Grade 1 –

Introduction to beekeeping

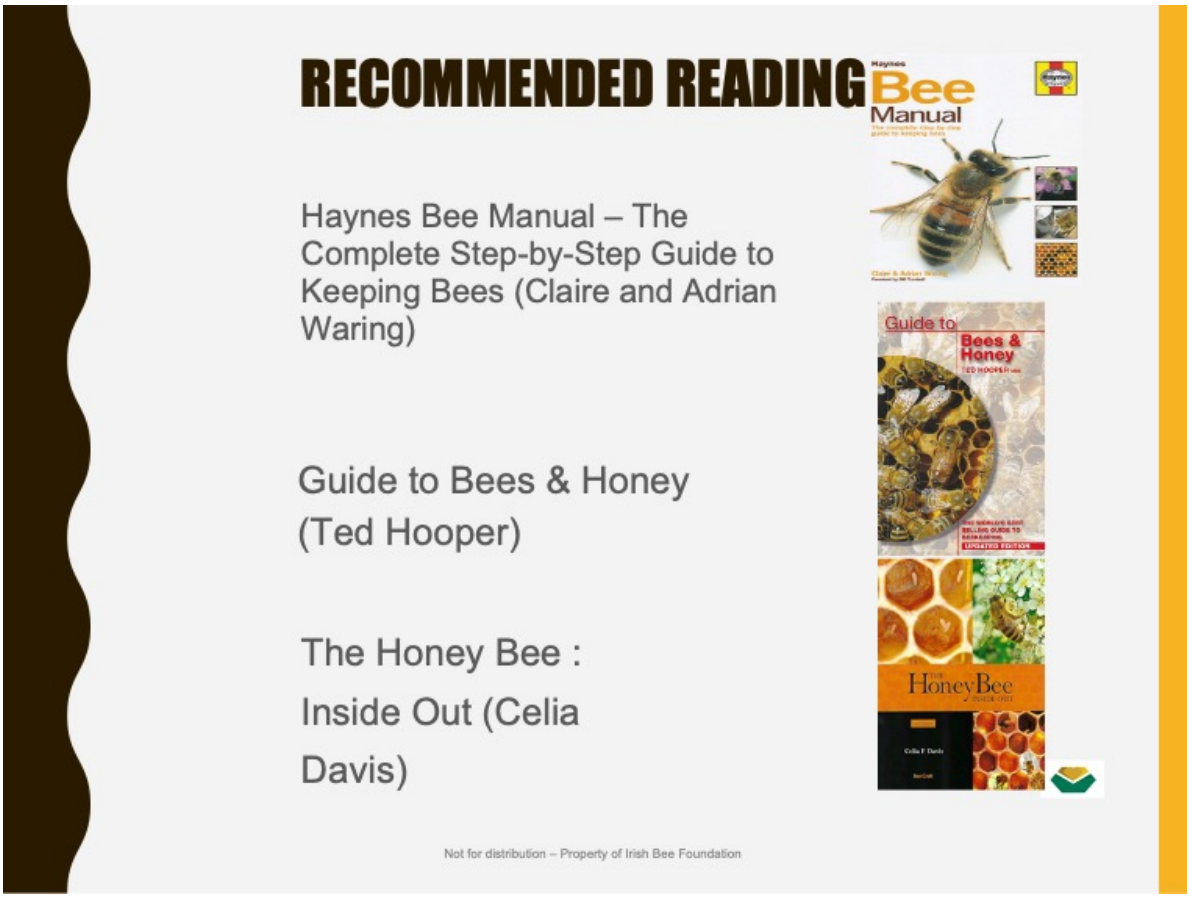
Irish Bee Foundation

PROTECTING PRESERVING PROMOTING

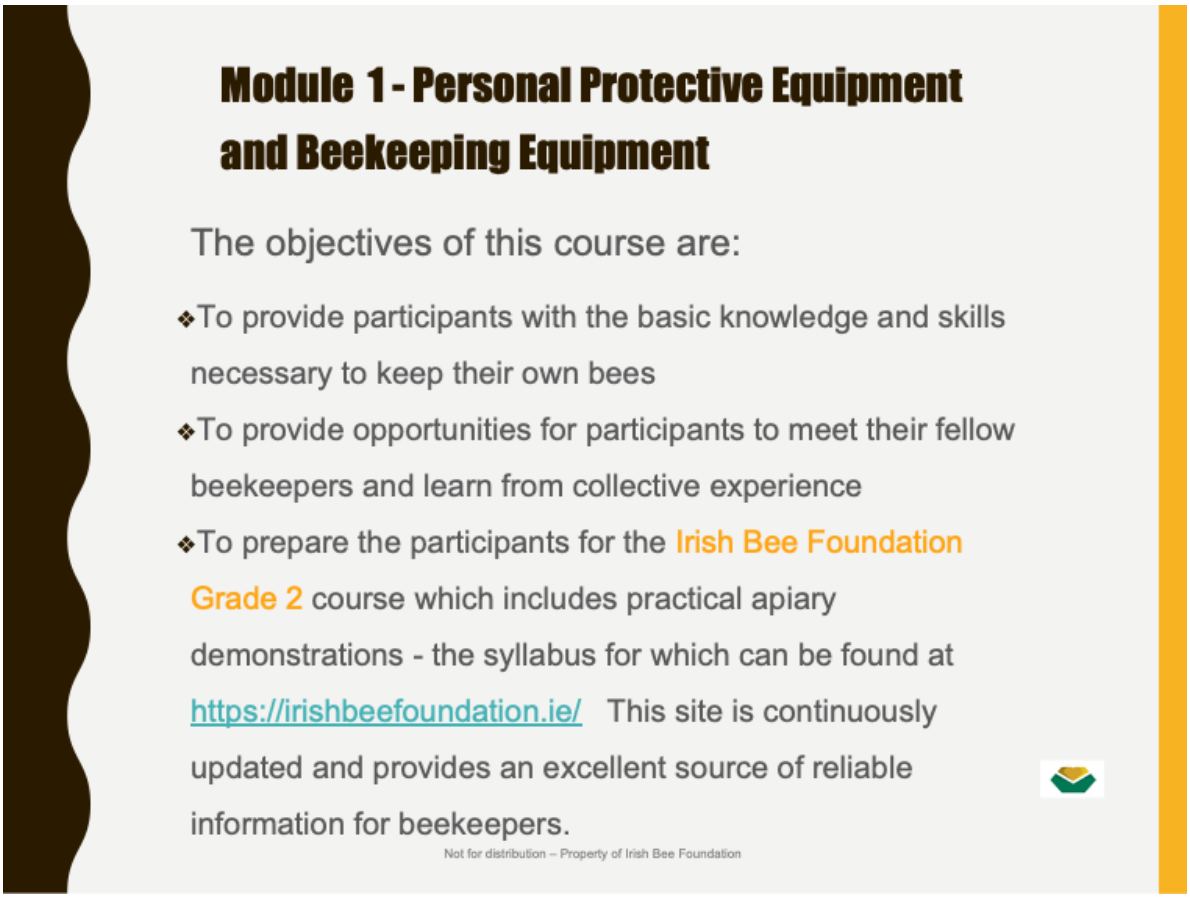
This introductory course, provided by the Irish Bee Foundation, is structured across 6 modules designed to equip participants with essential beekeeping knowledge and skills. Module 1 focuses on Personal Protective Equipment and Beekeeping Equipment. This guide will outline critical aspects of Module 1, helping you prepare for practical applications in beekeeping.

