



The Food & Environment
Research Agency

National Bee Unit

Best Practice Guideline No. 6

Spring checks

Managed honey bees, like all livestock, have various needs, so understanding honeybee biology and recognizing these requirements enables beekeepers to know what to do and when to do it. The only way that you can know what is happening to your colonies is by regular checks and when appropriate full inspections. As the season starts and the bees become active again it is important for beekeepers to carry out their first spring checks with the aim of seeing how the colonies have overwintered and to prepare them for the coming season. This note provides guidance for beekeepers carrying out spring checks.

Spring checks

Beekeepers talk about spring checks as if they are the first visits of the year but in reality visits should have already taken place. Bees should not just be “put to bed” in autumn and left to their own devices until the following spring; to do so is to dramatically increase the chances of colony losses. Over the winter months apiary visits are made to make sure that hive roofs have not been blown off; that hives are still upright, as they can be knocked over as a result of winter storms, stray animal interference or vandalism; to monitor *Varroa* levels and carry out treatments typically in January using oxalic acid. Hefting hives, a skill all beekeepers should develop, will also indicate if your colonies need emergency feeding. Lifting the crown board also enables assessment of stores which can be done in conjunction with a winter *Varroa* treatment, or on a frosty day when the winter cluster will remain intact. The boxes may also need protecting from woodpecker attacks as they search out bee grubs for winter food.

The first part of the year is a critical time for honeybee colonies as the overwintering population rears brood to replace itself and develop the colony for spring and summer. Adult bee diseases such as *Nosema* and Acarine can impact seriously on colony development at this time as they shorten the life span of adult bees, causing

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the over winter bees to die before replacement brood hatches. This causes colonies to dwindle but often they recover through the summer. However, they are of little use as productive units. Dwindling also occurs when *Varroa* has been inadequately controlled (often too late in the previous autumn) and as a result, the winter bees are damaged and infected with virus diseases. The lives of these bees are significantly shortened and colonies rarely recover, dying in late winter. Spring checks should be completed by late February or early March. You must not wait until April. This is the period of the year when many colonies are lost and feeding a starving colony in February or March can be a miracle cure enabling it to survive and become productive.

Spring inspections

On fine days colonies can be fully inspected. As a general rule colonies should not be examined below 10, quickly between 10 and 14 and above 14 there will be no problem. Bees do not usually fly below about 10 so this is a very useful guide. Many early spring days in March are warm enough for full inspections but conditions and geographic variation will dictate a suitable time. Many beekeepers worry about chilling brood during early inspections but chilled brood is only found where brood has been left exposed for some time usually as the result of a sudden drop in adult bee numbers such as occurs following a spray incident. Additionally, damage is done by letting hot sun shine onto eggs and young larvae that rapidly become desiccated. Also many beekeepers particularly when new to the craft do not realize the importance of these early checks and loose swarms without realizing it and find the brood at the periphery of the brood nest chilled due to the drop in adult bee numbers.

The NBU apiary team carry out a detailed inspection of all their colonies on the first warm days in late February or early March but will postpone if the weather is bad.

'Golden Questions'

During spring inspections you need to ask the following:

Food - Have the bees got enough honey and pollen until the next visit?

Room - Have the bees got enough room to expand the brood nest? Do the colonies need supers put on? Will they need supers at the next visit?

Queen - Is the colony Queen-right and headed by a young prolific Queen?

Queen cells - Are there any? Is the colony trying to swarm? Has it swarmed?

Health - Are there signs of pests and diseases?

Comb Condition - Do I need to change some or all of the frames and combs?

Spring Clean – Do I need to clean up the hive?

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Apiary - If in an overwintering apiary site do I need to move all or some of the colonies to a crop such as oil seed rape or other productive location?

Food

Bees can starve at any time of the year and if this happens it is the beekeeper and not the bees who should take the blame. It is the responsibility of the beekeeper to make sure the bees have enough stores. If bees are starving at this inspection, there are several options of rescuing the colony.

You can feed the colony with frames of honey. As you look through the combs you should first reach combs of honey or syrup stores. Check that the colony has 4-5 combs with honey/stores (equivalent of 2 full BS frames). Remember March and April are the months when the bees will be using up food reserves fast as the colony expands and produces more brood. It is far better to have fed sufficient stores or left lots of honey in the autumn than to do emergency feeding in the spring.

You can feed sugar syrup using a suitable feeder or in extreme cases spray the bees with a thin sugar solution and then fill an empty comb with sugar syrup, pour it into the cells slowly using a honey jar and lid with 3 mm holes on opposite sides, or use a squeeze bottle, e.g. a cleansed washing up fluid bottle. Then place the comb adjacent to the bees.

A full sized colony should have a minimum of 2-3 deep BS frames of honey/stores available at all times.

