

# Standard Operating Procedure (SOP)

## Colony Inspections.

### Purpose:

*This SOP provides detailed instructions on how to carry out a routine colony inspection between the months of late April/May until the end of September, subject to weather conditions.*

### Check-list

Potential Hazards:	Prevention/Action Needed
Getting severely stung	<p>When opening a hive, wear a bee suit, or at minimum, a veil, and gloves, regardless of the task.</p> <p>Ensure your ankles are covered by boots or wellingtons.</p> <p>It is essential to be gentle with the bees during all manipulations.</p> <p>Avoid rough handling of equipment when removing it to inspect the colony as vibrations upset the bees and cause defensive behaviour.</p> <p>Always carry anti-histamine cream in your tool kit.</p> <p>Carry an epi-pen if you are allergic to bee stings.</p>
Falling or tripping on vegetation	<p>Ensure the ground around your colonies is level and clear of vegetation such as briars and nettles.</p> <p>Carry a mobile phone and if you are working alone tell someone where you are working.</p>
<b>Special Handling &amp; Storage of Supers</b>	<p>Bear in mind that once supers are in place, you are handling a premium food, so cleanliness and hygiene are essential to prevent contamination and spoilage.</p> <p>Clean your bee suit after every day inspecting bees and have a spare suit if you have several apiaries.</p> <p>Wash all equipment in your tool kit regularly.</p> <p>When transporting full supers, ensure they are placed on a clean surface and immediately stored in a clean, bee-proof room without delay.</p>
<b>First Aid Procedures</b>	<p>Anti-histamine cream.</p> <p>Anti-histamine tablets.</p> <p>Epi-pen if allergic to bee stings.</p> <p>DO NOT open the bee suit until you are well clear of the bees</p>

<b>Inspection tool kit &amp; spare equipment-summer inspections</b>	<ul style="list-style-type: none"> <li>● Water mister,</li> <li>● Smoker &amp; smoker fuel,</li> <li>● lighter,</li> <li>● hive tool,</li> <li>● frame rest,</li> <li>● notebook &amp; pen,</li> <li>● spare brood frames,</li> <li>● supers,</li> <li>● butterfly clip,</li> <li>● queen cage,</li> <li>● marking tube &amp; queen marking pen and</li> <li>● fine scissors (for clipping the queen),</li> <li>● an empty box to house the frame the queen is on during longer inspections (nuc box is ideal),</li> <li>● a small container (no more than 5L) of washing soda solution (10% by weight),</li> <li>● queen excluders,</li> <li>● replacement equipment if swapping floors or taking home equipment for cleaning, painting or repair.</li> </ul>
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## Background Information:

**During a routine inspection there are five main observations which are critical to the wellbeing of the colony.**

**1. Is the queen present and is she laying?** It is ok to just see eggs and not see the queen, particularly during late spring before swarm season and if it is too cold to have the colony open for more than 10 minutes or so. Similarly, after a colony has become queenright again after swarm control. Technically, no further inspections are needed after successful swarm control but it is preferable to inspect every 2 weeks in case of disease, queen failure, starvation or mishaps such as damage by predators, vandals, high winds, flooding etc.

**2. Does the queen have room to lay?** Early in the season brood frames can be 'honey bound', that is, full of winter stores such as ivy honey which is being consumed at too slow a pace compared to the queen's increasing rate of lay. Crystallised capped ivy stores can be removed and stored in a bee proof room until the beekeeper is making up nucs for queen replacement, as they do not absorb water and the risk of fermentation is low. They are also invaluable during the June gap, a time when all spring forage has expired and the summer nectar flow has not yet started.

From late spring onwards, frames can also become pollen bound, but pollen is essential for colony expansion and there must always be at least one frame of pollen during the brood rearing season.

### 3. How is the colony developing?

**(i) Outside of swarming season:** the queen should be in full lay by the end of April and you would expect to see at least one additional frame of brood every week once weekly inspections have begun. After August, the reverse pattern can be expected. These are good times to perform a complete inspection for disease, as this will also have a bearing on colony build up and brood pattern in the case of brood diseases.

**(ii) During swarming season:** A queenright colony can start producing queen cells in early May, subject to prevailing weather conditions. Egg laying will reduce in the days before a swarm and queen cells, charged (larva present) or uncharged may be present. This is reflected in the brood pattern, which may appear slightly more erratic for a week or so, and until the colony is once again queen right after swarm control (or loss of a swarm and/or cast swarms if inspections are interrupted).

### 4. Disease: are there signs of brood or adult diseases?

- What are the levels of *Varroa* mite like? Is there evidence of chalkbrood either in open or capped cells?
- Could slow colony build-up be due to *Nosema*?
- Combs with brood need to be cleared of bees and inspected thoroughly early and late in the season.
- Samples of bees (and brood if foul broods are suspected) should be sent to:

**Dr. Mary Coffey** at the following address:

Plant Health Laboratories,  
Backweston Laboratory Campus,  
Ballymadeer,  
Calbridge,  
Co. Kildare,  
W23X3PH.