Learning Objectives

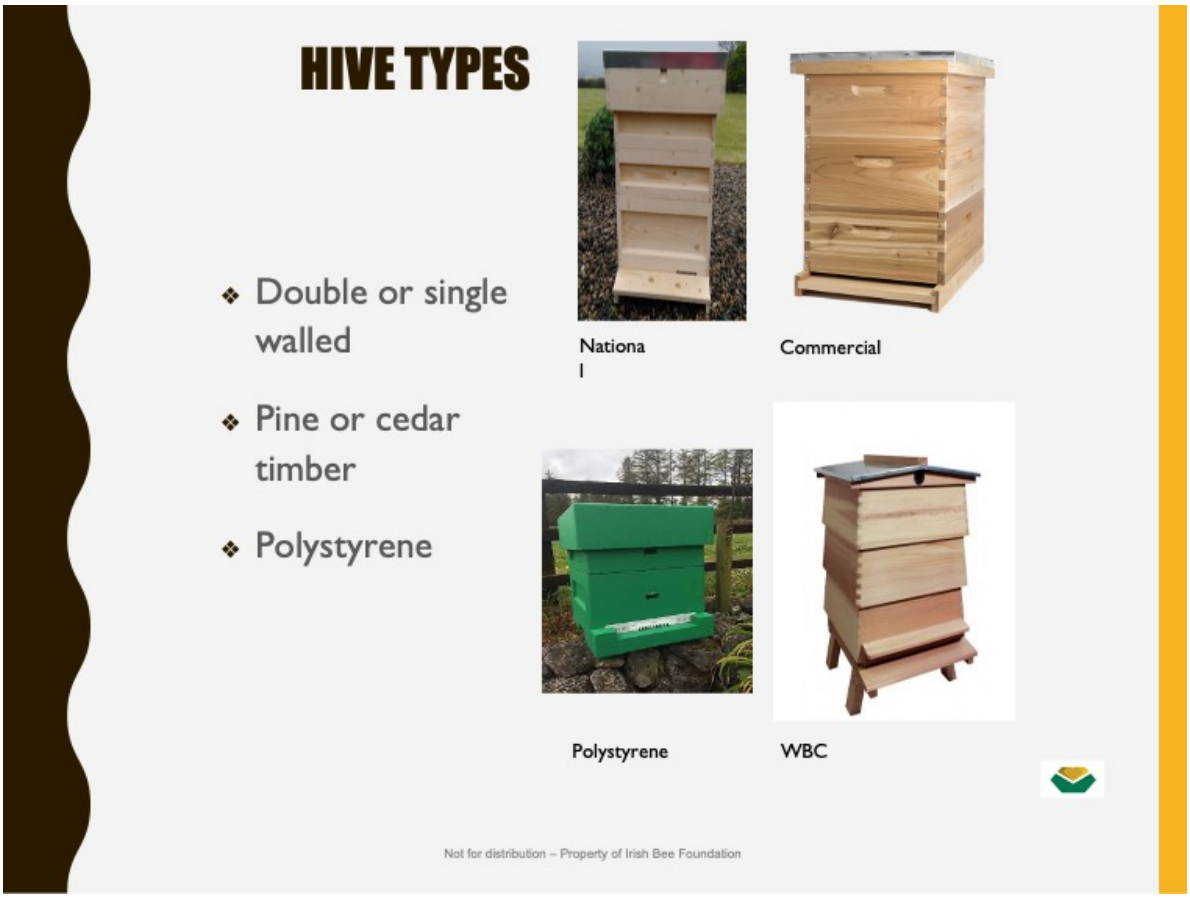
- Gain foundational knowledge of beekeeping equipment.
- Understand the role of each piece of equipment in maintaining a hive.
- Prepare for hands-on apiary demonstrations in advanced courses.



