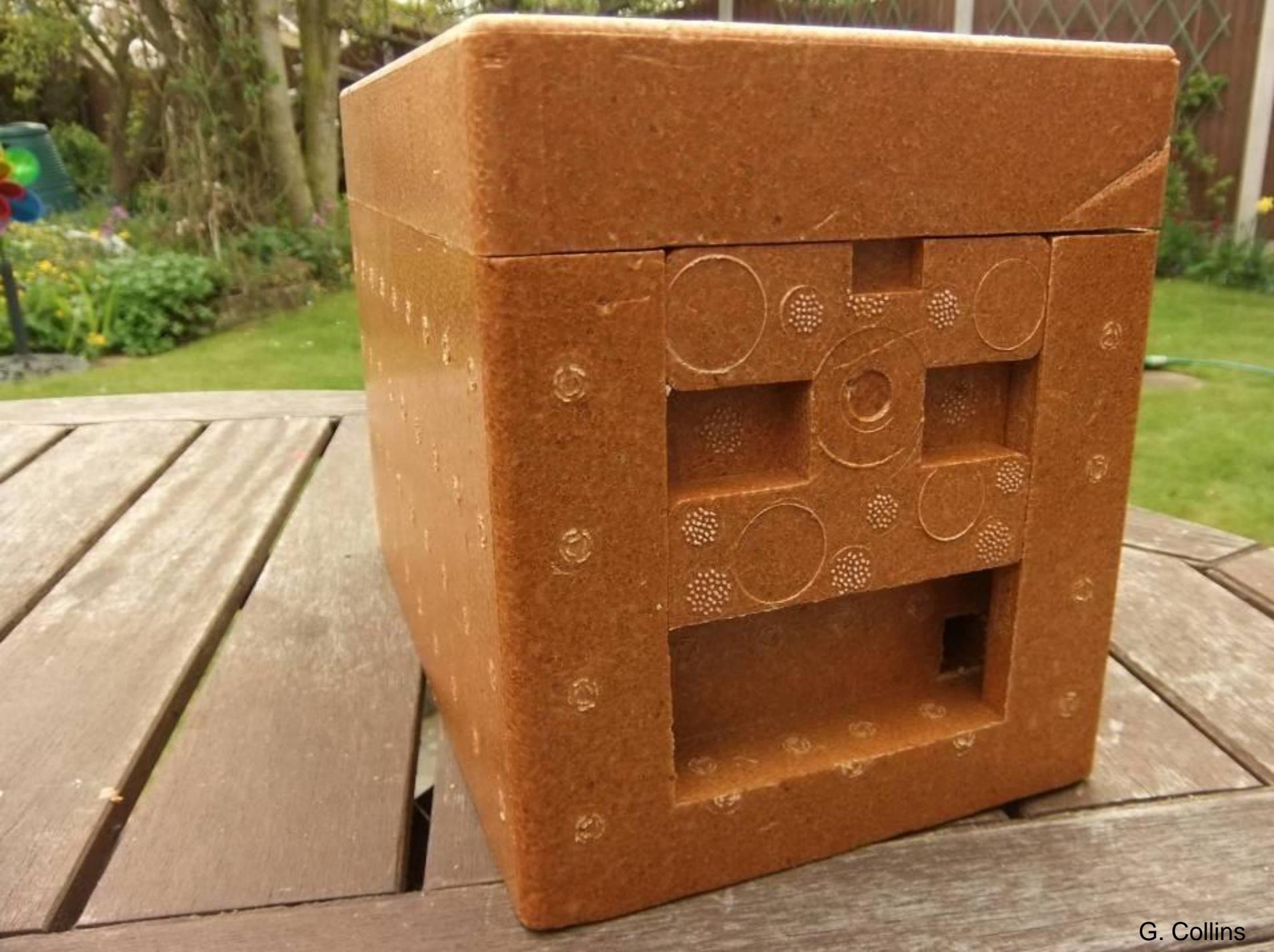




Fit q excluder in slot  
between feeder and  
frames

Q cell access  
flap should be  
over "hole"  
between two  
frames

Fit Ventilation grill in  
slot



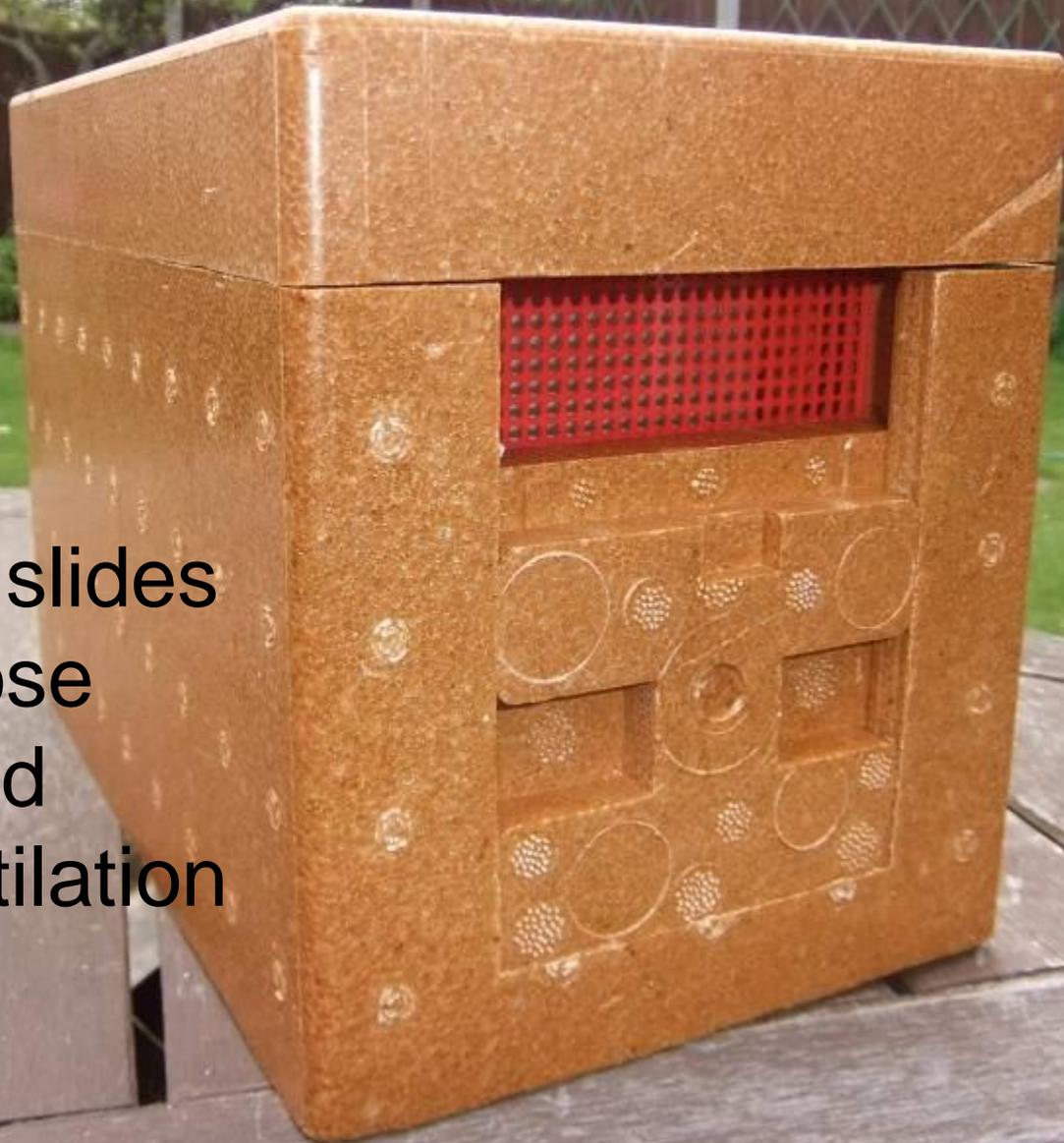


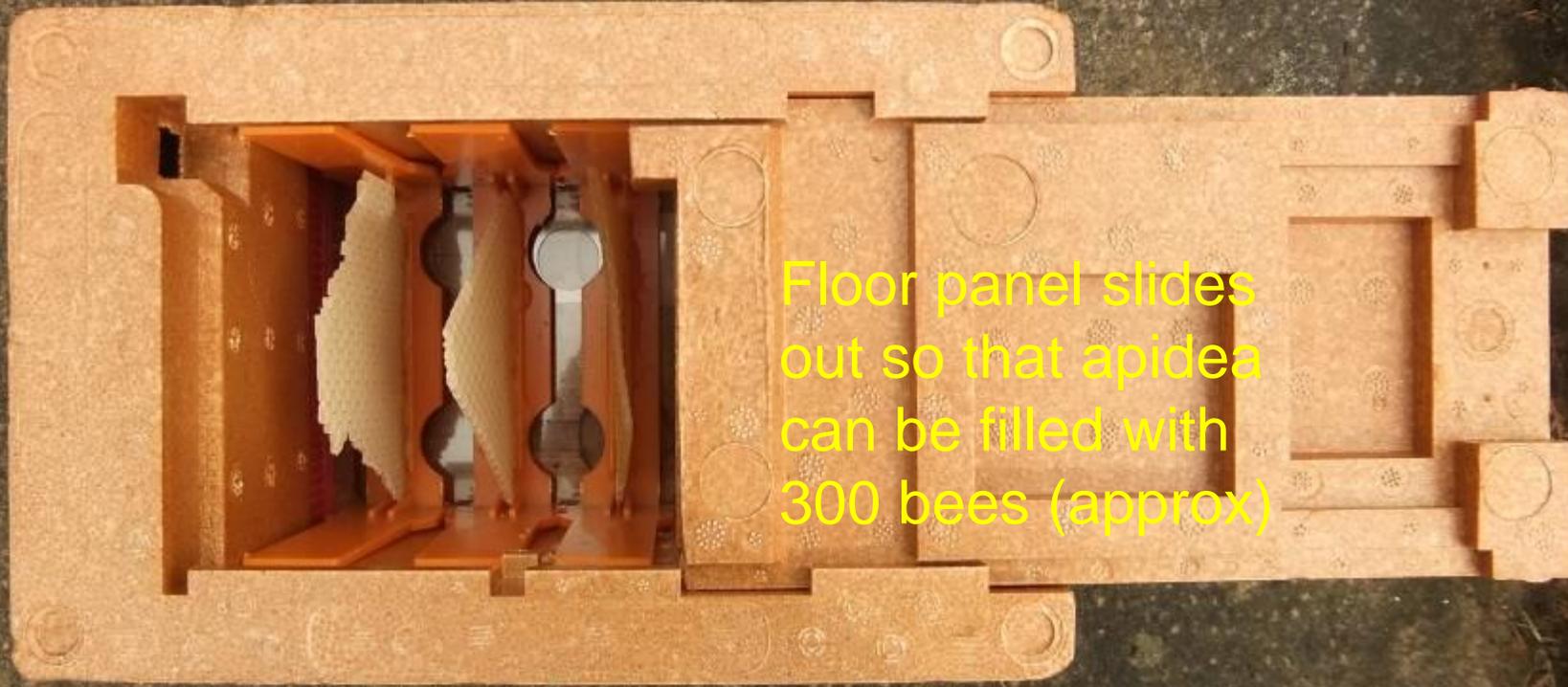
Excluder slit over entrance prevents absconding **ONLY** after queen is laying

G. Collins



Front panel slides  
down to close  
entrance and  
expose ventilation  
grill





Floor panel slides out so that apidea can be filled with 300 bees (approx)



