

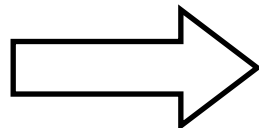
Splitting Diary – 2020

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The splitting diary is back! The last proper diary was written back in 2017 and it was about time it got resurrected. The 2020 season was a time of great upheaval, coming off the back of a horrific summer and then the additional inconvenience of COVID-19 restrictions it was quite the season for my first year at the helm. However, despite adversity, and with the help of my fellow team members Lindy, Kim and Haley, a good friend Francisco Garcia Bulle Bueno (University of Sydney), and a raft of excellent volunteers, we made the season a great success.

Introduction

The primary task for this season was to finally put the nail in the coffin of the foam box. The original hives on the program were OATH (Original Australian *Tetragonula* Hive) boxes encased within a polystyrene box. They were instrumental in getting the program off the ground but they have a long list of issues around practicality and sustainability. The KOATH hive had been introduced 3 seasons prior but due to the higher materials demand and logistical challenges OATHs still made up a large proportion of the hives. So, I decided that this year we'd bite the bullet and convert all OATH scheduled for a split into KOATH. This would be the first year of the two year total conversion timeline.



From OATH to KOATH

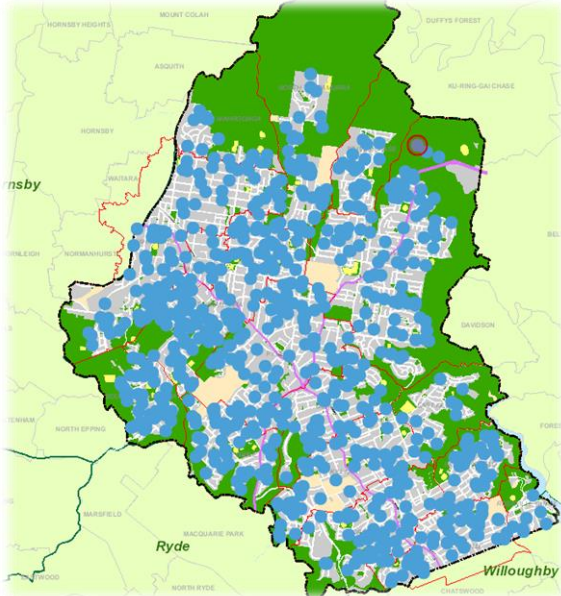


The decision to retrofit all the OATH for that year would mean an increase in the amount of materials we used (as a full retrofit uses 2 retro halves and 2 KOATH halves) and an increase in workload. However, it simply had to be done and the payoff in a couple of years' time would be far more efficient split seasons (KOATH take a fraction of the time to split compared to OATH) and far less confusion by having only a single hive type.

New Approaches

Some of the major new approaches this year were based around logistics, repeatability and data accuracy.

Organising a split season is no simple task and requires a huge amount of logistics to pull off. However, there's no reason why this can't be made as efficient as it can be and so introducing little tweaks here and there could save quite a bit of time. One such tweak was in route planning. All the addresses that are due to be visited are shown on a map and then grouped into cohorts. This year we went a step further and used GeoCortex (a mapping software) to create the most efficient routes within those groups, minimising travel time and making the entire day more straightforward. In addition to this, full equipment lists we're made for each splitting team so that each team would always have the right components for any given day.



A map of all our active hives at the time of splitting (over 650). Approximately 250 of these were scheduled for a visit so, as one can imagine, ensuring that this is done as efficiently as possible is critical to avoid unnecessary loss of time

One particular thing I was also keen to introduce was a proper written splitting protocol. To date there was no official method and this meant that slight differences in technique were being used by different teams. In collaboration with Francisco Garcia Bulle Bueno from Sydney University, and in consultation with previous volunteers, I drafted a splitting protocol outlining the official Council method for splitting hives. This allowed for uniform technique across splitting teams but also made for a great teaching resource for training new volunteers.



A lovely KOATH retro split

This year, we all used the CiA software to record the data from the splits directly into our database via a tablet. Although this had been available previously it had been used sporadically which often resulted in having sheaves of paper at the end of a season that needed to be inputted manually. By enabling each team to input data as they went along this could be avoided and also meant that all hives could be recorded in the database, both current and new.