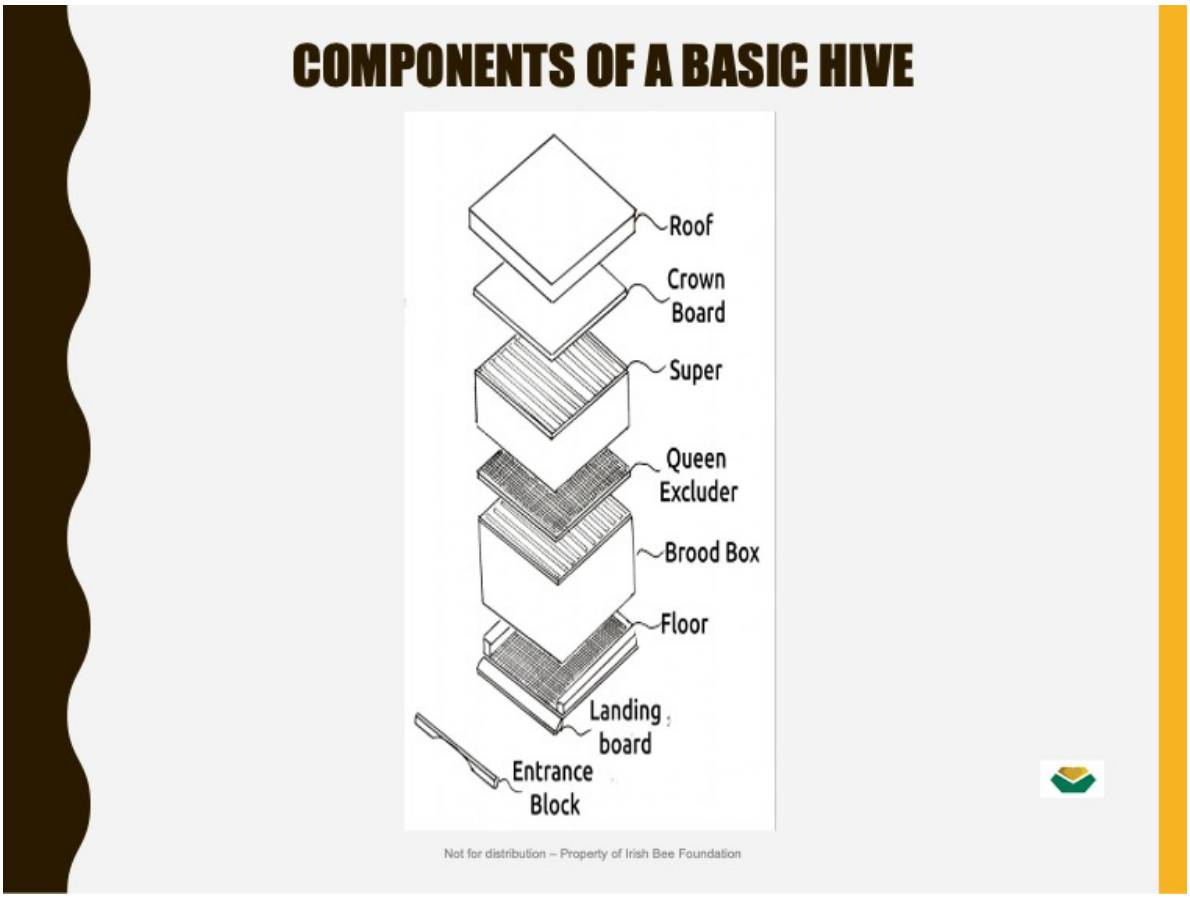
- Grade 1: Haynes Bee Manual – The Complete Step-by-Step Guide to Keeping Bees by Claire and Adrian Waring (provided).
- Additional References: Guide to Bees & Honey by Ted Hooper (Grade 2)



