'Do It Yourself'

Boxing and Splitting Hives

Second Edition — PDF eBook

Anne Dollin & Russell and Janine Zabel

Boxing and Splitting Hives

2nd Edition (PDF ebook) 2017

by Dr Anne Dollin —
Australian Native Bee Research Centre
&
Russell and Janine Zabel —
Zabel Beekeeping Australia

Native Bees of Australia Series
Booklet 9

An Australian Native Bee Research Centre Publication

All photographs are by Les and Anne Dollin, except where otherwise acknowledged in the text.

FRONT COVER
Russell Zabel, preparing to box a nest of Australian Stingless Bees.
Photograph courtesy of R Zabel.

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Contents

Preface to the Second Edition

From Russell and Janine Zabel...

During the past 30 years we have improved our methods for keeping native bees. Our experience comes from the time we have spent in remote communities, teaching beekeeping to the indigenous people of northern Australia, as well as managing our many hundreds of colonies. We believe our methods of keeping these bees work very well. We keep colonies of *T. carbonaria, T. hockingsi* and *A. australis*. We have also had experience with *T. mellipes, T. clypearis, T. sapiens, A. cassiae* and probably *A. magna*.

The main change we have made to our methods is in the thickness of the box walls. The 45 mm thickness may seem a little large but our recent hot summers have proven that this extra thickness insulates the colony much better than the thin plywood versions. The box might be a little heavier but the added protection is worth it!

We are also very proud of the hive locks that we have produced. We were always frustrated with the older methods that we used. We now have a foolproof fastener that has been thoroughly tested by time. We produce these by the thousands.

Thanks for purchasing this booklet. We hope that you find it useful. Please follow the steps and recommendations provided, to ensure you carry out a successful native bee procedure. If in doubt, just call! Our contact details are on page 18.

The two major changes that Russell and Janine have made to their hive equipment, since the first edition of this booklet was published, are as follows. **Please note that some other photographs in this booklet show the original versions of this hive equipment.**

1 The wall thickness of their hive is now 45 mm.
To help the stingless bees cope with extremes of heat and cold, