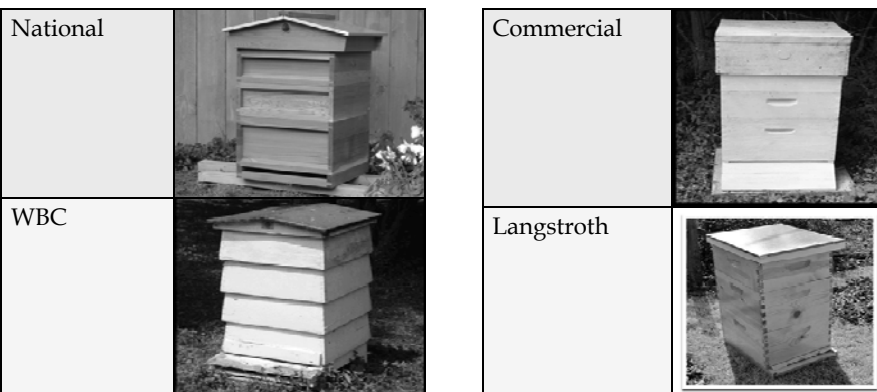









# The Beehive

Types and variations

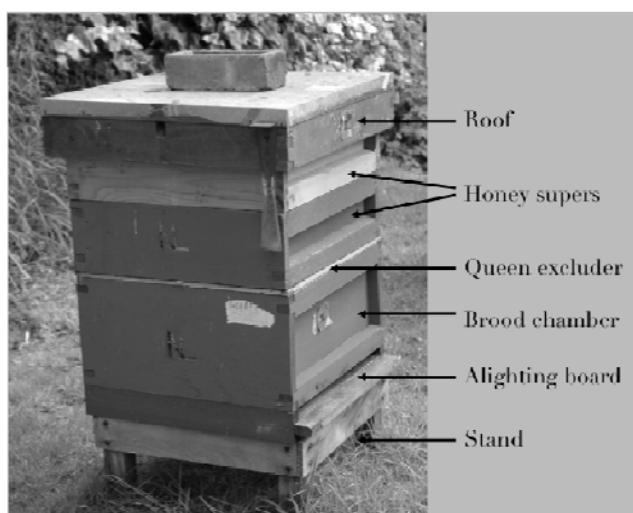
## Types of hives



## Hive components

Roof		Queen excluder	
Crown board		Brood box	
Super		Floor	
		Stand	

## Composition of a hive



## What do bees expect

- A modern bee hive is a man made home for honeybees
- Over the years many shapes and designs have been tried
- Today we favour a series of square or rectangular boxes stacked on top of each other with frames inserted on which the bees can set up home
- For a healthy lifestyle bees require an ambient temperature, stable humidity and the right amount of space
- We hope that we provide this with our bee hives!

## Bee Space

- Bees usually leave 9mm gap between two combs – enough for two bees to pass back to back
  - Smaller gaps filled with propolis
  - Larger gaps bridged with comb!
- Bottom bee space
  - There is space between the bottom of the frame and the base of the box
    - National
    - WBC
    - Commercial
- Top bee space
  - The frame runners are set low so there is a space between the top of the frames and the top of the box
    - Langstroth – the standard in the US and other parts of the world
    - Smith

## Stand

- The hive should be raised at least a foot away from the damp ground to enable comfortable inspection and manipulation.
- Place the stand on a paving slab with gravel around to ensure stability and minimise weeds.
- The stand should lean slightly to the front of the hive to ensure rain will fall off
- Makeshift stands from a variety of materials are acceptable providing they are strong enough and allow for air to pass around the hive – breeze blocks with wood across or beer/milk crates are not uncommon.
- A stand is not difficult to make out of timber.

## Floor

- A plain board with a raised lip on three sides – bees enter the hive along the fourth side.
- Can be solid or mesh
  - Mesh (OMF – open mesh floor) or varroa floor
    - Allows debris and varroa mites to fall from the hive
    - Can insert a removable sheet to inspect the debris – in particular the number of varroa mites.
    - Concern over too much ventilation in winter
  - Solid
    - Prone to dampness in winter – leading to mouldy combs and/or pollen
    - Harder to spot varroa drop
    - Possibly improved ventilation in winter
- Recommended
  - Controversial, but open mesh floor is definitely more popular nowadays

## The Roof and Crown Board

- Crown board
  - Board that sits on top of the topmost box and immediately below the roof.
  - Has one or two holes
  - Can act as a clearing board or for use with a syrup feeder
  - Quilt – a glass or perspex cover that allows for visual inspection without having to open up
  - Can have a one bee space ridge
- Roof
  - Usually covered with roofing felt or a metal sheet (in wooden hives)
  - Sits above the crownboard
  - Overlaps the supers and brood box so most rain falls off roof onto ground
  - Can be flat or pointed
- Recommended
  - Crown board or quilt with bee space ridge and flat roof (other than WBC)

