Varroa – slowing the spread

The first stage of *Varroa destructor* (varroa) management is slowing its spread. This will keep the varroa population low, allowing for easier management and prevent it expanding into new areas for as long as possible. There are several techniques beekeepers can incorporate into their operation to help slow the spread of varroa.

How does varroa spread?

To slow the spread of varroa, we need to understand the mechanisms by which varroa moves between colonies and across landscapes. At a local level, varroa spreads primarily by horizontal transmission i.e. infestation spreads between nearby colonies. However, due to human intervention and the ability of honey bee swarms to stow away on vehicles, varroa can rapidly spread over great distances to invade new areas.

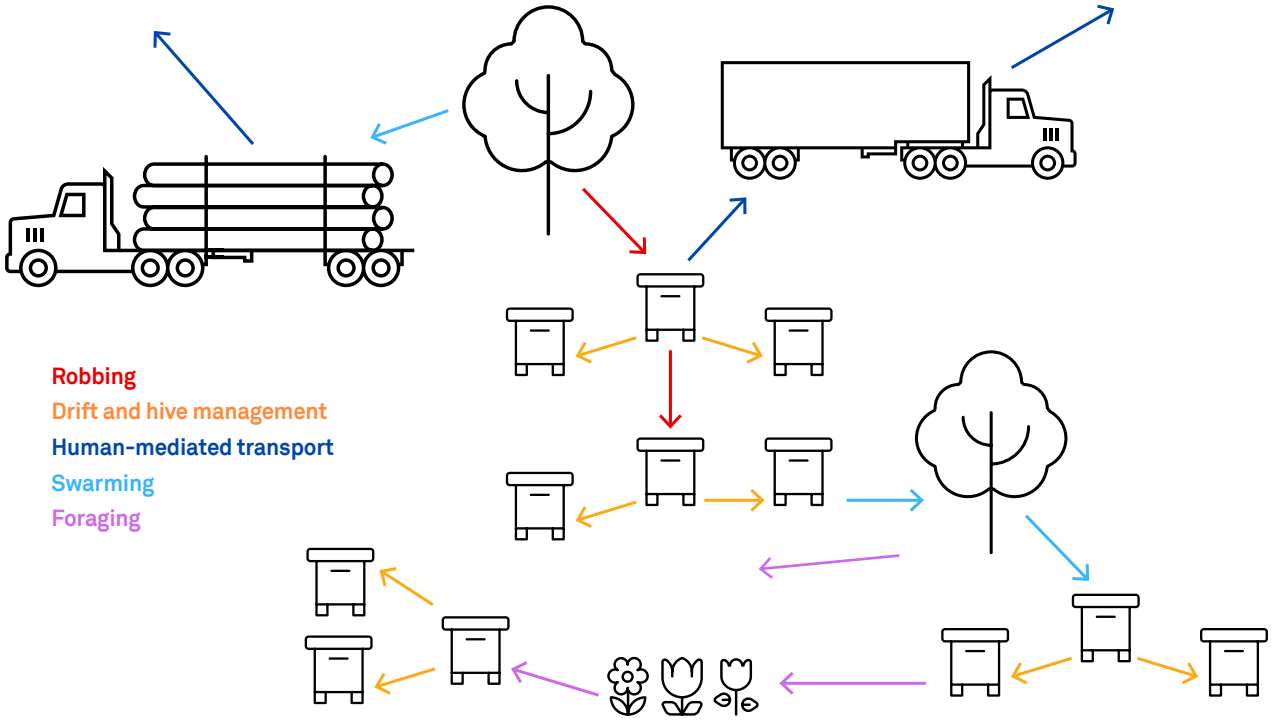

Figure 1. How varroa spreads within and between apiaries. Varroa spreads via robbing (red arrows) both from the feral population to the managed population and within the domestic population. Varroa spreads to other hives in the apiary via bee drift or beekeeper management such as the movement of brood frames (orange arrows). It can spread when a colony absconds or swarms (light blue arrows), by hitchhiking on a foraging bee and finding another forager to hitch a ride on that belongs to another apiary (purple arrows). It can also be spread further afield on vehicles used by beekeepers and other industries (dark blue arrows). Apiaries are depicted by a collection of three colonies.

Spread within apiaries

Robbing. Colonies weakened by varroa eventually find themselves in a state of collapse and become targets for robber bees, which then bring the mites back to their colony. Managed colonies are often infected by collapsing feral colonies nearby - known as 'mite bombs'.

Drift. Workers or drones carrying varroa return to the wrong hive, spreading varroa to it.

Beekeeper activity can spread varroa within an apiary by swapping brood and food frames between infested and uninfested colonies, or on equipment. However, once varroa is established in an apiary it is likely to be in all hives.

Further afield

Swarming. When a colony infested with varroa splits to form a reproductive swarm, up to 25% of the mites in the colony are carried with the swarm to its new location, becoming an infestation risk to colonies nearby. Reproductive swarms can nest up to 2km from the parent colony.

Floral transmission. A foraging worker may leave a varroa mite on a flower, which can then climb on to the next worker to visit the flower and return with her to a new colony. Foraging workers can travel up to 10 km from their home colony.

Absconding. If colonies have a high mite load, they may abscond (abandon the hive) in an attempt to escape the irritation. However, any mites attached to the adult bees will be brought with them. When absconding, colonies may travel up to 15 km.

Human-mediated spread. Activities such as honey gathering, exchanging equipment and long-range movement of hives allows varroa to rapidly disperse over great distances.

Varroa can also be spread by people who aren't involved with beekeeping. Honey bee swarms commonly rest on road vehicles, ships and even aircraft. This means that they can be rapidly transported over long distances by unwitting people. Any vehicle travelling over long distances is a potential expansion route for varroa, though logging trucks will be of higher risk due to the chance of a colony being in the logs..

Practice changes to limit the spread of varroa

Once varroa has established in an area, it is impossible to stop its spread entirely. Fortunately, with a few modifications to regular practice, beekeepers can significantly slow the spread of varroa. This is extremely important, as slowing spread will help keep the varroa population low, making it much easier to manage. It will also buy more time for beekeepers to prepare in areas varroa has not yet reached.

Reducing drift of bees

The simplest way to reduce drift is to place colonies as far apart as possible. While this may be possible for recreational beekeepers, it is not practical for beekeepers managing large numbers of bees or at mass pollination events. However, beekeepers can paint their hive boxes with unique combinations of patterns and colours. This will reduce orientation errors for returning foragers and drones, making it more likely that they will return to the correct hive.

Minimise robbing

As robbing is the primary means by which varroa spreads locally, beekeepers should ensure their colonies are strong and well-fed and that the hive box is in good condition. These are also requirements of *The Australian Honey Bee Industry Biosecurity Code of Practice*. Beekeepers should remove any colonies that are in a state of collapse. Removing targets for robber bees greatly reduces the spread of disease within an apiary, including varroa.

Swarm management

If varroa is detected within a colony, beekeepers should ensure that this colony is not allowed to swarm (as well as applying appropriate treatments). Even if varroa becomes established, swarm management should still be undertaken to keep the varroa population within an area low.

Monitoring

Monitoring for the degree of infestation of colonies and apiaries is vital to varroa management. Alcohol/soapy washes are the recommended monitoring method, as they can be used to produce reliable and consistent population estimates. Knowing the infestation rate will inform beekeepers as to whether hives from this apiary can be moved; if mite numbers are too high the colony should be removed from the population to prevent a mite bomb.

Inspection of vehicles and cargo

Honey bees and any mites they are carrying can be spread on any vehicle, not just those involved in beekeeping. Everyone, not just beekeepers, will be responsible for ensuring that vehicles about to embark on long journeys are not carrying unwanted bees and mites. This can prevent varroa from rapidly expanding into previously uninfested areas.

Register your hives

It is a requirement of the *The Australian Honey Bee Industry Biosecurity Code of Practice* that all beekeepers are registered in Australia. Registration is more important than ever as we try to stop the spread.

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Varroa support

This fact sheet is the first of a series to support beekeepers to manage varroa. Other tools will also be made available, including webinars and podcasts. You can find all these tools online at AHBIC and AgriFutures Honey Bee & Pollination Program. AgriFutures Australia is working to support beekeepers in conjunction with industry.

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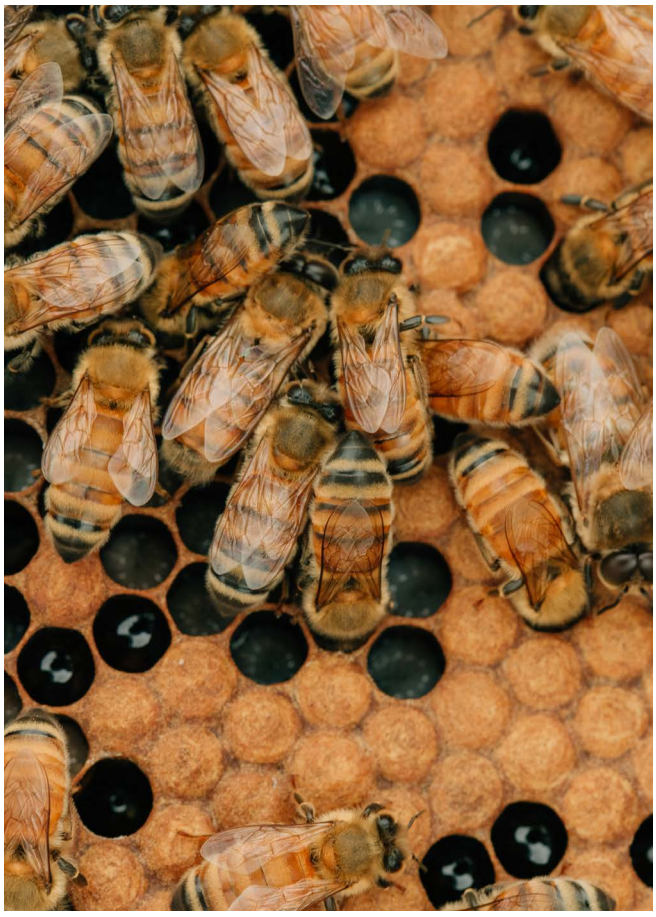

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