# Feed fondant in a cut comb container





**Plan  
Bee**



**APIDEA**



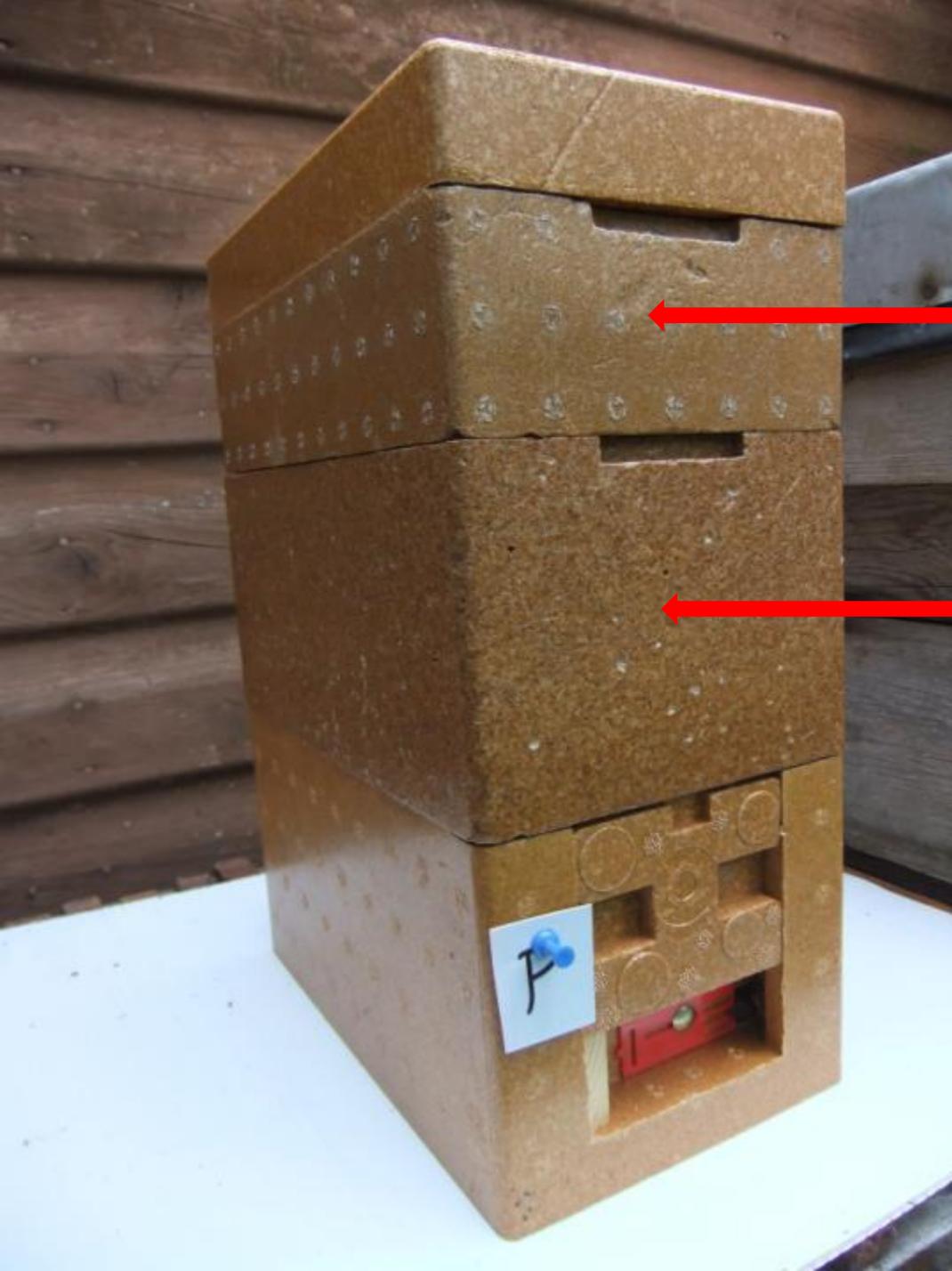
# Apidea can be expanded



Top feeder

Integral Feeder can be removed to allow the nucleus to expand onto two more frames



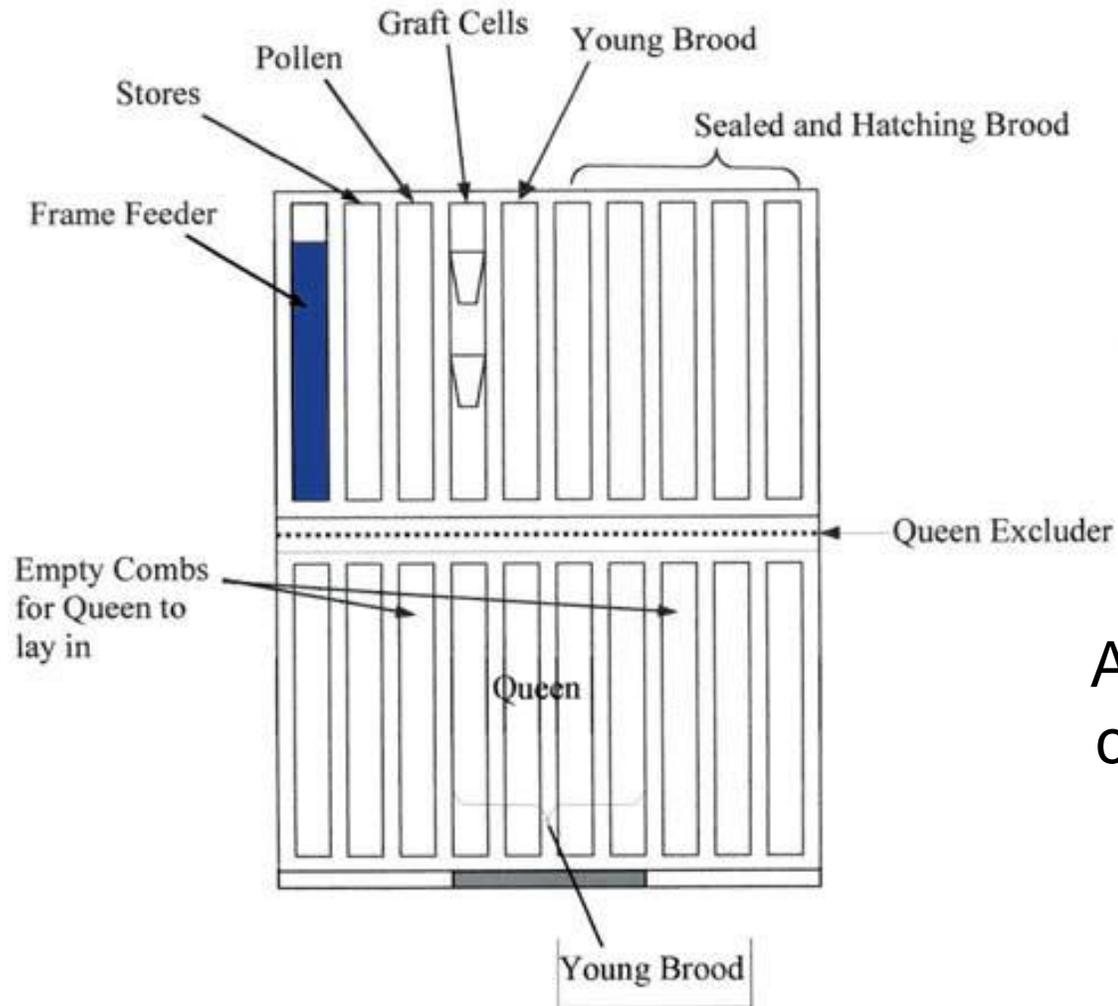


Top Feeder

Super with 5 frames



# Queen Rearing in a Queenright Colony



A large double brood colony is rearranged like this



# Queen Rearing Timetable in Scotland 2017



Tues 16<sup>th</sup> May at 5pm- re-arranged rearer colony

Day -1



Wed 17<sup>th</sup> May – Insert grafted larvae from breeder colony

Day 0



Friday 19<sup>th</sup> May – Check to see if Q cells accepted

Day +2



# 16 out of 24 Grafted Larvae Accepted





The bees are feeding the larvae royal jelly and the cell is being elongated



# Queen Rearing Timetable



Tues 23<sup>rd</sup> May– check top box & remove any Q cells the bees may have started

Day +6

Sun 28<sup>th</sup> May– Q cells inserted into mini nucs, into cool place inside

Day +11

Wed 31<sup>st</sup> May in evening – place mini nucs outside & open entrances

Day +15

Leave for 3 weeks then check for eggs/brood





Queen cells!



