

Splitting Diary – 2021

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Last year I stated that the 2020 splitting season had been a time of upheaval. Well, it seems that 2021 turned out pretty much the same. With the madness of COVID still around and La Niña in full swing it made for quite a tumultuous time. If there's one thing anyone can say about the Ku-ring-gai native bee splitting season, it's that it is never boring!

Introduction

The original plan for this season was to convert the final cohort of our old OATH hives and turn them into our new, all-timber KOATHs and then split the rest of the KOATH on the schedule as usual. Although we partially managed the latter, we had to abandon the former completely. I'll go into the reasons for this later but to sum it up it was a combination of COVID restrictions and materials shortages. The season was still a success and we still distributed a full compliment of hives, but I had hoped to get a lot of extra work done this season which would have laid a lot of groundwork for the future.

New Approaches

One of the major challenges of the native bee program is storing the sheer number of hives we produce each year. Once a hive is split it can't be instantly distributed, as it needs time to recover and needs to be in a location where it can be easily monitored. The site we have always used for this is our native plant nursery and it works admirably as a bee nursery as well. At the end of a splitting session hives would be brought back to the nursery and then spread across the site. This is all well and good but in the past, there was no map of the site and those bringing hives back would just place them randomly. This was not only incredibly inefficient, making very poor use of the available space, it was also slow as one never knew what spaces were still available. On top of that, it often led to hives being placed in inappropriate places.

So, this year I decided to map the entire site and physically prepare appropriate spots for hives. This meant that the locations where hives should be placed was clear and allowed me to calculate the precise number of hives we could keep on site. The site was then broken down into zones, with each individual splitting session assigned to a zone. This way, when a team returned from a splitting session they knew exactly where to place their hives. This not only made the end of the day so much quicker and increased the number of hives we could safely accommodate, it also made the later distribution of hives easier as well, as we knew the exact location of every hive on site.



Top: The map of the main nursery and propagating shed. We've always stored hives here but in no set pattern. The zones mean that we can have designated areas with exact numbers, making the whole hive storage process far easier. Bottom: This is a new area of the nursery that has previously never been used to store hives. It is a large area and has allowed us to spread out more on site and support more hives during the busy split season.



Season Prep

As always, the preparation of boxes for the season is a big job. This has always been done by hand and is reliant on the help of volunteers. COVID-19 however made the recruitment of volunteers incredibly difficult, and painting by hand alone would simply never have gotten the job done. So, this year I invested in a paint sprayer. This nifty bit of kit allowed me to paint the same number of boxes as three people by hand.

The Ku-ring-gai Community Workshop also kindly made me a lazy Susan (basically a rotating turntable), which meant I could spray each side of the hive and simply turn the wheel to get to the next side. Volunteers will still be key to helping us prep for the season, but the paint sprayer really helped this year.

Challenges

COVID - Workshop closure, material limitations

Similar to last year, COVID-19 introduced its own challenges. Many of the same challenges that we had to deal with in 2020, increased logistical complexity for example, were similarly present this year and although frustrating we were prepared for it given last year, and so these came as no surprise.

However, one of the bigger problems was another workshop closure, this time for much longer than previously. This meant that once again we weren't able to create as many boxes as we needed. Doubly frustrating, was that we were unable to complete our new pine hives which would have been introduced for the first time this season. Fortunately, I had prioritised the production of the original KOATH hives, which meant that we still had enough hives to fulfill the program needs. Just.

Given the relaxation of the rules now in NSW it is not likely a prolonged workshop closure will be a problem in the future, but it does highlight the importance of getting orders in early just to be safe.

Spacer hives

Now, last year I mentioned the Franken-OATH, a hive that was made up of two different halves and so couldn't be retrofitted. Well, this year we had the KOATH equivalent, the spacer hive.

The spacer hive occurred due to the original retro boxes being the incorrect depth, resulting in the OATH that sits inside sitting higher than the rim of the retro box. This meant that the normal KOATH top wouldn't fit and left a huge gap between the hive halves.

Unfortunately, instead of going back to the drawing board and fixing the problem at the source (redesigning the retro), a quick fix was utilised by putting wooden spacers into the gaps. This essentially raised the lip of the retro box so that the OATH fit correctly and allowed the KOATH top to sit on as it should. Problem solved right? Actually, no, problem created.

Although the spacers enabled the OATHs to be converted, they introduced a raft of new problems and only really kicked the can down the road. The spacers were unpainted plywood, so they rotted extremely quickly and also acted as a route through which water was able to seep into the hive. This caused many of the hives to rot from the inside out and I've had to transfer a number of colonies from such boxes to new ones. They're also a nightmare to split as the spacers disintegrate or move inappropriately, creating still more gaps.

This problem was one I knew was coming up ever since I took over the program and saw the results of these spacers for myself. However, much like the Franken-OATHs, there was no record of how many hives had been fitted with these spacers and it was only during the 2021 splitting season that I was able to get a true handle on how many there were.

