This presentation is part of a suite developed by the Scottish Government and SRUC to provide local associations advice and information on statutory beekeeping requirements, best practice, and how the Scottish Government provides support to Scottish beekeepers.

Managing Varroa

This is such a large topic you may want to split this into more than one talk. This PowerPoint is designed to compliment the Scottish Varroa Learning package

AIMS

We as a team aim to:-

1. Provide **education** on varroa including – recognition, biology, impact, monitoring, control/ treatments, medicine records, BeeBase registration

2. Provide **advice and support** for beekeepers on varroa

We are always looking at new information and evidence to give beekeepers examples of best practice with regards to Varroa.



Varroa

These pictures show varroa. The first picture shows there is a very heavy infestation on the larvae, and in picture 2 shows the underside of the bee where they often hide.

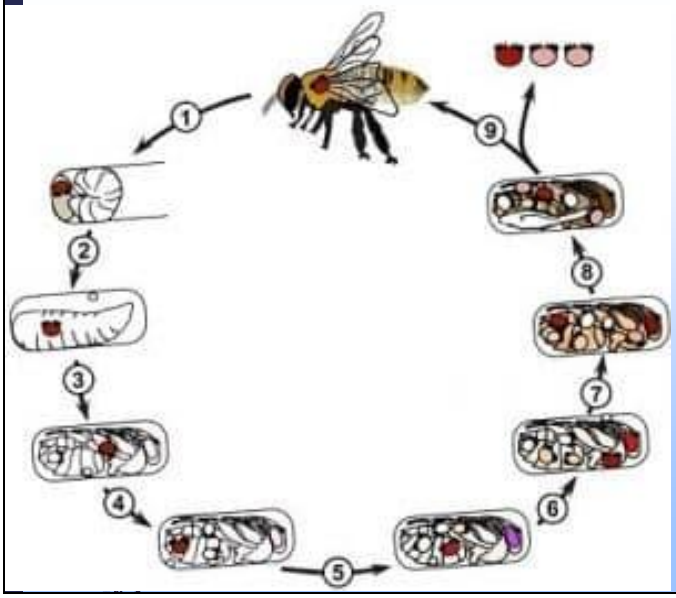
Mites enter larval cells when the larva has stretched out, immediately prior to cell sealing. How many varroa are on the third picture?

Varroa destructor

- Varroa - parasite that feeds on fat bodies and haemolymph
- It feeds on the brood and adult bees
- Adult female mite enters before the cell is capped
- She feeds on the immature bee and lays eggs
- Female is oval, brown/red, 8 legs

It is the female mite that does the damage to bees.

Varroa lifecycle



During the summer, female varroa mites may live for 2-3 months.
This means the mite load will increase during this time.
When brood is present the average lifespan of a varroa mite is 27 days.
During the summer, one mite can complete 2-4 breeding cycles.

Monitoring For Varroa

It is important to monitor for varroa so you know when, if and how you may want to treat. There are many different methods of monitoring. This shows a varroa floor and beekeepers doing an average mite count.

Why we need to manage numbers

- If Mite numbers are low, there is no obvious damaging effect on the colony
- Mite populations will increase rapidly if not properly managed.
- 1000 + will cause colony damage depending on the size of the hive.
- Colonies then lose social organisation and collapse
- Monitor at least 4 times a year

It is important to monitor your varroa levels, so you know the infestation level of your hives are and when and how to treat your hives.

You must know approximately how many varroa are in your colony so you know whether you should treat or not. When discussing monitoring varroa by counting, we are referring to counting adult female varroa only. You should aim to keep the mite population below 1000 mites to avoid serious damage to the colony.

Monitoring –Natural drop

- Use mesh floors and varroa boards
- High winds–secure floor!
- Can use Vaseline for windy sites
- Check and clear the boards regularly

- Natural drop is measured in mites/day
- (above10/day = bad)
- 1-2 a week drop indicates good control
- This method can be misleading due to under counting if the hive is actively rearing brood.