You can feed the colony candy/fondant.

Many beekeepers feed a thin syrup solution to encourage brood rearing but this is arguably pointless if the colony has sufficient stores as stated above. To rear brood bees need to feed a mix of honey or sugar and pollen. To encourage brood rearing ensure that the colonies are close to early pollen crops or feed pollen.

Don't forget that adequate pollen stores are very important. Do not assume that there is enough pollen in the colonies as spring shortages are common. Assessing the plants around winter apiary sites is important to ensure plenty of spring pollens. If you find it is insufficient feed a pollen substitute, pollen patty or pollen collected and stored in the freezer from the previous season. Re-assessment of such apiary sites should take place.

Room

Colonies of bees need room for both themselves, stores and to expand the brood nest.

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Congested brood nests will dictate a need to swarm. Getting the right balance of winter stores fed in the previous autumn is a major factor. Don't just feed bees - calculate their requirements and feed to create the right level of stores in spring.

As the colony expands it will also need space in which the bees can temporarily store nectar before moving it to supers. So as the bee colony expands put on a super. At this time super combs put on colonies should be drawn out. Bees can be reluctant to pass through a queen excluder to the first super, so providing there is a honey arch over all the bee brood, the excluder may be left out for a couple of days. When putting the excluder in make sure the queen is actually in the brood box and has not laid eggs in the super comb. This because the honey arch will act as a natural barrier to stop the queen entering the super. Unless there is a nectar flow foundation will become spoilt.

Giving this extra room for the bees usually starts at the end of April or the beginning of May and needs to be considered at every visit until late summer. Keep well ahead of the bees by adding another super when 2/3rds of the previous box is occupied by bees. This is often indicated by brace comb being built between the top of the frames and the crown board. Do not put too many supers on a colony as it encourages "chimneying" resulting in nectar only being stored in the centre frames and leaving more honey uncapped. Getting the balance right comes with experience but remember congestion is a major factor in swarming.

Queen

Check that a queen is present. There is no need to actually see her, just make sure that eggs and brood are present. If you see her and there are no eggs or brood it could indicate a shortage of suitable stores including pollen, or that she is a young queen who has not started to lay.

If you wish to mark and/or clip queens this is a good time to find her and do so.

If you know the overwintered queen was marked seeing an unmarked queen indicates supersedure.

Keeping young prolific queens means fewer swarms and more honey. If a queen is older than 2 years, beekeepers should plan to replace her. If she is particularly good use her in a queen rearing programme.

Using queens reared from docile colonies will make colony inspections easier than having to handle defensive colonies. Docile stocks make beekeeping far more enjoyable.

Selecting stocks and queen rearing will be covered in other best practice guidelines.

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Marking a queen can make her easy to identify and helps beekeepers keep a track of her age. The following colours are used to mark queens born in years ending in:

White: 1, 6

Yellow: 2, 7

Red: 3, 8

Green: 4, 9

Blue: 5, 0

Queen Cells

Many beekeepers believe that bees are unlikely to be raising queen cells in March or April. However swarms at this time are not that unusual especially in warmer cities such as London. If queen cells are present then there could be something seriously wrong with the colony so you need to examine the evidence and decide what is happening. E.g., are the bees going to swarm because of congestion? Have they swarmed? Has the queen been accidentally killed or lost so the bees are raising emergency queen cells? Knowledge of the appearance of queen cells is an important factor in answering these and other such questions.

If you need to perform an artificial swarm at this time you will need a supply of clean drawn brood comb or if you have to use foundation you will need to extensively feed sugar syrup if there is no significant nectar flow. Further information about artificial swarming will be published in another best practice guideline.

The NBU has a policy of over-wintering a number of five frame nucleus colonies that can be used as replacements for any failing colonies in the spring. If a colony is found in trouble then it can be replaced by the nucleus. The nucleus is transferred into the full size brood chambers and the remainder of the failing/failed colony (provided the bees and any remaining brood are **healthy**) are united. The bees are usually shaken onto the ground in front and make their way slowly into the newly formed colony.

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Queen cells that are reared in the middle of the frame in this way are usually emergency queen cells and should not be destroyed. They are usually a sign that the current queen has been lost or killed.

Health

Healthy thriving bees collect more honey and increase the pollinating force. Spring is a good time to check for disease. It is important to set aside at least two specific apiary inspection for this at the beginning and towards the end of the season.

If you are a beginner learn to recognize the appearance of healthy brood. If your brood doesn't look healthy ask for help from your mentor, an experienced beekeeper or your local Bee Inspector. Early recognition is the key to controlling diseases.

The colony should cover between 5 and 10 frames. Look for evidence of the brood nest expanding e.g. lots of new eggs or larvae. If there are less than 5 frames of bees it indicates that something is wrong such as the adult bee diseases of *Nosema* and Acarine which cause spring dwindling, or viral diseases caused by poor *Varroa* control.