I had come up with a solution, however. I modified the standard KOATH top so that it contained a recess into which the OATH in the bottom retro would fit. Essentially, this was exactly the same as having spacers, only that in this case the spacers were pre-attached with nails as part of the box's original construction and then painted. This meant that they would not rot or come loose as they were part of the KOATH box itself. These were coined spacer boxes.



The images above show how the spacer box creates a recess around the inner lip of the hive to allow for an OATH that is standing proud of a retro box to slot in nicely, and so still allow for the hive to be split.

I had however only assumed that there were a handful of these spacer hives in existence, but when it became clear that the problem was far more prolific, I was forced to convert more of the KOATH halves into spacer boxes. Doing this on the fly was a pain and it did mean the splitting teams had to always carry more boxes than they technically required, but the result was that no hives with raw plywood spacers were left at the end of the season meaning the problem has been removed. There will be a few more out there, but the bulk were completed this year so I'm confident that we'll be seeing a lot less of the old spacer hives going forward.

Too many hives!

Not so much a challenge as a change, the program has now reached a point of saturation in terms of the two splitting schedules. Historically, we have split hives every two years, but now the program has reached a level where that is not sustainable, and we'll have to look at changing to a 3 year schedule. For example, over 350 hives were scheduled for a split this year, simply too many to be done in one season.

Cursed tape – again!

I'm actually a little embarrassed by this one. Last year I complained extensively about the poor quality of the tape we were using. It fell off almost instantly or simply didn't stick at all and I vowed to find a better alternative. I took a series of different tapes and tested their performance, finally whittling them down to the best one. The tape in question had great adhesion and stayed in place for as long as I needed. I hadn't considered however that the tape may stick *too* well.

With the really wet and humid weather we had this season, mould would be a real issue and beneath the tape on a box is a prime spot for mould growth. As such, I decided to remove all the tape from the hives about 4 weeks after they were first split. It was only when attempting this that I realised that the tape had degraded, but not to the point of falling off, it had actually become too sticky and had become very hard to remove.

All the masking tapes we've used have been standard i.e. not designed to be used outdoors. I had hoped to avoid the use of outdoor grade masking tape as it is significantly more expensive, but given the extra time I had to spend meticulously removing the tape this year I think it is time to bite the bullet and use tape that is graded for outdoor use.

Retrofit delays

I've touched on this briefly already, so I won't dwell on it, but the retrofit delays were quite the disappointment this year. With the closure of the workshop, the matching pine KOATH could not be made and so although I had all the pine retro boxes, I didn't have matching tops.

This meant all the OATH hives due to retrofitted this year were not, meaning they will now have to roll over to next season. This might not sound like an issue, but all hives run on an automatic splitting schedule. Essentially, our database automatically schedules a split for a hive

based on its creation date and raises those jobs in our systems. However, because all the OATH were delayed, these will need to be manually adjusted to edit their splitting regimes for next season. Not a difficult task but a time consuming one.

Innovations & Tweaks

New paint

Onto happier things, the green paint is finally gone! Well, not completely gone, but it is certainly in the process of clearing out its desk. I've been wanting to change the colour of the Kuring-gai hives since I started, and this year I began that process. I changed the hive's colour from the sickly green to a far more acceptable cream (Spanish Cream Half if you'd like to know).



The box above is still the standard KOATH (with minor adjustments to the feet to make them stronger and able to accommodate a pitched roof). The new colour makes for a more neutral appearance and in my opinion a more attractive one too. For the first few seasons, hives will be half cream and half green, due to the splitting process, but in time the green hives will be siphoned out and all residents will have the full cream colour.

In fact, the colour change wasn't purely due to ascetics, although that was my first thought. Paler colours, particularly whites or pale yellows, have far better reflective properties and therefore reflect far more heat. This will be helpful when it comes to those hot summer days.

Rooves

This was the most significant addition to the program this year and one that I am very happy has finally come to pass.

Previously, we had always stressed how important it was to have a roof on a hive, but we didn't provide one for the residents, always relying on them to get one themselves. This resulted in a mixed bag, some good some bad, as well as those who simply didn't bother.

There have been a number of attempts in the past to create rooves, with mixed success, and none of the designs ultimately went on to be a permanent part of the program. I decided that we needed to create something durable and self-attaching so that there was no additional work to do to get the rooves to work.

Many of you reading this may have seen the pitched metal rooves that are commercially available for OATH hives. Usually made of Colourbond steel or similar, they rely on tension to keep them attached to the hive. Unfortunately, these rooves don't fit our hives as ours are too large. So, taking this concept (and employing Pythagoras' Theorem for the first time since school) I extrapolated the design to fit our larger hives.



Right: this is the standard available tension roof for OATH hives. Easy to get hold of and effective, these rooves are very popular but simply don't fit our hives. Left: This is the new roof. Very similar to the commercially available version, it is simply scaled up to fit our larger hives. The different peak design simply reflects the easiest way for the manufacturers to produce the tension required.