In beekeeping, specific tools are essential for managing hives effectively and safely. Each tool has a purpose that helps beekeepers maintain hive health, access the hive contents, and protect the colony from disturbances or pests. This section provides an in-depth look at three fundamental tools: the smoker, hive tool, and mouse guard.



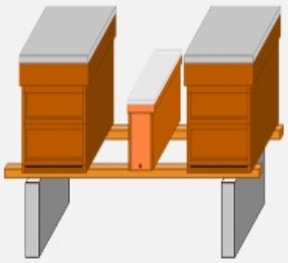
- National
- Commercial
- WBC
- Materials: Pine or cedar timber, polystyrene
- Wall Types: Single or double-walled



- Hive Stand: Provides stability and ventilation; supports at least 100kg.
- Open Mesh Floor: Aids ventilation, prevents water buildup, and supports mite monitoring.
- Entrance Block: Controls entry size for colony defense and ventilation.
- Brood Box: The primary space for egg-laying, pollen, and honey storage.
- Queen Excluder: Keeps the queen out of the honey supers, ensuring eggs aren't laid there.
- Super (with frames): Used for honey storage above the brood box.
- Frames: Essential for structured comb development and easy hive management.
- Foundation Types:
    - Wired: Stronger, less prone to collapse in extractors.
    - Unwired: Suitable for cut-comb honey production.

HIVE STAND

- Strength, should support at least 100 kg
- Level both ways (or sloped back to front)
- Ventilation
- Comfortable working height
- Landing board: pros and cons