Distributing ripe queen cells





The ripe Q cells is inserted between 2 frames as shown





G. Collins



Q cell inserted  
and a cupful of  
bees





Shake bees off  
supers and  
spray with  
water







About 300  
bees  
needed





Open floor  
insert and  
pour bees  
into Apidea







T. Harris



For making many Apideas,  
bees are shaken from  
supers into roof

The bees are  
sprayed with water  
to prevent them  
flying



T. Harris







T. Harris

Scoop up into  
jar (2/3 full).  
300 bees



Pour bees into Apidea  
(entrance closed)



T. Harris



# Queen Rearing Timetable



Close bottom  
panel



# Queen Rearing Timetable



- Place Apideas in dark cool room for a 2 or 3 days, make sure entrances are closed
- The queens will emerge from their cells and start piping and quarking
- Place Apideas outside in the evening & open entrance
- Virgin queen will fly and mate from mini nuc
- When Q is laying well
- Introduce Q into nuc or full colony





- The bees roar!
- Mist water through ventilation grill using hand water sprayer at least once a day



Click here to hear queens piping and quarking



BBKA Course in a Case

# Mating Apiaries



T. Harris



Place mini nucs  
with entrances  
in different  
directions in a  
mating apiary



T. Harris







T. Harris





G. Collins



Queens from  
these cells  
have emerged  
OK





**Plan  
Bee**

Comb drawn and  
pollen in cells indicates  
a queen is present





When sealed  
worker brood is  
present the Q is  
ready for  
introduction to a  
full colony





G. Collins



Entrance with Q  
excluder fitted to  
stop bees and  
queen absconding  
once she is laying  
well



# Mating Apiaries - Problems

- Badgers, if a problem mount at least 3' high
- Robbing by other bees and wasps
- Wind, mating apiary needs shelter, place bricks on top
- Absconding, insert queen excluder into entrance when queen is laying
- Starvation – check stores regularly



# Queens sometime return to wrong mini nuc



# Queen cells torn down by workers

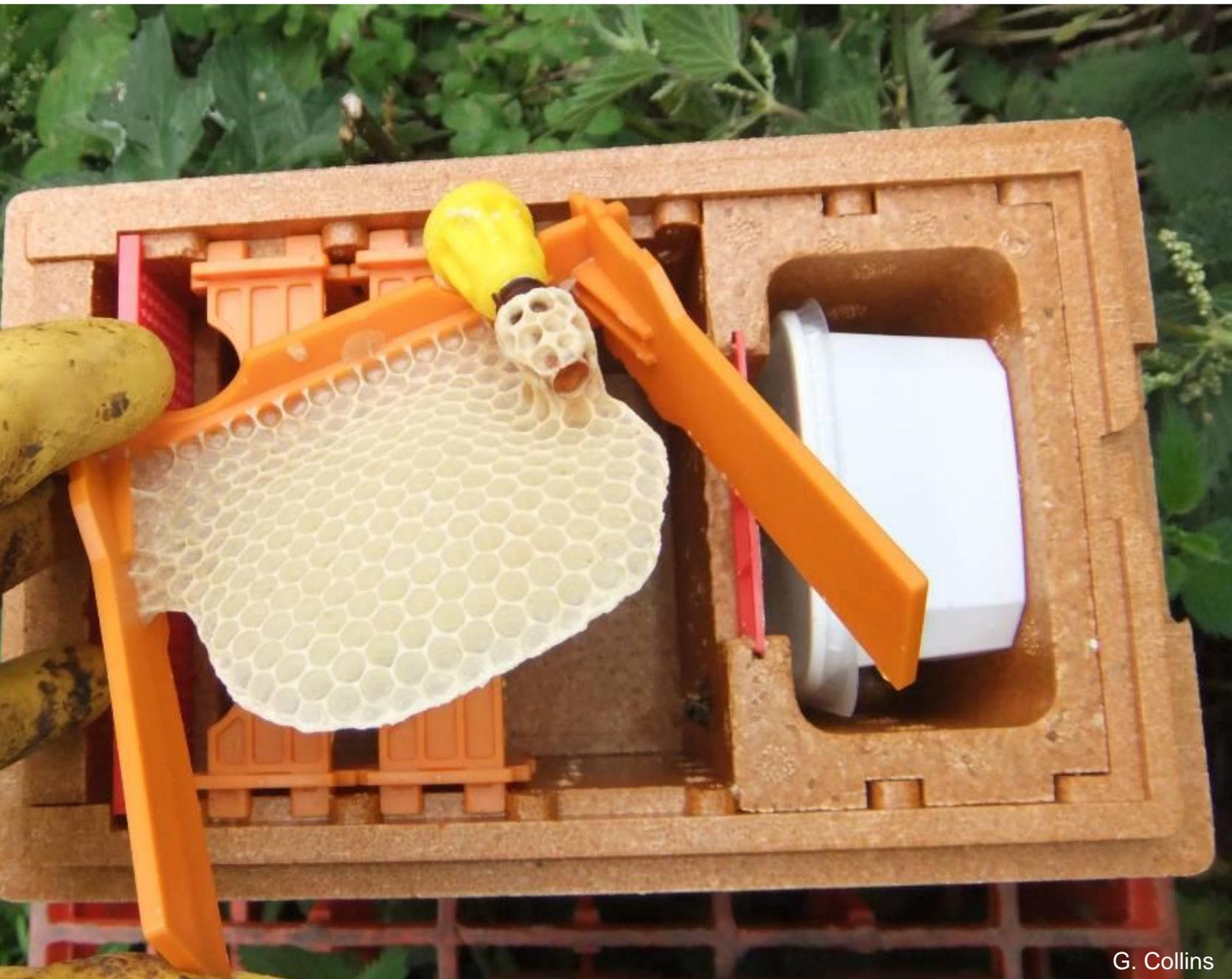


G. Collins



Can use q cell protector





G. Collins



The queen has emerged but the bees have absconded





The queen has not mated and is now laying unfertilised eggs – known as a ‘Drone Laying Queen’





Laying workers



The queen has not returned from a mating flight and laying workers have developed, evidenced by multiple eggs in cells





G. Collins



You can introduce a queen by uniting the Apidea through newspaper over feed hole in crownboard,