You can monitor mite drop by placing a sticky board under an open mesh floor for seven days. Remove the board after seven days and count the number of mites. You may need to spread the debris out on a white surface and use a magnifying glass to spot all the mites. Calculate your daily mite drop by dividing the total number of mites by seven. Generally speaking, the average daily mite drop should not be more than ten as this indicates a serious mite infestation and treatment is urgently needed, while below four is considered manageable, this depends on the time of the year.

Varroa – Impact and issues

Here we will look at the impact and other issues varroa has on our bees.

Varroa, Viruses and other pathogens

- Bee viruses can be naturally present in the bee population at a low level without causing significant harm
- As varroa feed they take essential nourishment away from the developing bee
- The mite, acting as a vector, can aid virus spread

Varroa weakens the bees in the hive and as you all know when we are weakened, we become more susceptible to other diseases , infections and health problems. We may think the bees have expired for other reasons but perhaps varroa is the initial cause.

(PMS) Parasitic Mite Syndrome

AKA Varroosis Colony failure due to mite overload.

- Uneven brood pattern
- capped cells with chewed holes
- neglected larvae
- emerging bees dead in cells with tongues extended/ heads chewed off
- many mites fall out when frame 'knocked'
- adult bees with deformed wings

There are many bee viruses that are naturally present at a low level in honey bees that do not normally cause significant harm. When Varroa feeds, as well as taking essential nourishment away from the developing bee, it acts as a vector for transmission of viruses, especially DWV. As colonies become more heavily infested with mites, levels of DWV increase. At high levels, DWV kills pupae and causes developmental defects in adult bees. Due to the loss of pupae, an uneven, ‘pepperpot’ brood pattern will occur. As brood dies, there may be an insufficient number of young bees coming through to tend the brood, so neglected brood may become apparent. There may also be a lack of eggs and early brood stages. Together, high levels of Varroa and DWV can result in a colony-level condition called ‘parasitic mite syndrome’. This condition signifies the terminal decline of the colony.

The signs of Varroosis / Parasitic mite Syndrome

General signs of varroosis:

- Mites visible on adult bee or on combs
- Deformed Wing disease are symptoms apparent
- Stunted, deformed young adult bees
- Mites visible on pupae (uncapping fork)
- Mites in hive floor debris.

Small numbers of Varroa mites in a colony will usually cause no obvious harm. However, as the level of infestation rises, the risk of harmful effects also rises. In colonies where the infestation is increasing, signs of damage to the entire colony will become evident. Severe infestation slows the replacement of old adult bees with healthy young bees and may lead to the rapid spread of DWV in the colony. At this stage, the normal processes of foraging, brood rearing and colony defense diminish, and the colony begins to deteriorate — a process known as colony collapse.

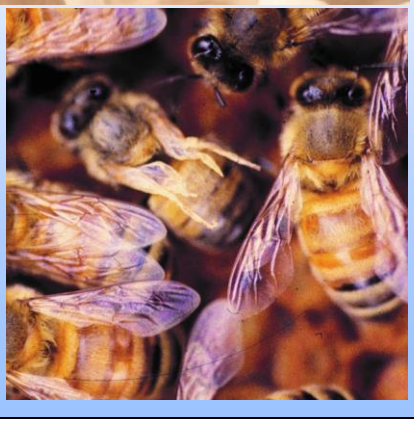
Deformed Wing Virus (DWV)

The main contributor to winter losses is:

- They reduce the lifespan of infected bees

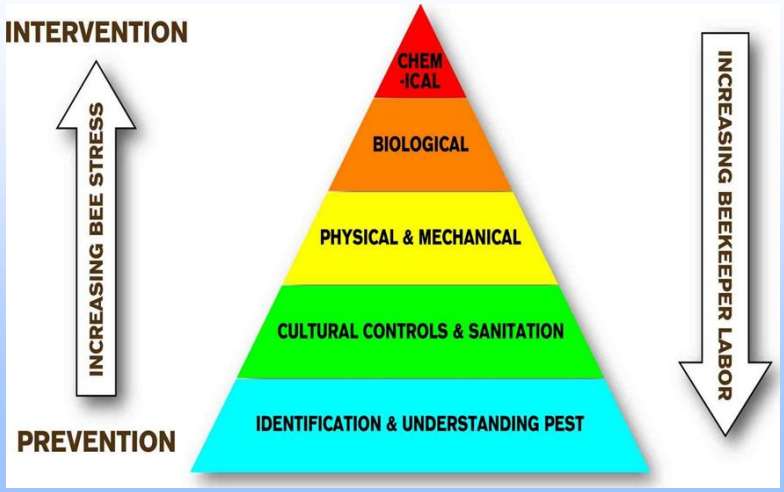
Then you will see:-

- Disrupts wing development
- Wings shredded or 'burnt'
- Bees unable to fly
- Ejected from hive
- Weakened colony