## The Queen Excluder (QE)

- A metal or plastic grid placed on top of the brood chamber
  - With or without a raised edge
  - Grid holes are xxx in size to allow workers through
- Stops Queen from laying eggs elsewhere in the hive
- Can remove honey without disturbing the brood or risk of damaging Queen
- Recommended
  - Metal QE with a one bee space ridge on one side

## The Brood Box

- Main area for raising new bees
- A square or rectangular box designed to typically hold 10-11 equal sized frames
- Bee space above or below the frames
- Will have plastic or metal runners on which the frames will be placed

## Supers

- Similar to the brood box, the super is a shallower box that holds frames used by bees for storing honey
- Bee space above or below the frames
- Can add or remove extra supers from hive as required
- Frames generally have more space between them than brood frames
- When full a super can weigh around 15Kg

## The British National

- Although the Langstroth Hive is the most widely used globally, the most popular design in the UK is the British National
- The original National was introduced in 1920 and was adopted by the Ministry of Agriculture as... The National Brood Box & Super. It was usually made of 7/8" timber and was 18 1/2" square. It could be made up with either TOP or BOTTOM bee space to suit the requirements of the purchaser.

1946 saw the first issue of British Standard 1300 which formalised the dimensions of and introduced the 'Improved National Hive'

The term Improved National Hive changed to 'Modified National' in 1962 as indicated in the MAFF leaflet 367 which you can get as a pdf here:

<http://www.peak-hives.co.uk/wp-content/uploads/2009/11/leaflet-367b.pdf>

## Measurement and numbers

- The following slides provide the 'vital statistics' for the four types of hives being discussed in this workshop
- Do not worry about the detail of the measurements – you may find it useful to refer back to these in the future
- Consider the other issues such as the number of frames, the brood area and the number of worker bee cells.

	National	Commercial	WBC	Langstroth
Bee space	Bottom	Bottom	Bottom	Top
Brood area in sq ins	2200	3000	2000	2750
No. worker bee cells	50,000	70,500	45,000	61,400

## Measurements and numbers National

- National Boxes 18  $\frac{1}{8}$ " square (external dimensions)
  - Standard Brood depth 8  $\frac{7}{8}$ "
  - Deep Brood depth 12"
  - Super depth 5  $\frac{7}{8}$ "
  - Bottom bee space
  - Brood area is 2200 sq ins
  - 50,000 worker bee cells
- National Frames
  - Standard Brood 8  $\frac{1}{2}$ " deep
  - Deep Brood 12" deep
  - Shallow frames 5  $\frac{1}{2}$ " deep
- No. of Frames in a box
  - 11 Hoffman (self-spacing frames ) – usually in the brood box.
  - 10 Manley frames in the super
  - 9 or 10 frames on castellated spacers in the super
  - 8 frames on wide ends in the super

## Measurements and numbers Commercial

- Commercial boxes 18  $\frac{5}{16}$ " square
  - Brood body depth 10  $\frac{1}{2}$ "
  - Super depth 6  $\frac{3}{8}$ "
  - Bottom bee space
  - Brood area is 3000 sq ins
  - 70,500 worker bee cells
- Commercial Frames - Top bars - 17  $\frac{1}{4}$ " and bottom bars 16" long
  - Brood 10" deep
  - Super 6" deep
- No. of frames in a box
  - 11 Hoffman frames in either a brood body or super.
  - 10 Manley frames in the super.



## Measurements and numbers

### WBC




- WBC 21 1/2" square external dimension of lifts
  - External dimension of brood body and super - 17 3/4" x 16 1/4"
  - Standard Brood body depth 8 7/8"
  - Deep Brood body depth 12 1/2"
  - Super depth 5 7/8"
  - Bottom bee space
  - Brood area = 2000 sq. ins.
  - 45,000 worker cells
- Frame sizes Top bars - 17" and bottom bars - 14" long
  - Standard Brood - 8 1/2" deep
  - Deep Brood - 12" deep
  - Shallow - 5 1/2" deep
- How many frames?
  - 10 Hoffman frames in either brood or super
  - 10 frames on narrow ends in the brood body
  - 9 Manley frames in super
  - 8 or 10 frames on castellated spaces in super
  - 8 frames on wide ends in super

## Measurements and numbers

### Langstroth

- Langstroth 20" x 16 1/4"
  - Standard Brood 9 7/16"
  - Jumbo Brood 11 3/4"
  - Super 5 3/4"
  - Top bee space
  - Brood area = 2750 sq. ins.
  - 61,400 worker cells
- Frame sizes Top bars - 19" and bottom bars - 17 9/16"
  - Standard Brood - 9 1/8" deep
  - Jumbo Brood - 11 1/4"
  - Shallow - 5 3/8"
- How many frames?
  - 10 Hoffman frames in either brood or super
  - 8 Manley frames in super