One final thing I'd like to mention is the new way we determined which residents would receive a hive this year. This year we trialled the Bee Lottery as opposed to the traditional wait list. The reason I wanted to change this was due to the overwhelming interest in the program and the feedback from residents from previous years. Previously, the waitlist would open in June and within the space of week would be full and so it would have to be closed. This is a very small time window and a lot of residents missed out. So, instead of this very small time window I decided to have the waitlist open from June till November, allowing any and all residents who were interested to put their name down. I then essentially drew names out a hat to determine who would receive a hive. We had over 500 individual households enter the lottery this year displaying an overwhelming demand for the program. This confirmed for me that I couldn't continue with the old first-come-first-served waitlist, as with that much interest some residents would have to wait the best part of a decade to get a hive. So, although some people will unfortunately not get a hive when they enter the lottery, everyone who enters has a fair chance of receiving a hive.

Season preparation

A prerequisite for ensuring that the splitting teams always had the correct components to split every hive was auditing the current program portfolio. A recurring problem in the past had been inaccurate data entries for hives, which often led to teams arriving at an address only to find a different type of hive than was meant to be there. This seemed to almost be exclusively KOATH listed incorrectly as OATH so part of the prep of the season was to audit all listed OATH hives to check what they really were. Though time consuming this meant that the data accuracy could be improved and also meant that splitting teams encountered no surprise hives. It also gave me the opportunity to give the hives a once over whilst auditing and get a better idea of the health of a large chunk of our hives.

Staff and volunteers busily painting the new KOATH hive boxes



Materials prep this year was to be particularly challenging. Due to the decision to retrofit all OATH that were scheduled to be split, twice as many components for each of the OATH hives needed to be prepared. A usual split requires two empty hive halves, whereas a retrofit requires 4 (2 retro halves and 2 KOATH halves). So, this meant twice as much painting and twice as much stacking. However, with the help of colleagues and an ever gallant troop of volunteers we were able to prep all the materials in time for the start of the season.

Challenges

COVID-19:

Well I guess it was inevitable that COVID would feature somewhere in here. COVID has made *everything* difficult for the entire world but, specifically for the split season, we did have to do a few things differently this year too. Previously, we would rely on email to inform residents that a split was due and usually residents would respond to say whether the proposed time would work. If no response was received we were still able to visit the property on the day and ask in person. Due to COVID however Council staff were only able to visit premises with the expressed permission of the resident. This meant that we had to put in a bit more work on the preparation side by following up emails with phone calls, which may not sound like much but when there is over 200 individual residents to visit that can mean a lot of phone calls! In addition to this of course was all the additional hygiene measures that we needed to implement to ensure that our activities were abiding by any given COVID-19 guidelines. So, as you can imagine, this added an extra layer of complexity to what is already a challenging logistical task.

COVID also made volunteer recruitment difficult, particularly during the middle half of the year when hives needed to be painted. We were able to find enough hands to finish the job but I relied on a few of my colleagues to chip in when no volunteers were able to help.

Another huge impact of COVID-19 was the temporary closure of the Ku-ring-gai Community Workshop (KCW). This closure happened slap bang in the middle of construction season and meant that we couldn't create as many KOATH boxes as we wanted this year. As a result we tactically created a number of new OATH hives despite the aim of full retrofitting. However, this actually worked out, as we had a large supply of already painted foam boxes and OATH halves leftover from last year and were able to syphon off new OATHs to the sales side of the program, leaving a fresh KOATH at resident's properties. This half retrofit worked well and meant that OATH were still removed from the program without us running out of materials.

Franken-OATHs:

What is a Franken-OATH I hear you ask? Well this term was coined this year and essentially refers to those OATHs that aren't compatible for a retrofit. During the very early days of the program a myriad of different OATH boxes were used from a number of manufacturers up until a standard design was made by the KCW. The retrofit kits for converting an OATH to a KOATH only fit the standard OATH boxes made by the KCW, and not other random OATH boxes. The fact

that some of these non-standard OATH halves were in circulation was no secret but the sheer number of them we found was a surprise. Whether a particular hive had one of these non-standard hive halves was not recorded at the time of their creation and it is very difficult to tell whether one is present without removing the hive from its foam box. This meant we got a few surprises when opening the polystyrene on many of our OATH hives.