### 5. Stores:

- The level of stores during early season inspections can vary dramatically between colonies. Stronger colonies can starve once brood rearing begins and weaker colonies can appear honey bound.
- Having righted any such issues in early Spring, the main concern from May onwards, is whether or not there is enough stored honey or nectar until the next inspection?
- When all but the outer frames contain brood in all stages (BIAS) there should be nectar or honey present at the top corner of each frame of brood or on outermost frames.
- There should be at least one frame of freshly gathered pollen, and it is usually found at the front of the colony. Look out for excess stores in May, which could impede queen laying and again look out for lack of stores in June and after the honey harvest in September.

## Other things to consider:

**Second Nature:** Get used to always having the hive tool in your hand during inspections. Place your smoker at an easy distance from the colony.

## Do you need to use smoke?

1. If the inspection involves **searching for a new queen** that needs to be marked and clipped, avoid the use of smoke as she will run from it and be **more difficult to find**.
2. During the best of foraging conditions, at the warmest part of the day, it is possible to avoid the use of smoke altogether and just use a water mister once the hive is opened.
3. If there are **no stores in the hive**, smoke will have no effect, and will frustrate the bees and cause defensive behaviour.

**Record what you have observed** and ideally keep a copy inside the roof of the colony in a zip lock bag, and in a separate notebook. If someone else needs to inspect a colony, the information they need is with that colony. Likewise, if you forget your notebook or if the hive notes get lost or wet, you will always have a back-up copy. Some beekeepers record their findings on their mobile phone, but a limitation of this method is that another beekeeper will not be able to pick up where the main beekeeper left off.

## THE SUMMER INSPECTION:

### *Before you begin:*

1. Gather all necessary equipment needed for an expanding brood nest. This usually includes:

- supers
- queen excluders
- brood frames
- your usual tool kit contents.

2. If you must travel by car to the apiary:

- light the smoker first thing upon arrival.
- close up your bee suit at a safe distance from the hives and double check all fastenings.

3. Armed with all necessary equipment and tool kit,

- scan the apiary for any unusual activity and
- note the level of activity at the entrance of all hives present.

4. Approach the colony to be inspected quietly and

- take note of the activities at the hive entrance.

- pollen coming in means a queen is almost certainly laying or a new queen will soon begin to lay.
- there may be a nectar flow on, a dearth or robbing, and defensive behaviour can be expected in the latter two cases.
- all colonies are more defensive when they are defending winter stores against robbing bees and wasps.
- imminent poor weather can also be heralded by defensive behaviour.

## ***The Inspection proper:***

### **1. Smoker & hive tool:**

- Take your hive tool and smoker and gently blow two or three puffs of cool white smoke into the hive entrance. Smoke masks alarm pheromones that precede defensive behaviour and also causes bees to gorge on honey.
- Once you are going through the brood frames, it can be hooked onto the side of a timber brood box, but this is not possible with many of the polystyrene boxes, nor can it be rested on polystyrene roofs as it will melt them.
- If the bees begin to try to sting, close up immediately and reschedule the inspection.

### **2. Approaching the hive and removing the roof:**

- Standing at the back of the hive, at a comfortable working distance, remove the roof.
- place it up-side-down to the side of the hive (if it is a flat roof), within easy reach and where you will not need to stand or pass by.

### **3. Opening the hive:**

- Using the flat end of the hive tool in a sliding motion on two or more sides, gently prise off the crown board.
- Remove the supers and stack on the hive roof, with the corners offset.
- If the bees appear to be leaving the supers and flying around too much, align the supers directly on top of each other by “cornering” them first and then sliding them so that they are aligned, then cover with the crown board.

### **4. Before proceeding to inspect the brood box:**

- take note of where the most activity is, and how plentiful or lacking the colony is of bees.
- gently blow a puff or two of smoke across the top of the frames, or spray some water over the brood box before removing the queen excluder (QX).
- Loosen all sides of the QX using the flat end of the hive tool and remove it gently. Turn it up-side-down and **check if the queen is on it**. If she is, hold the QX over the brood frames and without squashing her, gently encourage her back into the brood box.

- The frame with the queen can then be placed into a closed empty nuc box while the inspection is done.

## 5. Inspecting the brood box:

- Using the hive tool, loosen the frame at the very back of the hive.
- If a thin dummy board is present, loosen it and remove it before removing any frames. Either way, this provides room for loosening all other frames, and sliding them towards the back of the brood box, before lifting them up for inspection.
- A 'J-tool' is specially designed for loosening frames.
- Put the 'hook' under the lug on the far side of the frame to be lifted and lever the tool against the next frame.
- Do this first on the left if you are right-handed, and then on the opposite side.
- Grip the lugs firmly with thumb and fingers.
- Lift out this frame gently without jarring it against the sides of the box.
- If it is full of stores, it will be heavy.
- Later in the season, the queen may be on this frame, so always lift this frame out as if she were there.
- Some polystyrene brood boxes do not have room for a dummy board and removing frames can be very tight work, and hazardous for the queen.
- Similarly, avoid rolling bees by lifting slowly.