## Inside the Hive

Brood Frames	
Super frames	
Dummy board	

## Style of Frame

- There are a number of variations in the width of the top bar, the shape of the side bars and the design of the bottom bar.
- But - there two popular designs are Hoffman and Manley
- Hoffman - self spacing with shaped sides - usually used in the brood box
  - In National hives 11 Hoffman frames plus a dummy board in brood chamber are recommended.
  - Provides near optimum brood area and the dummy board gives readily available free space to assist manipulation when inspecting the brood.
- Manley - wider top bar, self spacing with straight sides
  - Reduces frame movement when transporting the super
  - Aids the uncapping process

## Frames

- British Standard frames fit a National or WBC hive. Side bars and bottom bars are also suitable for Smith hives.
- DN stands for Deep National and will fit standard size National and WBC brood bodies.
- SN stands for Shallow National and will fit standard National and WBC supers.
- DN1, DN2, SN1 and SN2 have straight side bars so these frames will have to be spaced.
- DN4, DN5, SN4 and SN5 have Hoffman side bars so are self spacing.
- DN2, DN5, SN2 and SN5 have slightly wider top bars.

## Short vs Long-Lugged

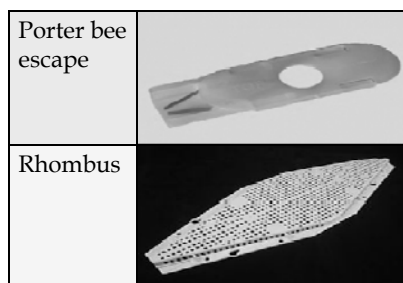
- Refers to the ends of the top of the frame that is used to lift it out of the box
- National frames are long lugged (38mm)
  - Can add spacers more easily
- Smith and Langstroth frames are short lugged (17-19mm)

## Recommendations

- All the hives we have discussed have pros and cons
- Some recommendations we can make:
  - Whatever hive you choose, go for
    - Hoffman brood frames
    - Manley supers
    - Metal runners
    - Avoid castellated spaces – especially in the brood box

## Rhombus and Porter bee escape

- Devices used to clear bees from a super before extracting honey
- Fixed over one of the holes in the crownboard and placed below the super to be cleared
- Bees can go down through the device but cannot come back up



## Warm vs Cold way

- As British Standard Hives are square in construction they will fit over the floor with the frames either perpendicular to the entrance or parallel to it.
- Cold way is perpendicular
  - Can stand either side of the hive to manipulate
  - a winter cluster will tend to progress across a set of frames starting from the centre and moving to one side.
  - This can cause a problem when they get to the side wall because the cluster is then as far as it can be from the remaining stores which can result in "isolation starvation" as they will not be able to leave the cluster, due to cold, to travel the few inches to obtain the rest of the stores.
- Warm way is parallel
  - Have to stand at the back to manipulate
  - Bees generally place their stores at the back of the hive and work their way from the front to the back as winter progresses.
  - Combs are completed more fully to fill the frame right down to the bottom bar thus reducing rounded corners.
- Recommendation
  - Cold way is more usual due to the ease of manipulation from both sides

## Choice of materials

- Wood
  - Cedar
  - Softwood
- Polystyrene

Pros	Cons
Polystyrene is light!	Not as stable in high winds
Extremely efficient insulator <ul style="list-style-type: none"> <li>• At least 2x "warmer" than wooden hives!</li> <li>• Preferred material for Nucs</li> </ul>	Hives require painting before use! <ul style="list-style-type: none"> <li>• UV light breaks down poly!</li> <li>• Flimsy crown board</li> </ul>
Impervious to water and damp	Sterilising hive parts is not so easy
Cheaper than most wooden equivalents	Require slightly different handling processes
Some say ... Better for bees	Some say ... Don't look as good as wooden hives

## Positioning the hive

- Ideally facing South and at least 3ft apart
- Preferably not under trees – bees don't like dripping water on the hive and a lack of circulating air can lead to dampness – a bee's worst enemy!
- Avoid electric overhead wiring which bees do not like
- The flight path of bees is generally 15-20ft above the ground so placing the hive facing a hedge about 6-12 ft away means they fly up and away from the hive rather than ascending across the lawn at head-height!
  - Consider using fencing if no natural hedge is available.

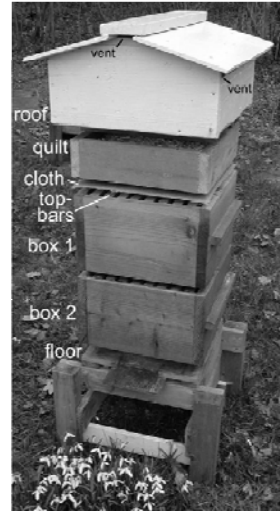
## Hives for special jobs

- Collecting bees
  - Skep
  - A box
- Nurturing a new colony
  - Nuc
    - Size options
- Queen rearing

## Other hive types



Top bar



Warré

Dadant



## Other hive types



Smith

Observation



Zest