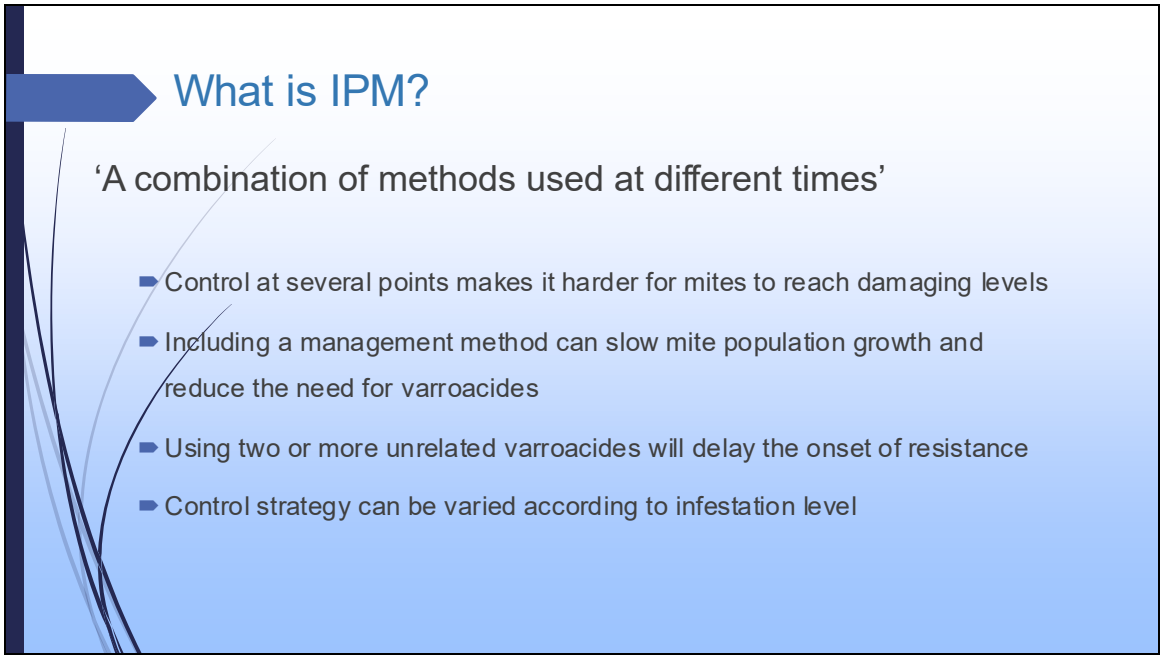


Several variants known pre-varroa It is spread by feeding - minor impact
Varroa mites inject virus into larvae. Super variant dominates- major impact
New strains are becoming more virulent
'A' 'original' strain mostly replaced by 'B' and 'C'
Drones are affected first/most due to varroa preference

Integrated Pest Management (IPM)



It is best practice to use Integrated Pest Management as part of varroa control, otherwise known as IPM for short. The best miticides are well tolerated and the stress of not treating the bees is often underestimated.



Integrated Pest Management ('IPM') is a principle where a combination of biotechnical and chemical techniques are used. No attempt is made to completely eradicate varroa. The aim is to keep the mites below the level at which they cause A beekeeper can do this by using a combination of controls applied at different times of the year.

Biotechnical Methods

Use of these methods alone is unlikely to keep mite levels at a manageable level.