Surprise! It can be hard to tell what's waiting inside a poly box. This 'Franken-OATH' is now retired and lives at our nursery. This image shows that although the top half could be retrofitted, the bottom is just too big. It's still an OATH though.

To solve the problem we were forced to make more new OATH hives that we intended. However, we were fortunate enough to have successfully split enough hives that these could be syphoned out of the programme so that they would not be redistributed to new residents. Teams were then swiftly assigned spare components for making fresh OATH hives should they encounter any of these Franken-OATHs during the rest of the season.

Cursed tape!

We had a few issues with tape this year. Finding a reliable, and financially viable, tape for use during the splitting season has been a challenge previously and it seems that it remains. The masking tape that we used from Bunnings had quite poor performance when it came to sticking to the KOATH hives, often falling off too soon and leaving hives vulnerable. The gaffer tape, also Bunnings, was equally poor showing very patchy adhesion to the KOATH. This meant we often had to apply multiple or repeat layers of tape to ensure hives were protected. The wetter weather during the latter half of the season, whilst the hives were recovering from their split, certainly didn't help but the fact remains that a more reliable tape must be found for next season.

Hive labels:

The hive labels were the bane of my life this year, them and the pens used to write on them. As previously mentioned, we used the CiA software this year to record all data in relation to

hives. This included all the new hives that were yet to be assigned to residents. All new hives were given a unique number which referenced their particular entry in the database and this number was written on labels which were then stuck onto the hives. However, this simple and effective system was undermined this year by the fact that the labels' adhesion was very poor and the writing on them seemed to fade rapidly. This meant in some cases that lengthy detective work had to be done to work out which hive was which. The idea of recording the hive's data as soon as it is made as opposed to after it is delivered to a resident is sound and will continue, however I am now looking at better, more resilient pens and labels that can survive the harsh Aussie sun and remain adhered to the hives.



Prematurely peeling tape (left) was quite a problem this year. Labels fading (bottom) or falling off completely were also an irritant. Next season, finding better alternatives is a must

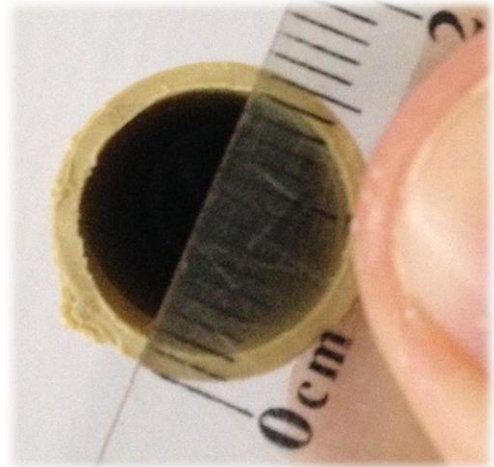
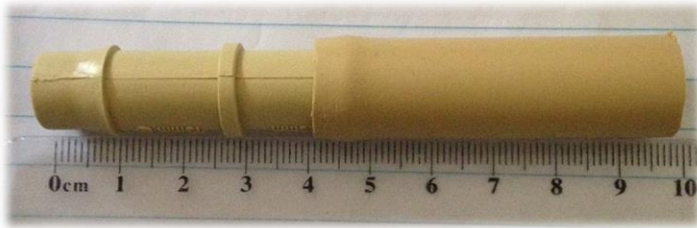


Innovations

More of a tweak than an innovation, I altered the entrance slightly on the new KOATH halves made this year. Previously, a 15mm hole would be drilled in the KOATH as an entrance, within which a piece of 13mm (internal diameter) irrigation hose was inserted and then inserted into this was a 10mm (internal diameter) barbed joiner. However, this seemed a bit complicated and I wondered why we didn't just use a longer piece of the 13mm irrigation hose. Previous tests had apparently shown that the hose had perished in the sun due to UV exposure. However, I was able to find a UV-protected version of the hose that only cost a few cents extra and so for the new KOATH we ditched the joiner and went for longer pieces of hose. This not only made the hives simpler to construct it also made them significantly better value, the longer piece of hose cost something in the region of 5c per hive half, whereas the joiner was around 70c. The new hose

pieces are doing well and have shown no sign of wilting in the sun. The 13mm irrigation hose is also more in line with the entrance diameter recommended by Tim Heard.

The new tube is now slightly wider at 13mm but now matches the recommended entrance diameter (Right). The previous set-up (below) had the barbed tube sticking out of the hose, with the hose being completely inserted into the wall of the hive



Feedback from residents is regards to the bee program is unfailingly positive and that's one of the major reasons that the program has such support here at Council. However, one of the only quibbles has been appearance. Residents often say how much they love their bees but that they wish the boxes weren't quite so... well, ugly frankly. Although the KOATH is certainly an improvement in that department over the original OATH it is still towards the bottom of end of aesthetic appeal when compared with many commercially available hives. Although I don't believe in form over function, I saw an opportunity to address this by designing a hive that doesn't rely on foam at all (more sustainable and plastic free) whilst simultaneously solving the looks problem.



Personally, I like the all-wood hives that maintain that natural wood look and so I wanted to see if this could be done for the Ku-ring-gai hives. Previously, materials cost had been highlighted as a reason why all-wood hives weren't possible, however, with recent increases in foam prices and a simpler design for the all-wood hives the cost difference was negligible.

The prototype here (left) shows what's possible for the Ku-ring-gai hives

I think we'd all agree that the prototype looks far better than the current KOATH. At the moment there are only two in existence and they are going strong. Next season I plan to conduct a larger trial, a *beta* test if you will, to get a more reliable bank of performance data as they still need to provide everything the bees need. This will enable me to gauge whether the new hives are suitable before rolling them out to residents. Assuming all goes well residents could possibly expect to see these hives in the 2022 season.

There is, unfortunately, a caveat. After much deliberation and a few tests I've decided that it is unlikely that I will be able to use wood stain for the new hives. This is mainly due to the need to reapply every few years (as little as every 5 years perhaps but on a program of over 700 hundred hives I just wouldn't have the time) whereas as paint can essentially last for decades. So, the hives will likely be painted, losing some of that natural wood appeal. However, I do vow to replace our current green paint with something far more attractive and residents will be (I hope) far happier with the aesthetics of the hives going forward.

Summary & Stats

In summary the 2020 season was a challenge but despite adversity we completed another successful splitting season. We made excellent progress on removing the foam boxes from the program and after next season there will likely be only a negligible number of foam boxes left in the program (due to a small few not being ready to split).

Hives scheduled to be split:	262
Hives successfully split:	212
Hive replacements required (from previous season):	31

Acknowledgements

The running of the bee program may fall to me but I'm by no means a one man band and the program couldn't run without the help of fellow Council staff and dedicated volunteers. So, I'd like to say a big thank you to Lindy Williams, Kim Griffin and Haley Henning for leading splitting teams and chipping in with the painting.

Another big thank you to all the volunteers who helped out this year, namely Kathy Bradfield, Sue Patterson, Emerson Huuk, Steph Robertson, Rod Sharples, Diane Norris and Mark Ponniah. All of whom helped either by splitting, painting or both.

Although not common knowledge, we also have a number of foster carers who look after some of our bee hives when we run out of space at our nursery. Without them we wouldn't be able to supply the number of hives that we do. So, a big thank you to Lian Vohralik, Rosemary

Coucouninis, Jim & Janet Harwood, Julie Thiele, Julia Eagles, Julie Wethered, Jocelyn Chenu, Gai Emmerson, Kathy Bradfield, Lindy Williams, and Sue & Bob Ballinger, all of whom fostered hives for us this year.

An especially big thank you goes to Francisco Garcia Bulle Bueno from Sydney University, who lead a splitting team, did over 90 hours of hive splitting this year, and whose knowledge was instrumental to the creation of the Ku-ring-gai hive splitting protocol.

And a final thank you to all those on the native stingless bee program! You are all unfailingly accommodating and genuinely love your bees which is not only a pleasure for me to see but is also a great comfort knowing that they are being looked after.