G. Collins



Bees chew through newspaper and bees mix peacefully

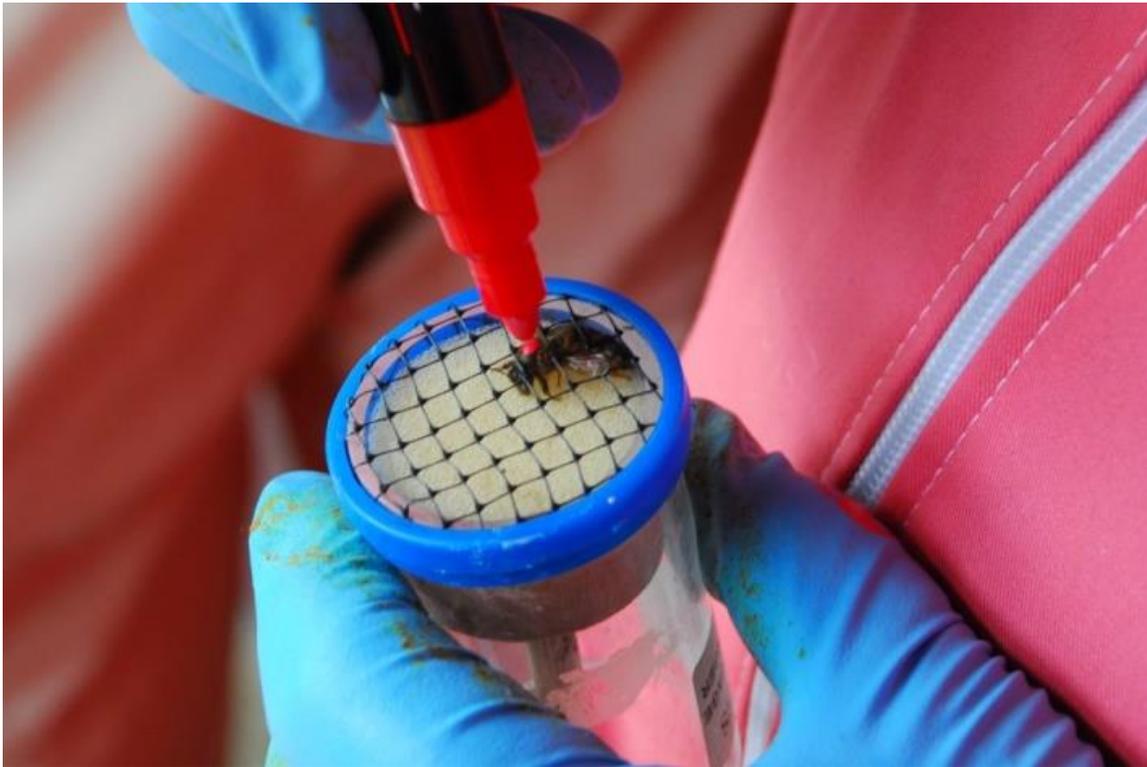




At the end of the season you can unite several Apideas over a full size hive using the newspaper method with a Queen excluder between Apideas and hive. After 21 days there will be no more brood to emerge and the Apidea frames can be removed



# Marking the Queen for Introduction to Full Sized Hive



# Caging the Queen for Introduction to Full Sized Hive



# Topic 3 Mini Mating Hives and Queen Rearing in a Queenright Colony

## Summary



You now know how to:

- Run a queen rearing system in a queenright colony
- Prepare, stock, maintain and re-use mini mating nucs



# Topic 4 'Grafting Larvae'



## Introduction

In this topic we look at how to graft larvae, a useful skill for raising many queens



# Topic 4 Grafting Larvae



## Learning Outcomes

Once you have completed this topic, you will:

- Appreciate the different types of grafting tools available,
- Be able to identify larvae of the correct age to be grafted
- Be able to graft larvae



# Topic 4 Grafting Tools



- Various grafting tools are available



# Topic 4 Grafting Tools



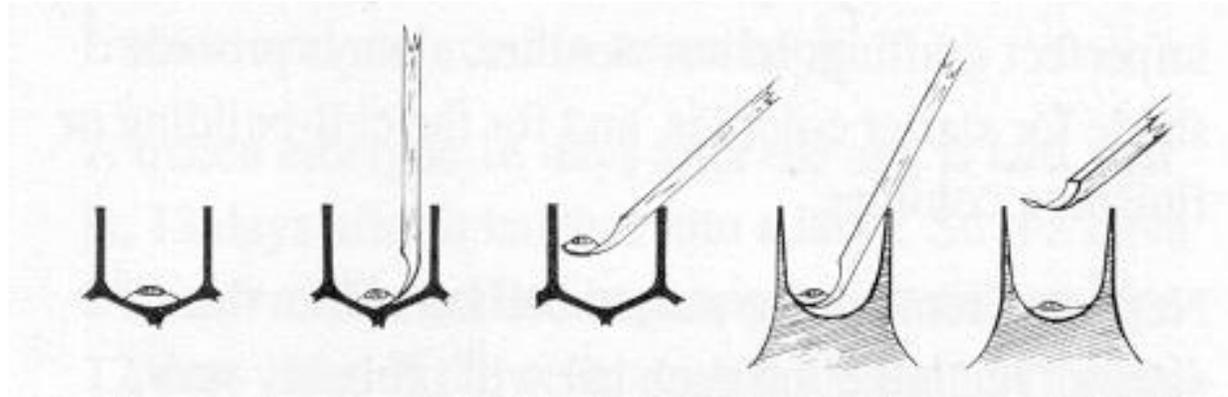
# Topic 4 'Grafting Larvae'



- Select larva 12 -24 hrs old to produce the best queens.
- These will be from your breeder colony and you simply remove the frame, minus the bees from the brood chamber
- If you need glasses wear them!
- Keep frames out of the sun and wind when grafting



# Grafting Technique



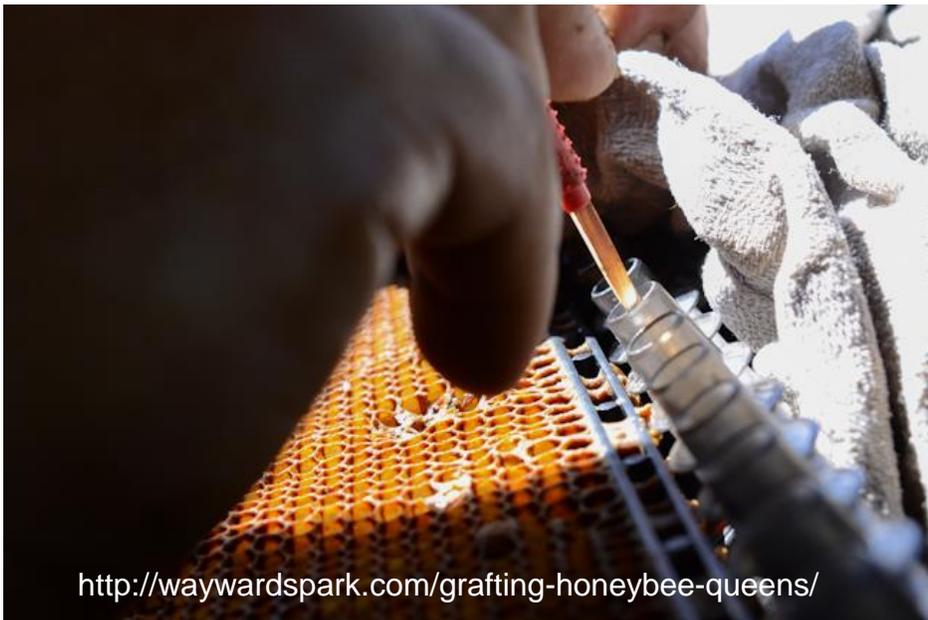
- Be very gentle with your chosen tool
- Approach the small larvae from behind its curve as it lies in the royal jelly
- Try to avoid 'rolling' the larva as this damages them and they will be rejected
- Place larva in the base of a queen cell cup



# Grafting Technique



<http://waywardspark.com/grafting-honeybee-queens/>



<http://waywardspark.com/grafting-honeybee-queens/>

- Grating using a Chinese grafting tool
- The larva is picked up on the retractable lip of the tool