Biotechnical Methods

- Regulation-free, 'Organic'
- ...but potentially less effective
- … and more labour intensive
- Open-mesh Floors
- Drone uncapping
- Queen trapping
- Shook swarm

Use of these methods alone is unlikely to keep mite levels at a manageable level. More information on these methods and swarm control can be found in the Scottish Varroa Booklet

Managing Varroa
Chemical controls

This section will advise on treatments for varroa

Updated list can be found here and at the end Product Information Database - Currently authorised product

Please refer to the Varroa in Scotland Booklet for more detail

Table 1: Varroacides authorised for use in honey bee colonies in the United Kingdom

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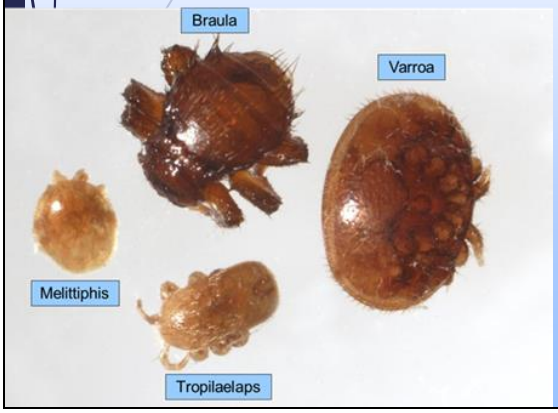
Name	Active ingredient	Mode of application	When to apply	Significant features
Apiguard (Vita Europe)	Thymol	Place open tray above brood nest	Spring or late summer; for 14 days (repeat x1)	Ensure OMFs are closed. Most effective when outside temp >15°C
Apilife Var (Chemicals LAIF)	Thymol	Break tablet into 4 pieces and place in corners of the brood box	Spring or late summer; for 7 to 10 days (repeat x1)	Ensure OMFs are closed. Most effective when outside temp >15°C
Thymovar (Andermatt BioVet)	Thymol	Cut one strip into two and place on top bars of frames but not above brood nest	Spring or late summer; for 3 to 4 weeks (repeat x1)	Ensure OMFs are closed. Most effective when outside temp >15°C
Formic pro (NOD Apiaries)	Formic acid	Place strips on top bars near the outer edges of the brood nest	May to August	Ensure colony is well ventilated and contains >6 frames of bees. Do not use when outside temps exceed 30°C
Api-Bioxal (Chemicals LAIF)	Oxalic acid	Trickling: 5ml per frame space of bees Sublimation: Use 2.3 g	Winter & broodless periods	Lethal to open brood. Ensure outside temp is over 3°C. Very effective
Oxuvar (Andermatt BioVet)	Oxalic acid	Trickling: 5ml per frame space of bees Spraying: 4 to 5 sprays per side of frame	Winter & broodless periods	Lethal to open brood. Ensure outside temp is over 3°C. Very effective
OxyBee (Veto Pharma)	Oxalic acid	Trickling: 5ml per frame space of bees	Winter & broodless periods	Lethal to open brood. Ensure outside temp is over 3°C. Very effective
DANY's Bienenwohl powder (DANY Bienenwohl GmbH)	Oxalic acid	Trickling: 5ml per frame space of bees	Winter & broodless periods	Lethal to open brood. Ensure outside temp is over 3°C. Very effective
VarroMed (BeeVital)	Formic acid and oxalic acid	Trickle between brood frames; 5 ml per frame space	Spring, autumn or winter	Ensure outside temp is over 3°C
Apivar (Veto Pharma)	Amitraz	Place plastic strips between frames close to the cluster, but more than 2 frames apart	Any season for 6 to 10 weeks, but not during honey flow	Most effective when less than 2 frames of brood and at >10°C
Apistan (Vita Europe)	Tau-fluvalinate	Place one strip between frames 3 & 4, and the other between frames 7 & 8	Autumn or early spring; for 6 to 8 weeks	Should only be used once every 3 to 5 years
Apitraz (Laboratorios Calier)	Amitraz	Place plastic strips between frames more than 2 frames apart	Autumn or early spring; for 6 to 10 weeks	Most effective when less than 2 frames of brood and at >10°C

This is from the BeeBase Managing Varroa booklet. The information is correct as of 22/4/25. This that list is subject to change. See VMD website for up to date product list. Varroxal is a new approved product as of 2025.