As you check through the combs towards the edge of the nest you should see honey stores and pollen (Food) and then towards the middle of the nest, patches of brood with a pollen and honey arch above (see picture below).

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To examine the brood you need to shake the bees off the frames to have a clear view of it. To do this take out the dummy board or the first frame and lean it against the hive close to the entrance. This will give space to shake the bees off the next comb. Being careful not to roll bees between the adjacent frames or hive end wall lift the frame so it is about half to three quarters out of the brood box, move the frame quickly downwards and stop suddenly before the frame is back to its normal position. Most of the bees will fall to the floor. If the queen is shaken off the frame onto the floor no harm should come to her. If necessary carry out the procedure another time. If the frame has queen cells on which you intend or may need to keep do not shake the comb as you may dislodge the developing queen larvae or pupae. Gently touching the bees with the inside face of your fingers or gently blowing on them will cause the bees to move away so that you can examine that patch of brood.

Open brood cells should have either a single egg at the base or one developing larvae which should be 'C' shaped, lying in the base of the cell, being pearly white and having finely defined body segments.

Sealed brood cells should have completely closed cappings in blocks looking very much like a digestive biscuit. If the cappings are greasy, sunken or perforated it indicates that disease may be present. Gently lifting and scraping these damaged cappings to one side with a match stick lets you look inside to see what is present. The match stick should be burnt in the smoker afterwards. You also need to be able to differentiate between cappings which are being sealed over and those that are

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perforated. Usually cappings that are being built have a hole in the centre and will be adjacent to open brood. Cappings which are perforated usually have jagged holes to one side.

As brood diseases take hold, bees often remove the cappings and clean out cells which are then re-laid by the queen outside of the normal brood timing. Together with cells being taken out of use this gives rise to an uneven patchy appearance to the brood which is known as 'pepper pot brood'.

Further pictures of healthy and diseased brood can be found in the NBU leaflet 'Foulbrood Disease of Honey Bees & other common brood disorders'. Pictures of brood damaged by *Varroa* and its related diseases can be found in the leaflet 'Managing *Varroa*'.

Spring is a good time to check colonies for the presence of the exotic pests *Tropilaelaps* mites or Small hive beetle. Further details can be found in the NBU leaflets '*Tropilaelaps*, Parasitic mites of honey bees' and 'Small hive beetle (SHB), a serious threat to European apiculture'

If you think that your bees are infected with either American or European foulbrood disease, or are infested with *Tropilaelaps* mites or Small hive beetle you must inform your local Bee Inspector or the National Bee Unit.

Comb Condition

Keeping bees in clean hives and on good comb reduces pathogen level build up in the hive and the risk of disease, making management of colonies easier.

With early spring checks old or damaged frames and comb put to the side of the brood chamber in the autumn can be replaced with new clean drawn comb providing you have a supply. If you are using smaller hives such as Nationals then you should consider using some brood boxes as supers to obtain this essential product. If you put in frames of foundation without a nectar flow the bees will walk over it, propolise it and make it dirty and unattractive. The bees will then chew holes in it and poor combs will result. Feeding to encourage the bees to draw foundation will result in the syrup being stored in the brood frames and congesting the brood nest! With larger type hives it is usually possible to wait until there is a nectar flow before replacing the end frames with foundation. See FAQ No.5 'Replacing Comb'.

It is very important to regularly replace brood comb and there are methods such as the Bailey Comb change or shook swarm to replace all the brood combs in a colony at the same time. If you have a disease problem or keep bees in a known foulbrood area changing all the brood combs every other year can effectively control disease. See FAQs No. 5 'Replacing Comb' & No. 16 'Shook Swarm'.

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Spring Clean

When you are doing spring checks it is a good time to do some spring cleaning such as scraping the top bars and crown board free of brace comb and other detritus. Better still clean the top bars and put the frames and bees into a clean hive on a clean floor board. If you do not have much spare equipment you can scrape out and lightly scorch the old hive and then use it for the next colony change. You may need to scrape the floors and collect the debris into bags for *Tropilaelaps* or SHB checks by the NBU. At the time of writing these will only be for sentinel apiaries agreed by the NBU.



Lightly scorching used brood boxes, crown boards and floors will sterilise them so that they can then be used for the next colony.

If you send the debris to the NBU send them in a sealed bag, protected in a firm cardboard box and taped around the edges so that the debris does not drop out in transit. Your Regional Bee Inspector can help and advise with this.

Further Information

There are a number of separate advisory notes and FAQs on BeeBase that can be read in conjunction with this guidance. More guidance notes are in preparation. Any feedback on these documents are welcomed by contacting the NBU whose details are at the foot of each page

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