

# Patterson's Page

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*What distance do your bees have between sealed brood combs? Are your bees crowded? Cramped conditions could increase their vulnerability to disease. Roger prompts us to think about the gaps between combs, both for brood comb and super comb. Do you 'mind the gap'?*



Measuring the bee space between sealed honey cells. Photos by Roger Patterson.

I have removed or been involved in removing many feral colonies from trees and buildings over the years, certainly well over 200 of them, sometimes several on the same day, such as on Monday 15 April 2019 when four were removed from a barn in West Sussex. Many people will consider these to be wild colonies, and although I have often used that term I prefer 'feral', because I believe that all colonies now in the UK that have selected their own home have originated from managed colonies in some way.

In removing these feral colonies I have learnt a lot about how bees behave when they make their own decisions that are not influenced by man. For several years my presentation on this topic has been one of the most popular. In 2017 I gave a presentation at the National Honey Show (NHS) that was videoed and it can be found on the NHS website.

## Precision in comb building

Bees are very precise when building comb, not only when constructing the individual cells, but in the spacing of combs, where the distance between combs is usually very consistent. I regularly measure the distance between combs, centre to centre, where I find they are usually 36–38mm apart. Why this variation, even though it is quite small? Perhaps it is because this is as accurate as bees can manage, bearing in mind the cavity of a natural nest is not often a flat or regular surface such as they get in a manufactured hive. Alternatively, it may be a consequence of the natural size variation in worker bees of different subspecies, so colonies build their nest to suit the size of their local worker bees. Where the cavity is an odd shape or the bees fill a gap to make best use of the space, the gaps may be different sizes from those between larger, parallel combs. Having spent all my working life as a precision engineer it has always amazed me how accurate bees are when constructing their nest.

## Wide and narrow spacing in managed combs

This brings me to the real point of this article: the spacing of combs. In managed colonies beekeepers use two main sizes of spacing, that we refer to as 'wide' and

'narrow'. Narrow spacing is used for brood frames and super frames fitted with foundation. When the super combs are drawn out fully they are usually extracted and then transferred to wide spacing. It has long been known that if drawn comb is put on wider spacing the bees will extend the cells that are to be used for honey storage. This means that comb containing stores can vary in width. Comb containing worker brood, however, is fixed at two lengths of sealed cell plus bee space.

## Comb size with sealed worker cells is constant in my colonies

For this article I have measured several combs in several colonies with sealed worker brood on both sides. I found the width is consistently 25mm with the bees in my hives, irrespective of the age of comb or the spacing. I obtained the measurement by pushing a cocktail stick through combs containing sealed brood on both sides, making a mark on the stick and measuring it.

## Narrow spacing varies

Narrow spacing varies depending on such things as the country, manufacturer and the hive design. British spacing for narrow WBC metal ends, the old Abbot self-

*“Bees are very precise when building comb, not only when constructing the individual cells, but in the spacing of combs, where the distance between combs is usually very consistent ... from centre to centre, they are usually spaced 36–38mm apart.”*

spacing frame, Yorkshire spacers and castellations is 38mm (1½ inches). American Langstroth and British Hoffman spacing is 35mm (1 3/8 inches). Interestingly, the American Dadant is 38mm. WBC metal ends have largely been replaced by plastic ends. I have measured several in my possession that have been acquired from various sources, which vary between 35–38mm depending on the manufacturer.

### Bee space varies in accordance with narrow spacing

In a natural nest, the bee space between the faces of two combs, based on my measurements, is 11–13mm. The bee space measurement with 35mm comb spacing is 10mm and with 38mm spacing is 13mm, a 30% increase. Although these are observations from one beekeeper without making records, I have noticed that there seems to be a higher level of Chronic Bee



Hoffman frames spaced by castellations showing the difference in the space between combs.

Paralysis Virus (CBPV) in colonies spaced on Hoffman frames (with 35mm spacing)

than in those housed on 38mm spaced castellations, which many beekeepers in my area use. We are told that CBPV is aggravated by crowded conditions, so I am wondering if bees that have to live in a hive with smaller bee spaces are more vulnerable to this. Perhaps this is a small research project for someone.

### Bee space between sealed super combs

I have measured the bee space between sealed cells of honey and it is usually between 5–7mm, occasionally up to 8mm. This is understandable as there are far more bees that cover brood than sealed stores.

I realise this is only a small sample, but it is an example of simple experiments that all beekeepers can do. I hope to cover further experiments in future articles.

*“If drawn comb intended for honey storage is put on wide spacing the bees will extend the cells. This means that comb containing stores can vary in width. Comb containing worker brood, however, is fixed at two lengths of sealed cell, plus bee space.”*

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