Good husbandry



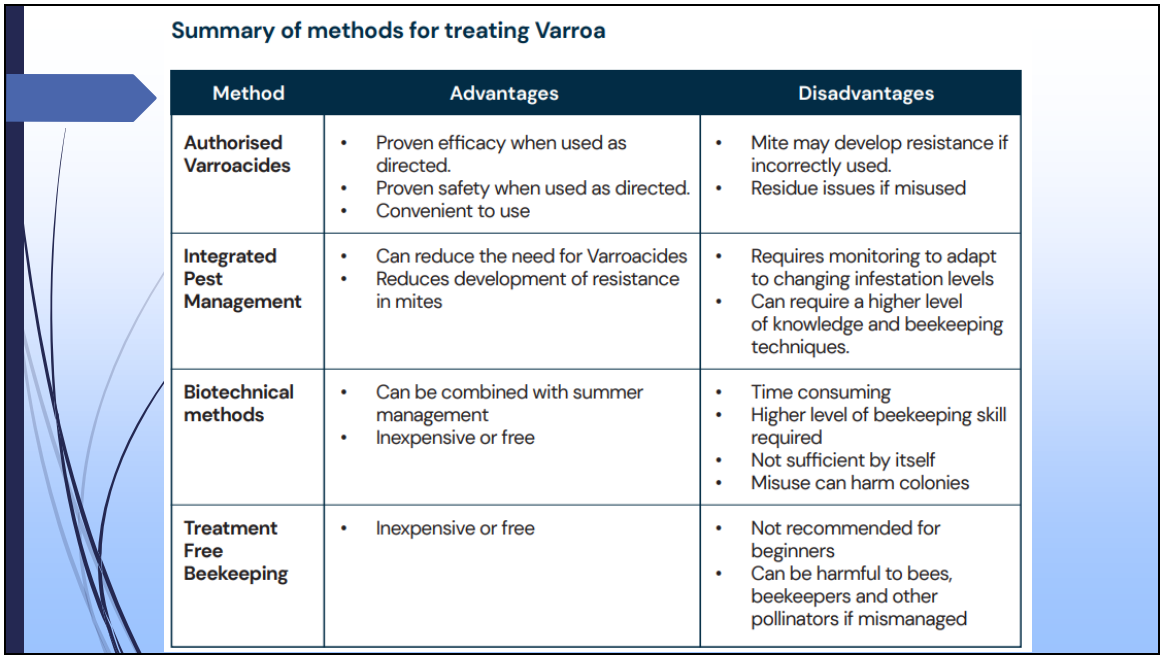
- Good husbandry should be the starting point for managing varroa or – if varroa-free - preventing the spread.
- The health of your bees is important. Make sure you can recognise the signs of *v*arroa infestation and monitor Varroa levels at different times of the year.
- Minimize the effects of robbing and drifting and keep the hives well-spaced with entrances facing in a range of directions.
- The aim is to keep strong colonies.

Best practice is key to keeping varroa under control. Do not take bees from the mainland to varroa free areas, monitoring is keep and treatment if necessary.
If beekeepers mismanage their bees it can result in swarming, spreading disease to other beekeepers and the loss of their bees

Example IPM strategy

Control	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Open mesh floor												
Drone brood removal												
Comb trapping												
Queen comb Trapping												
Formic acid												
Apiguard Api life var							Temp dependant					
Amitraz												
Oxalic Acid												

Remember weather and climate in Scotland is very different to other parts of the country and this should be taken into account when making plans

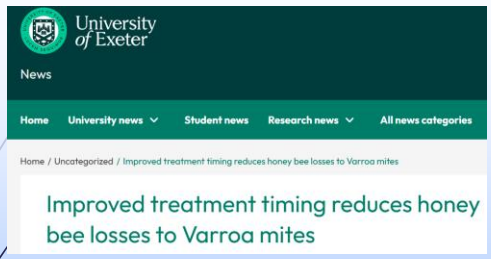


Summary of methods for treating Varroa

Method	Advantages	Disadvantages
Authorised Varroacides	• Proven efficacy when used as directed. • Proven safety when used as directed. • Convenient to use	• Mite may develop resistance if incorrectly used. • Residue issues if misused
Integrated Pest Management	• Can reduce the need for Varroacides • Reduces development of resistance in mites	• Requires monitoring to adapt to changing infestation levels • Can require a higher level of knowledge and beekeeping techniques.
Biotechnical methods	• Can be combined with summer management • Inexpensive or free	• Time consuming • Higher level of beekeeping skill required • Not sufficient by itself • Misuse can harm colonies
Treatment Free Beekeeping	• Inexpensive or free	• Not recommended for beginners • Can be harmful to bees, beekeepers and other pollinators if mismanaged