OPEN MESH FLOOR - WITH INSERT

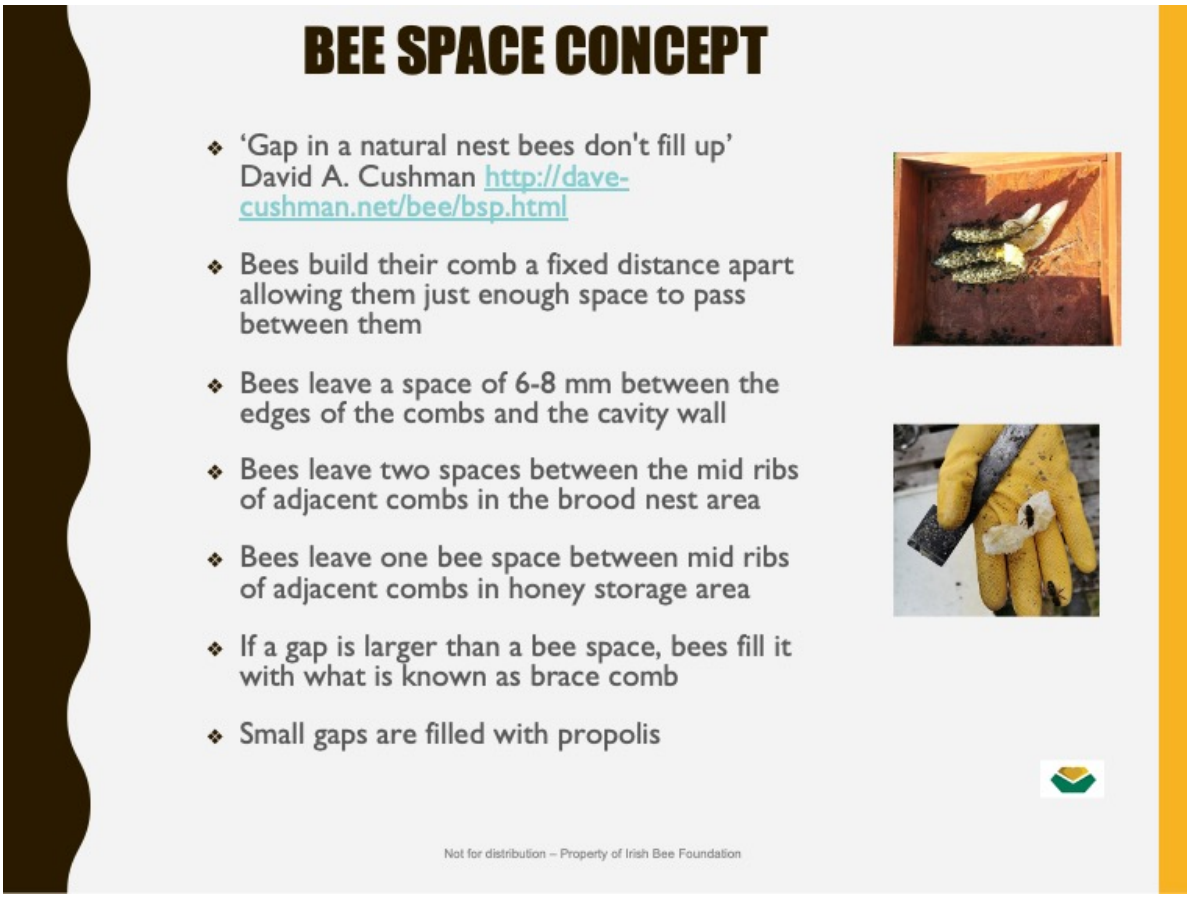
- Solid wooden floors have been replaced by open mesh floors since varroa mites arrived
- Mesh 8 squares to the inch
- Dropped mites fall through
- Facilitates varroa monitoring
- Improves ventilation
- Prevents water accumulation in level hives

ENTRANCE BLOCK

- Gives an entrance that a strong colony can defend easily (6-8 mm high and 75-100mm wide)

- Can be turned to present smaller entrance for weaker colonies or to reduce/prevent robbing (6-8mm high ad 25mm wide)

- Needs to be removed for ventilation in very hot weather



Bee Space: The gap bees naturally maintain between combs and walls, generally around 6-8 mm.

- Purpose: Allows bees to move freely without obstruction.
- Gaps larger than bee space are filled with comb or propolis.

BROOD BOX (AND FRAMES)

- Sits on stand
- Queen lays eggs here
- Pollen and honey stored here
- Frame legs sit in runners
- Top/bottom bee space

DUMMY BOARD

- Blank frame (no foundation)
- Creates space to make colony manipulation easier
- Prevents squashing bees when removing first frame

QUEEN EXCLUDER

- Ideally framed grid or a piece of slotted metal or plastic
- Gaps allow worker bees through but prevent the Queen or drones passing
- Prevents egg laying in the honey supers

SUPER - WITH FRAMES

- Bees instinctively store honey above the brood nest
- In nature, they continue comb downwards
- In a hive, supers extend the nest upwards
- Generally shallower than the brood box
- 3-4 supers required per hive
- Nectar c.a. 40% sugar, 60% water
- Honey c.a. 80% sugar, 20% water

Nectar needs more storage space than honey

FRAMES

- The discovery of **bee space** made it possible to introduce **frames that could be removed and replaced**
- Frames made to fit the brood and super boxes of the different hive types
- May use spacers to maintain bee space or self-spacing Hoffman type
- Mainly side bars are the same width all the way down preventing frames swinging

FOUNDATION

Fitting the frames with a **sheet of wax foundation** encourages the bees to build their comb within the frames

Unwired Foundation:
Used when 'cut comb' honey is desired

Wired Foundation:
Stronger in the brood box. Less likely to collapse in extractor when used in Supers

- Crown Board & Eke: Used above the brood box or supers, with cut holes for feeding or clearing.
- Feeders:
  - Types: Miller, Ashforth, Round, Frame Feeder
  - Used for sugar syrup; varies by size and feeding method.
- Roof: Ventilated and waterproof for protection against weather.