It was surprisingly difficult to find a sheet metal fabricator who could actually do the job, as apparently the tight angles mean it is very difficult to make, requiring special equipment. However, I was able to find a firm that could do the job, Lotus Steel, and the program now has bespoke rooves that fit our hives. These rooves will protect the hives from the sun and the rain, and will likely outlast the hive boxes themselves.

Not only that, but all hives at our nursery site now all have a roof. Not necessarily one of the new ones, but no newly created hive will ever be without a roof going forward.

2020 outcomes

I wanted to also mention some of the outcomes of certain changes made in the previous season, just to show how these have improved things this year.

Splitting protocol – mortality

Last season (2020) was the first year that the official Ku-ring-gai splitting protocol was introduced. It was a learning curve for everyone and involved the adoption of some new techniques and the breaking of some bad habits.

This year however, I really feel that it has made a difference. Everyone is more confident in what they have to do in any given situation and the protocol gives everyone something to fall back on for reference. It also keeps everyone to a standard and means that every hive is split right every time.

This improvement in best practice has been reflected in our hive mortality rates. Of the 161 new hives created this year we lost only 3 (as of March 2022). That's a success rate of over 98%.

Labels & Pens

Alongside the tape issues of last year was also the problem of labels falling off and pens fading. I sourced a new supplier for our labels and purchased industrial grade marker pens that are weather and UV resistant which has made a world of difference.



Left: Old sticker. Right: New sticker. Although the design differs slightly, the aim of finding a new supplier wasn't an aesthetic one, simply to improve adhesion. The new stickers show far greater performance and we no longer need to worry about stickers peeling off.

In short, the labels stuck, and the writing didn't fade, assuming that those writing on the labels used the pens provided... you know who you are.

An additional back up was to place a piece of tape on the top of the hive, beneath the roof, and write the parent hive details on it (thanks to Kim Griffin for this one). This meant that in the rare case where a label did fade, it was still easy to work out what hive it was and reapply the label.

Route planning

Proper route planning is now so obvious it's a miracle we ever got by without it. When combined with the nursery mapping and the use of the CiA software (see below) it is now very rare that a splitting day extends long into the evening. The time these little adjustments make add up and make for a huge additive improvement in efficiency.

CiA

Despite the name, CiA is not a spy agency, but a mobile version of our database which we use to store all the information about our hives.

Although the software had been around for a while, I introduced its total use last season. It was of great benefit, but it is a learning curve, and it takes a bit of time to get to grips with it.

This year though, all the teams were comfortable in its use and it significantly improved our data handling. All new hives had assets (entries in our database) created for them on the day they were made, and all residents hives were updated on the day too. So, no more sheafs of paper with poor handwriting on, no more having to create hive assets weeks after they been done and struggling to find the correct data. Everything is done in real time which not only dramatically improves data accuracy, but also reduces workload at the end of a season as it is no longer necessary to go through all the paper sheets to create hive entries in the database.

Summary & Stats

In summary, it was another challenging but successful year for the Native Bee Program. Our popularity is still high, and our hives are still in demand. It is unknown how some of the challenges these past two years have brought will change over time. It is likely that the effects of COVID-19 will be with us for a while yet, both in terms of the logistical challenges but also in likely materials shortages going forward. Whatever is thrown at us however, we will continue to develop and innovate on the program and deliver something that the people of Ku-ring-gai can be proud of.

Hives scheduled to be split:	219 (of the >350 due)
Hives successfully split:	161
Hive replacements required (from previous season):	26

Acknowledgements

Once again, the biggest thanks of all goes to all the volunteers that help me with the splitting season. They give up their time to help us prepare and split hives and without them the program couldn't run. So, thank you to Steph Robertson, Kathy Bradfield, Rod Sharples, Gai Emmerson, Fay Knibbs, Casey Forster, Vaishnavi Sathyakumar, and Jim Mitchell for all their help this season.

Of course, I couldn't make the split season a success without the help of some of my colleagues. So, another big thank you to Lindy Williams, Kim Griffin, and Haley Henning, all of whom lead splitting teams this season.

As always, although for the last time this season, a great big thank you to Francisco Garcia Bulle Bueno from Sydney University, who once again did nearly 90 hours of splitting this season. Both myself and the program as a whole will miss him dearly next season.

Although we didn't have to send our hives to foster this year, I'd still like to thank those who look after hives for us when we need it. So, thank you to Lian Vohralik, Rosemary Coucouvinis, Jim & Janet Harwood, Julie Thiele, Julia Eagles, Julie Wethered, Jocelyn Chenu, Gai Emmerson, Kathy Bradfield, Lindy Williams, and Sue & Bob Ballinger

Finally, a heartfelt thank you to all the members of the Native Bee Program in Ku-ring-gai. As always, the residents of Ku-ring-gai are accommodating and understanding and if not for their support, the program would cease to be. Thank you all.