This is from the Scottish Varroa Package booklet. It gives different methods of treating and the benefits and difficulties. It is for you to decide which is best for your situation. Using different methods in conjunction with each other can improve your pest management.

Timing is key

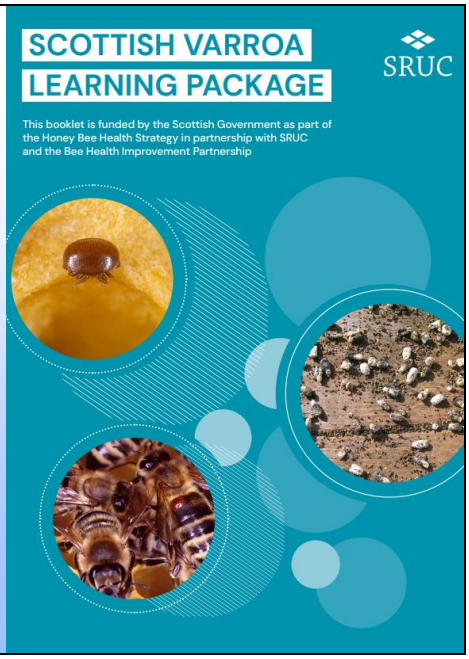


- Our winter bees need to be strong and treated on time

It is important to treat in time to make sure the winter bees are health and have the lifespan to survive through the winter. The study quoted above emphasises this. This can be an issue for beekeepers who take their bees to the heather, as this can delay the vital autumn treatment https://news.exeter.ac.uk/uk/cornwall/improved-treatment-timing-reduces-honey-bee-losses-to-varroa-mites/

Varroa Learning Package

- Scottish-Varroa-Learning-Package.pdf (nationalbeeunit.com)



Please do read this booklet which has been designed with Scottish beekeeping in mind and share to other beekeepers

Key messages

- Varroa can have a devastating impact on a colony!
- Regular monitoring is an important part of good varroa management
- Plan an effective year-round management program to maintain low mite levels
- Keep up to date with latest treatments
- Poor varroa control can also have a negative impact on other colonies in the vicinity of your apiary

There is really no option to do nothing. Our bees need our help when dealing with Varroa

Here are some of the Government and SRUC resources available to you. If you have any queries you can contact the Honey Bee Health Team by email.
Information about how the Scottish Government supports honey bees in Scotland can be found via the QR codes.
SRUC podcasts on honey bee management can be found using the QR code.