FEEDERS

A feeder is a well for sugar syrup with a means of access for the bees:

- **Contact feeders** – partial vacuum caused by air pressure. Small jar to 30lb bucket
- **Rapid feeders** – Miller and Ashforth types fit the cross section of the hive
  - **Miller**: well in centre
  - **Ashforth**: Well at one end
- **Frame feeders** have some outside dimensions as a brood frame and usually replace one in use. Gap on top bar lets bees in and float prevents them downing.

More on feeders and feeding in later notes

Miller Feeder

Frame Feeder

Ashforth Feeder

Round Feeder

ROOF

- Ventilation holes at top centre of each side
- Holes protected internally with 8sq mesh
- Covered with water-proof material
- Variable depth

- Bee Suit: Protects the entire body, with veils to cover the face.
    - Recommended brands: BJ Sherriff, BB Wear
- Gloves: Protects hands; heavier gloves offer more protection but may limit dexterity.
- Boots: Ensure ankle protection and good grip.

The smoker is one of the most crucial tools in a beekeeper's toolkit. Smoke has a calming effect on bees, making it easier for beekeepers to work around the hive without alarming the colony. When bees sense smoke, they prepare to leave the hive, which makes them less defensive.

How Smoke Calms Bees

- Alarm Suppression: Bees release pheromones to alert the colony of potential threats. Smoke interferes with this communication, reducing defensive behavior.
- Feeding Instinct: When exposed to smoke, bees instinctively gorge on honey in preparation for a possible hive evacuation. With full stomachs, they are less likely to sting.
- Minimized Disruption: By using smoke, beekeepers can inspect and manage the hive with minimal disturbance, as the bees' attention shifts from the beekeeper to the smoke.

Fuel Types for Smokers

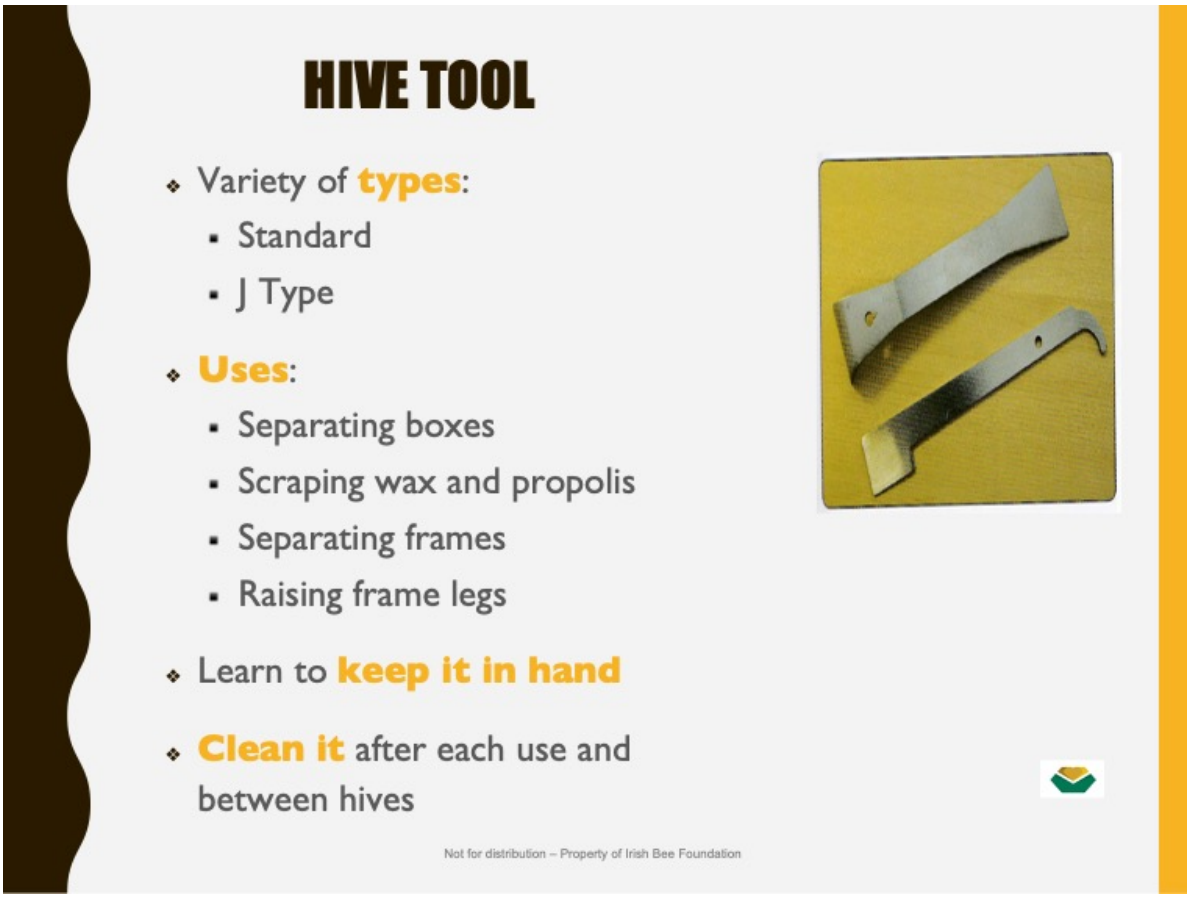
Choosing the right fuel is essential for producing cool, consistent smoke without harmful toxins. Here are some commonly used fuels and their characteristics:

- Proprietary Pellets: Specially made pellets offer a clean burn, are easy to light, and provide a steady smoke. These are widely used for their convenience.
- Wood Shavings: An affordable and easy-to-find fuel source, wood shavings produce steady smoke but should be dry to avoid excessive heat.
- Dead Leaves: Readily available, dead leaves are quick to ignite but can burn quickly. Ideal for short inspections, but not for prolonged use.
- Rotten Wood: Soft, decomposed wood burns slowly, making it useful for longer

smoke sessions. Avoid wood with mold or fungus.

- Jute Sacking: This material is easy to light, produces dense smoke, and is popular f
  be untreated to avoid chemical residues.
- Corrugated Cardboard: A convenient option but must be free of ink and adhesives. (
  temperatures, so it's suitable for short sessions.
- Dry Moss: Often used as a secondary fuel, moss helps maintain a steady smoke flo
  to avoid damp smoke.

Important Note: Always use untreated, non-toxic materials in your smoker to protect both y
should be cool, consistent, and non-toxic.



The hive tool is a versatile, multipurpose instrument that no beekeeper should be without. It assists with oparating Boxes and Frames: Hive components are often sealed with propolis (a sticky resin made by bees) and may require a gentle pry to open.

1. Scraping Wax and Propolis: Over time, bees accumulate wax and propolis on hive surfaces. The tool helps to remove this buildup, keeping the hive clean and functional.
2. Frame Removal: Hive tools allow beekeepers to gently lift frames without causing damage or crushing bees. Cleaning, and inspecting the hive by providing the leverage needed to separate hive components and scrape away buildup.

Uses of the Hive Tool

1. Moving Between Hives: It's essential to clean the hive tool between hive visits to prevent cross-contamination of diseases or pests.

Types of Hive Tools

There are several types of hive tools, each with unique designs for specific functions. Two of the most common are:

- Standard Hive Tool: This tool has a simple flat end for scraping and a curved end for prying. It's versatile and widely used for general tasks.
- J-Type Hive Tool: With a hook at one end, the J-type tool is excellent for prying frames out of the brood box. It provides extra leverage, which is particularly helpful with frames that are firmly adhered with propolis.

Pro Tip: Always keep the hive tool in hand while inspecting the hive, as it's easy to misplace. Regularly disinfect your hive tool to maintain hygiene and reduce the risk of disease spread.

A mouse guard is a protective device placed at the entrance of the hive to prevent small animals, particularly mice, from entering. Mice are particularly drawn to hives in late autumn and winter when they seek warmth and shelter. Once inside, mice can cause significant damage to comb, contaminate the hive, and disturb the bees.