# Grafting Technique



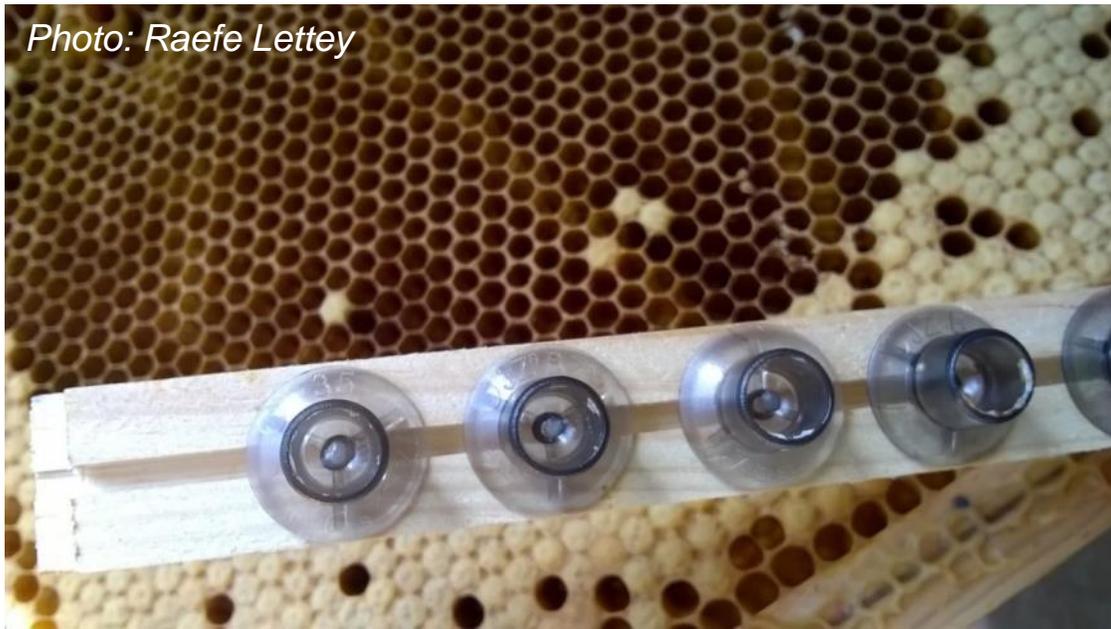
- Queen cell cups are inserted into the cell bar
- After each larva is grafted, cover the cell with your finger so you know your place



# Grafting Technique



*Photo: Raefe Lettey*



*Photo: Raefe Lettey*

- Breaking the cell walls down with a knife can allow better access to the larvae



# Grafted 2 day Larva in Plastic Cell Cup



G. Collins



# This Larva is Too Old



G. Collins



# Practice Makes Perfect!



# Topic 4 Grafting Larvae Summary



- It's not as difficult as it seems
- Have a go yourself
- Practice makes perfect!
- And it is good fun! 😊



# Topic 4 'Grafting Larvae'

## Summary

You now know how to:

- Choose suitable aged larvae for grafting
- Use a grafting tool of your choice
- Complete the grafting process



# Topic 5 Queen Handling, Marking, Clipping and Introduction



## Learning Outcomes

This topic looks at the differing methods of introducing queens to a colony and teaches the learner how to handle queens

Once you have completed this topic, you will understand:

- the optimum conditions for and different methods of introducing queens,

And be able to:

- Clip, mark and package mated queens for sale or introduction



# Topic 5 Introduction



- Queen introduction is the procedure used to provide a queen to a colony of honey bees rather than letting the natural process of queen replacement via swarming or supercedure to take place
- Successful queen introduction requires careful planning
- And the right conditions
- It is NOT infallible and there are no guarantees of success



# Topic 5 Why We Introduce Queens?



- You may have to introduce a queen for a variety of reasons, such as:
- You have a Queenless colony or a failing queen
- Aggressive bees, followers, and other behavioural problems which can be fixed with a new queen
- Diseases that may be related to the queen, such as chalk brood, acarine, nosema
- Poor hygienic behaviour
- Poor productivity
- Swarm control
- Making increase



# General Conditions, 'Ted Hooper's 'Guide to Bees and Honey'



- The Colony receiving the queen:
  - Must be queenless
  - Unexcited, and
  - Must make slow contact with the queen
- The Queen must
  - Be undisturbed, calm
  - Be hungry to solicit food from the workers
  - Have her odour masked or contact delayed



# Successful Introduction is dependent on:



- Reducing the workers' memory of their queen
- The age of the bees and population strength of the colony – young bees in a nuc accept a queen more readily than a full sized colony.
- The similarity of activity of the new queen and the previous one, i.e. replace a laying queen with a laying queen
- Eliminating the defence reaction of workers by releasing the queen slowly as they familiarise themselves with her first
- Absence of a queen or queen cells in the receiving colony



# Recipient Colony Requirements



- The recipient colony should be queenless with no queen cells being built
- The queen can be introduced in a cage:
  - Immediately, or
  - After 7 days after you have removed all queen cells as the colony will be hopelessly queenless and desperate for a queen (more successful)



# Testing for Queenlessness



- If there is no brood in the hive and you suspect it is queenless you can insert a 'Test Frame' of young larvae from another colony
- Inspect 24hrs later for emergency queen cells
- If there are no queen cells then there **IS** a queen present
- If the bees have built emergency queen cells there is NO queen
- This is an infallible test



# Introducing the Queen



- Colony must be made queenless so remove the queen. You can introduce:
- A ripe queen cell (14 days from egg laying) pushed into the brood comb
- A virgin queen that can be run in the entrance
- A mated queen in a cage



# Introducing a Mated Queen



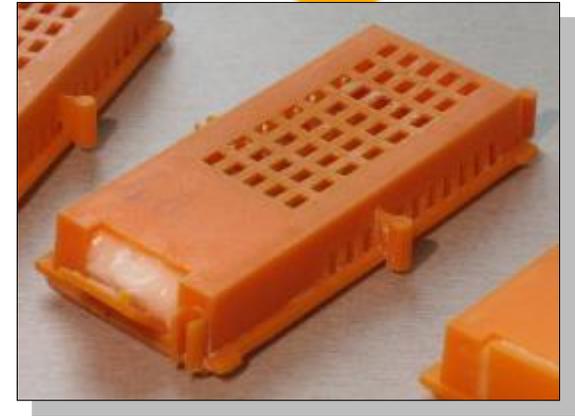
- A mated queen is usually accepted after a period of familiarisation and an introduction cage is used
- This delays the queen's release as the cage is sealed with fondant that the bees have to eat their way through
- The cage is inserted between 2 brood frames
- The bees will often kill the queen
- The safest method is to introduce the queen to a nucleus and then unite the nucleus with the full colony (after removing the old queen)



# Introducing the Queen



- You can open the exit flap to allow bees to release the queen or
- Keep the exit flap closed so that you can return and release the queen yourself
- The cage is placed in the brood chamber between 2 frames for 3 days
- You then return and check that the bees are not making queen sells. If they are, destroy them and leave the queen in the cage for another 2 days
- When no queen cells are being built, open the exit flap and allow the bees to release the queen
- Wait for 7 days and check for eggs which will indicate the introduction has been successful and the queen is laying