## 6. Manipulating & inspecting the first frame:

- Holding the frame at eye level, check for the queen, stores, pollen, brood in all stages as well as for eggs and the queen and any signs of disease or swarming preparations.
- The queen is usually found wherever there are freshly laid (upright) eggs.
- Turn the frame <sup>1</sup> and repeat the inspection.
- Place this frame and adhering bees on a frame rest, or in an empty nuc box.

## 7. Removing remaining frames and inspecting them:

- Now you have space to safely remove the rest of the frames.
- Do this by sliding the next frame to be inspected, towards the back of the hive, into the space created each time a frame is moved backwards.
- Bees can first be cleared from the 'lugs' with smoke or water mister.
- Each frame can now be lifted out and replaced without rolling bees or queen, and inspected in the manner outlined in *note 1* below.
- If there are too many bees on the frame to be able to inspect the comb, hold the frame directly above the brood box and with one sharp movement, shake bees off the frame. Always check for the queen before doing this.

- Similarly, in early spring and late summer, when the population is reduced, safeguard your queen and shake all bees off each frame containing brood and inspect for foul broods and chalkbrood.
- A similar procedure is used when checking for swarming preparations, but the frame with the selected swarm cell is never shaken. In this case bees are brushed off the frames.

## **8. 'Read the combs'**

- Observe what stage the brood is at - open young larvae, bigger advanced larvae, capped or emerging brood.
- What does the brood pattern look like and is there is an arc of pollen above the brood, and honey or nectar above that arc. ?
- No two inspections will be the same as the season progresses, but many colonies will be at a similar physiological stage, so ask yourself before each inspection, 'what is the objective of this inspection?'
- Take notes and read them before the next inspection so that you know what equipment to bring and what to expect.
- You will also notice problems much faster this way, simply by noting the number of frames with brood each time.

## **9. Replacing frames:**

- Replace frames in the space created, making sure they are facing the same way as when you removed them.
- This ensures that you follow the pattern of contours of the comb and again, no bees get squashed, and no fresh stores will be torn open (causing a robbing threat) as the bee space is maintained.

## **10. Closing up the brood box:**

- When you have completed the inspection, the gap you created will now be at the front of the brood box.
- All frames need to be moved to their original position and this can often be done in one step as frames full of brood are lighter than frames of stores.
- If not, it is ok to do it in two steps by pushing the lugs of one of the frames towards the back until all are in their original position.
- The more popular Hoffman frames are self-spacing, and bees will not be crushed.
- If you are using frames with spacers (DN1), bees need to be cleared before pressing them together at the end of the inspection. In any case, the gap is once again at the back of the hive and the last remaining frame (or thin dummy board) can now be carefully replaced.
- With all frames replaced, clear the bees, and scrape off any brace comb and/or propolis. Bring all scrapings home for rendering and do not litter the apiary as this might spread disease or cause robbing.

- Replace the crown board, or queen excluder, super(s) and crown board, as appropriate for the time of year. Replace the roof gently. If the inspection tray is inserted, inspect it for varroa, scrape clean and replace if necessary to continue monitoring or if brood rearing has begun and the weather is cold and brood rearing has started in earnest.

### **11. Avoid cross contamination:**

Rinse your hive tool and gloves in washing 10% soda solution before proceeding to the next colony or finishing up for the day.

### **12. Record Keeping**

- Keep a record of how many frames of brood you saw as well as a note under each of the following headings: “REDDS”: Room to lay, Eggs (Queen), Development, Disease & Stores.
- Arrange your notebook so that all the notes for a particular colony are found on one page alongside the date and any other comments.
- Queen breeders will also want to record notes on traits such as docility, steadiness on the comb, brood pattern, comb building, pollen hoarding, honey crop, swarming/supersedure tendencies and how native the bee is in colour.
- A score between 1 and 5 can be applied at each visit and averages taken at the end of the season.
- This facilitates a more accurate selection of breeder queens for the following season.

**Notes 1. Turning a frame for inspection:** To avoid fresh nectar or pollen falling out of frames, they need to be inspected in the vertical plane.

- (i) Hold the frame by the lugs, up above shoulder height and inspect the side facing you.
- (ii) Drop the lug held by your dominant hand and raise the opposite side until the top bar is vertical.
- (iii) Rotate the frame away from you by 180° so that the opposite side is facing you.
- (iv) Raise the lug held by your dominant hand and lower the opposite lug and inspect the side facing you.

An AFB (American foulbrood) inspection involves looking up into upturned frames held above eye-level and down into upright frames which are held just short of arm’s length. This is to be able to check for scales at the advanced infection stage, at the base of the cell on the side that would otherwise not be clearly visible to you due to the upward angle at which the comb is built.