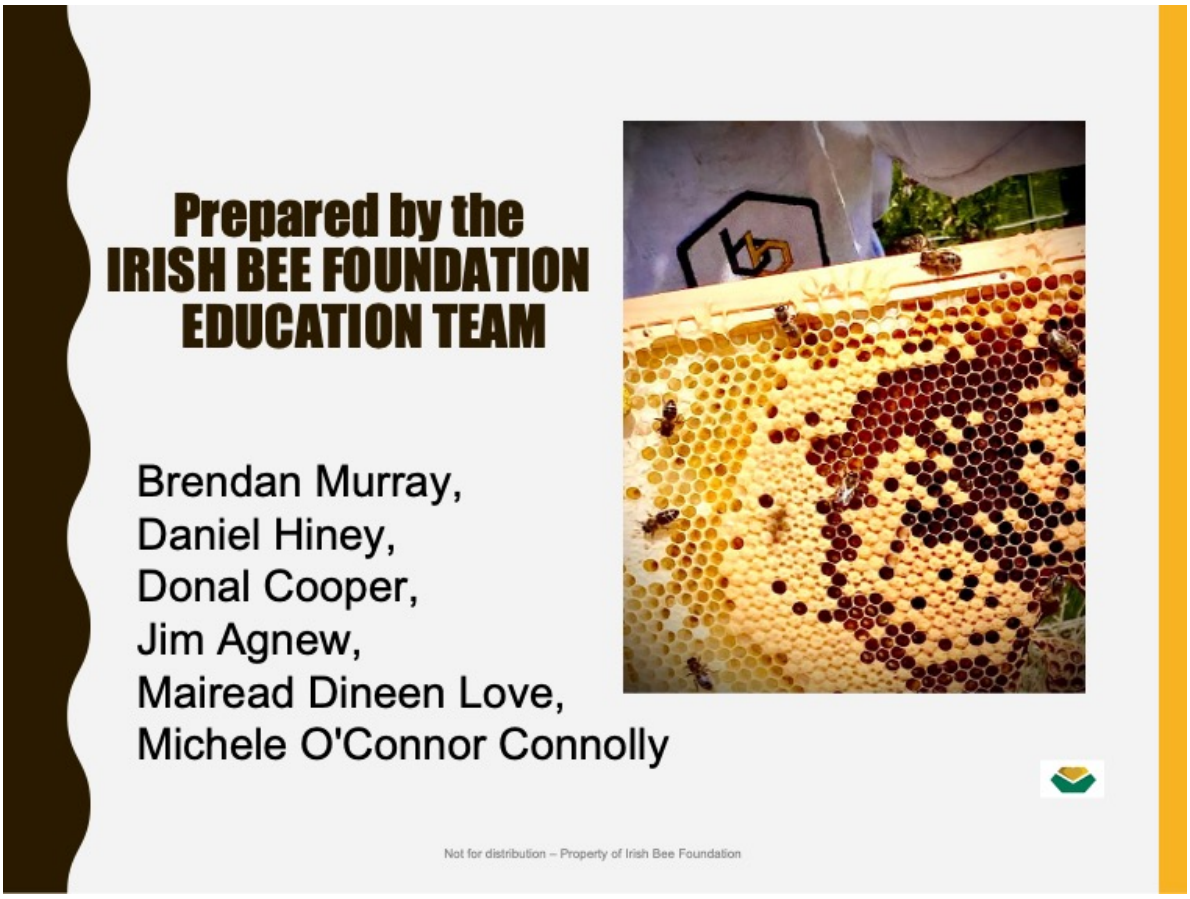
How and When to Use a Mouse Guard

- Installation Timing: It's best to install the mouse guard in late autumn (around October or November) before temperatures drop. Mice typically become active as the weather cools and start seeking warm nesting sites.
- Placement: The mouse guard replaces the entrance block, fitted tightly over the hive entrance to ensure that mice cannot chew their way in.
- Design: Mouse guards usually feature small holes or narrow slots—about 10 mm wide—that allow bees to pass through easily while keeping mice out.

Additional Tips

- Inspect Regularly: Check the mouse guard periodically to make sure it's secure and not blocked by debris.
- Remove in Spring: Once temperatures rise and mice are less of a threat, the guard can be removed to allow for easier ventilation and bee movement.
- Other Deterrents: Some beekeepers also place the hive on stands, as elevated hives are less likely to attract mice.

Summary: Proper use of the mouse guard can save the hive from unwanted intruders and potential damage, ensuring the bees remain undisturbed through the winter months.



This handout is a summary of Module 1's essential equipment knowledge. For further details, visit the Irish Bee Foundation website: https://irishbeefoundation.ie.
Go Raibh Maith Agaibh - Thank You All!