Resources Available – Others

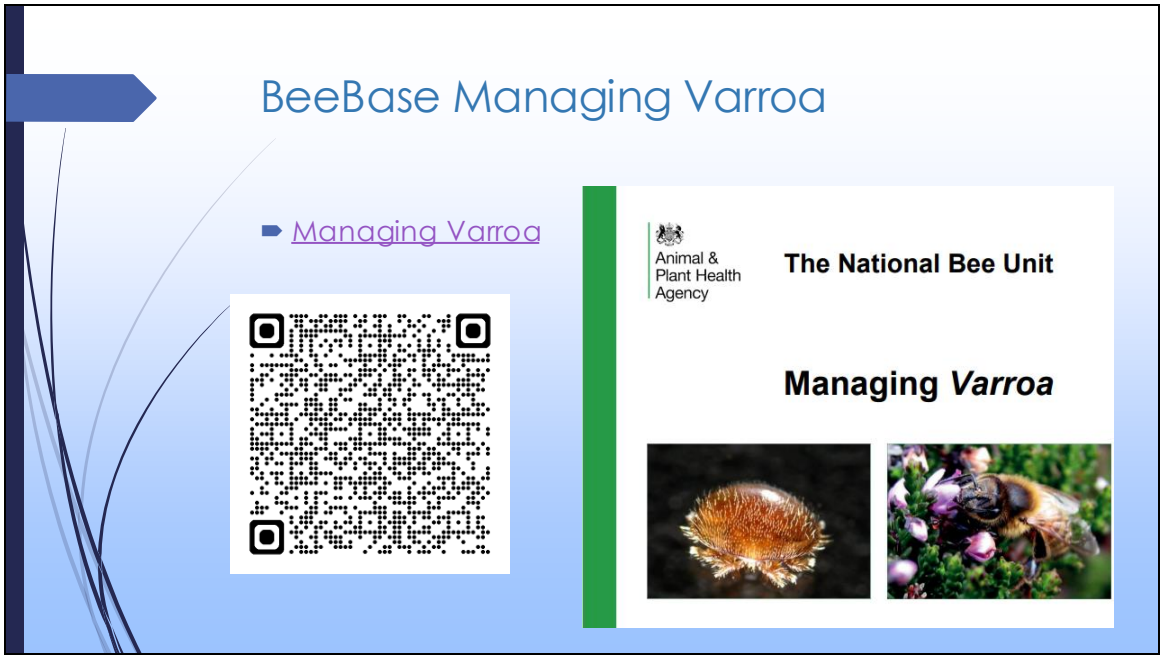
Scottish Beekeepers Association

Bee Farmers Association

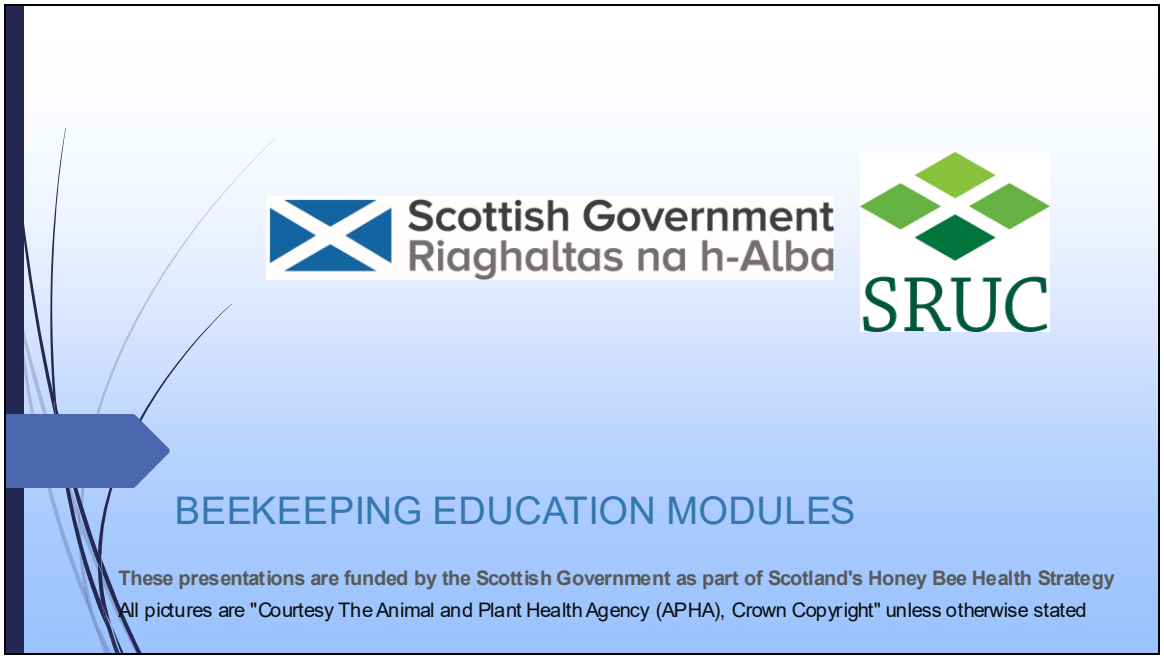
BeeBase – Information for Scottish Beekeepers

Product Information Database - Currently authorised products

You can also use a search engine to find these links



BeeBase have updated their Managing Varroa booklet. Remember it is designed for England and Wales do some information may not apply to us in Scotland.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Thank you