G. Collins



# Introducing Virgin Queens



- Young virgins are anonymous until they start producing queen substance, and are not viewed as a threat by the bees
- No familiarisation is needed and they can be run into queenless colonies via the entrance or on brood top bars
- Check after 21 days to see if the queen has mated and started laying



# Introducing Queen Cells



- Queen cells are best accepted by a de-queened colony that is raising queen cells
- You need to destroy any queen cells they are making, and
- Carefully press **ONE** ripe, sealed queen cell into the comb alongside an area of brood
- Ripe queen cells can also be introduced into a queenless nuc



# Introducing Queen Cells



Cells pushed into comb



Cell held between frames



# Queen Cell Protection



- Worker bees destroy “strange” queen cells by biting through the sides
- Using a q cell protector cage will protect the cell from destruction
- Allows immediate introduction of q cell to nuc/colony without a period of queenlessness
- Can also wrap the cell in kitchen foil or sticky tape leaving just the tip of the cell uncovered



# Torn Down Queen cells



Bees remove queen through hole in side of q cell

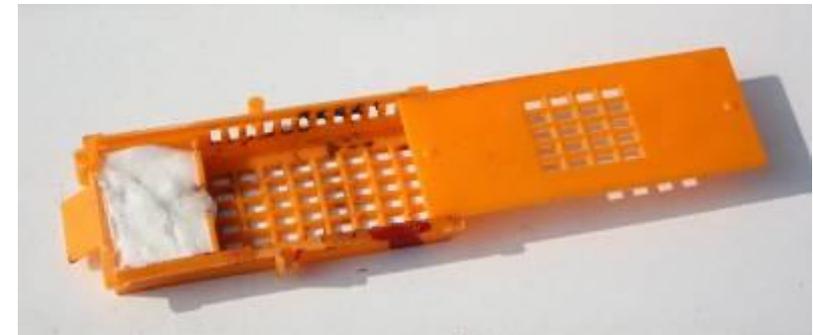
Torn down q cell



# Queen Cages



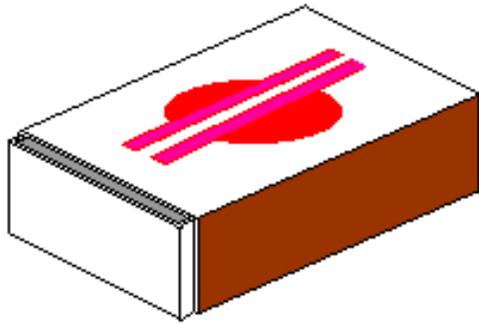
- Used to hold the queen temporarily or for introducing her to a colony
- Mesh allows bees to make contact with the queen but also gives her a hiding place in case of aggression
- Fondant delays the queen's exit
- The exit flap need to be opened by the beekeeper before the queen can be released



# Queen Cages

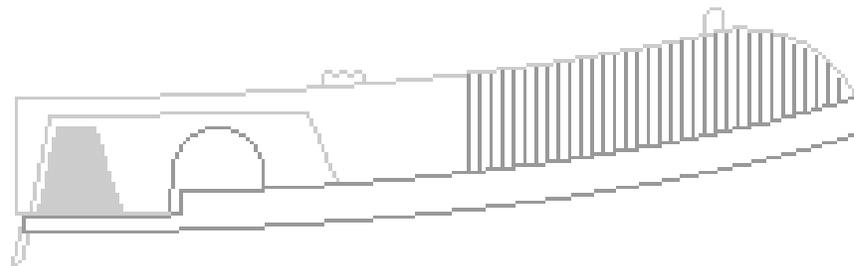


Butler cage  
(various sizes)



Match box

Queens guard cage



# Push in Cage



- This is claimed to be a safer method of introducing queens
- They have a mesh screen with openings, and there are various sizes and designs
- The cage is placed over the queen and pushed into wax comb
- The queen is released alone over emerging brood and these newly emerged bees care for the queen
- Introduction is complete when she starts laying



# Requeening with a Nucleus Colony



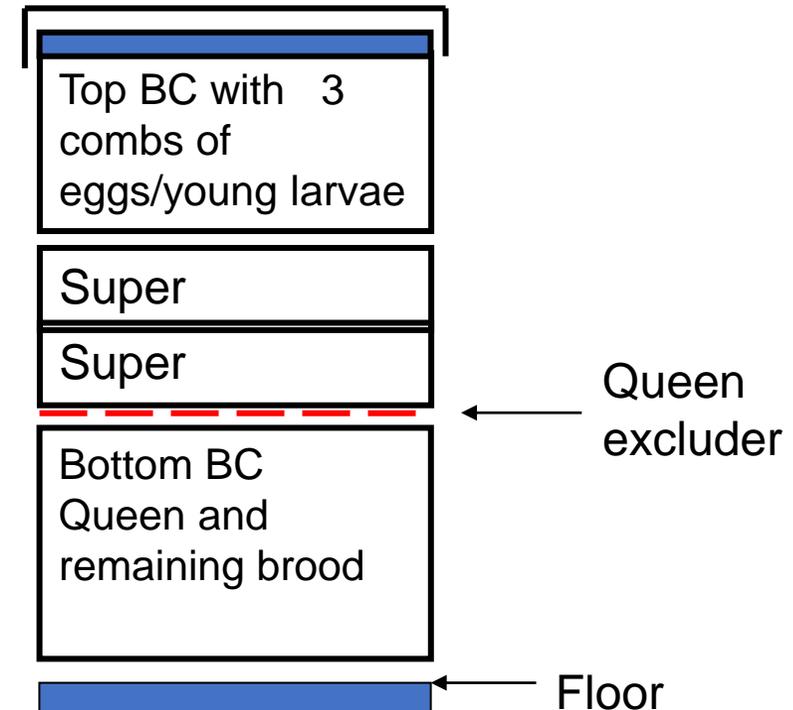
- Queens are more readily accepted in a nucleus and the success rate increases if the nuc contains young bees
- First, introduce the queen to a nucleus of young house bees
- Place queen in cage and insert between 2 frames of brood
- When queen is accepted and laying, unite the nuc to the large colony to be requeened using the newspaper method
- This is a safer method when introducing an expensive queen



# Making a Nuc of Young House Bees



- This is a very safe method as young house bees are not aggressive
- There is no need to find the queen
- Remove 3 frames containing brood, pollen and honey and shake or brush all the bees back into the brood chamber
- Place the frames in new brood chamber, brood in centre
- Place the queen excluder over original brood chamber



# Making a Nuc of Young House Bees



- Any supers are then placed over the queen excluder and original brood chamber
- Place the new brood chamber on top and close hive
- After about 1 hour the nurse bees will move into top box to care for the brood
- You simply remove the box and transfer the frames and bees into a nuc box and add a frame or two of stores
- Add a mated queen, ripe queen cell or virgin queen
- Leave alone for 1 week if a mated queen and 3 weeks if a ripe queen cell or virgin was added



# Introducing a Queen Received in the Post



- The queen will be in a cage with a number of attendant worker bees and will be off lay
- A few days before the queen is due, make up a 3 frame nuc of young house bees from the colony to be re-queened
- Close the nuc entrance with sappy grass
- Position nuc next to receiving colony
- Feed with the nuc with fondant after a couple of days



# Caring for the Caged Queen and Workers



- Introduce queen to nuc asap
- If you have to wait a few days, add a drop of water to queen cage daily
- Store the cage in the dark at a minimum of 22C, 40% humidity level if possible
- Make sure you remove any started queen cells from the nuc
- There is no need to remove the attendant workers from the cage
- Insert the queen cage to the nucs as previously described



# Queen Handling



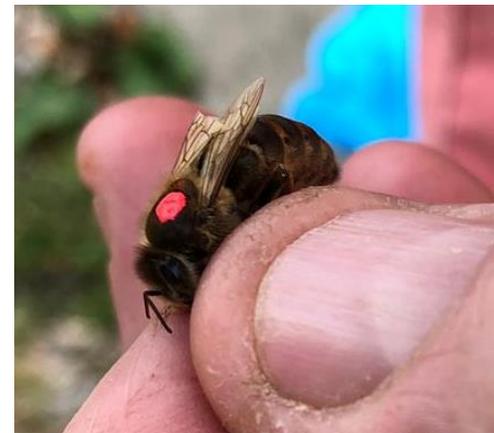
- Queens are tougher than you think!
- Many manipulations require the queen to be removed
- It is easier than you think
- Queens only sting other queens and won't sting you



# Why Should You be able to pick up the Queen?



- Many manipulations require you to remove the queen, e.g. swarm control
- You can keep her safe during inspections by placing her in a cage
- To clip & mark her
- To cage her for introduction to another colony or for posting



# Holding the Frame against the Chest



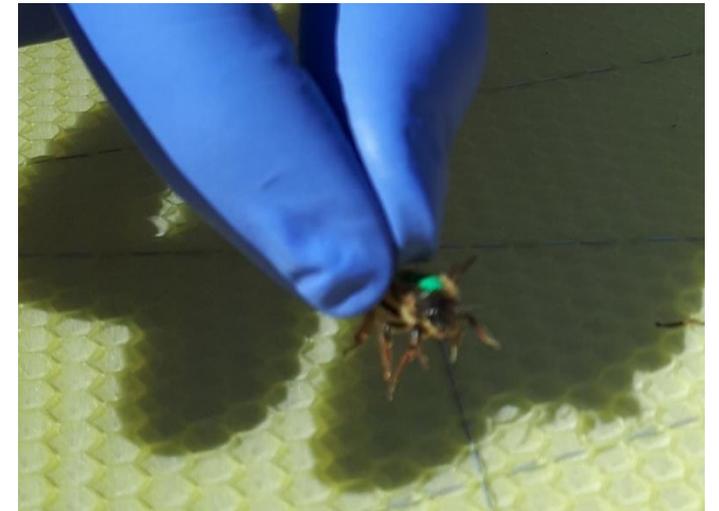
Once the queen has been spotted, holding the frame this way allows you to pick up the queen



# Picking Up Queens (if right-handed)



- Use your right hand
- Approach the queen from behind
- Immobilise the queen on the comb by pressing gently on her thorax
- Clasp both wings with finger and thumb and lift her off the frame



# Picking Up Queens (if right-handed)



- Transfer her to tip of 1<sup>st</sup> finger on your left hand
- She will grip the finger, then use thumb to trap her legs (at least 2)
- OR, Hold her by the thorax with thumb, 1<sup>st</sup> & 2<sup>nd</sup> finger
- Be firm but gentle and ensure the antennae are free



# Marking Queens



- Many manipulations require the queen to be removed so if you mark the queen she is easier to spot
- Mark her early in season when she will be easier to find
- Can use Posca paint pens or
- Humbrol enamel paint & matchstick



# Marking Queens



Test the pen before applying as it sometimes flows out too quickly and can flood over the queen

# Marking Queens



Apply a dot of paint on her thorax and allow to dry

# Clipping Queens



- A queen with a clipped wing can't fly with the swarm so the bees return to the hive
- The colony can't then successfully swarm until the first virgin queen emerges
- This allows you a longer time interval (14 days) between colony inspections during the swarming season.
- Clipping queens' wings does **NOT** prevent swarming



# Clipping Queens



- Clip 1/3 of one side of forewing (the BIG one)
- Bring scissors in from the side to avoid stabbing the queen
- Pause before cutting as queens often raise a leg





# Caging the Queen with Workers



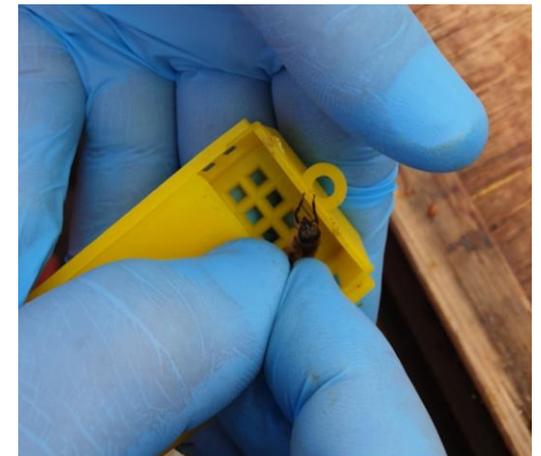
- If we add 5 or 6 attendant workers to the queen in the cage they will care for her in transit
- This has a practical use as you may wish to post the queen to a customer
- We use the 'thumb roll' method



# Caging the Queen with Workers (if right handed)



1. Hold cage in left hand
2. Lid open ~ cover gap with thumb
3. Roll thumb up to expose gap
4. Roll thumb down to cover gap
5. Add Queen first
6. Then choose 6 stationery workers from comb
7. Grasp the workers wings and lift
8. Place into cage 'bottom' first



# Topic 5 'Queen Handling, Marking, Clipping and Introduction'



## Summary

You now know the optimum conditions for introducing a new queen to a colony, are aware of the different methods available and have been shown how to pick up, mark and clip a queen safely. You will need to practice this technique on drones at the hive.



# Topic 5



## References

### Acknowledgements

*Scottish Beekeepers Association*

*COLOSS [www.coloss.org](http://www.coloss.org)*

*John Caldeira, Dallas [www.outdoorplace.org](http://www.outdoorplace.org)*

*Messrs Thorne of Wragby – [www.thorne.co.uk](http://www.thorne.co.uk)*

*Messrs Paynes Poly Nucs*

*[www.waywardspark.com](http://www.waywardspark.com)*

*Dave Cushman web site*

*[Glen-apiaries.com](http://Glen-apiaries.com)*

*Mike Brown at The National Bee Unit*

*Rafe Lettey's photographs*

*Adam Leach's photographs*

*Alastair Welch's photographs*

*National Bee unit (APHA)*

A special thank you to Gerry Collins NDB  
for use of his photographs



# Congratulations!

## You have completed Module 9

*This project has been funded with support from the European Commission. This communication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.*



Co-funded by the  
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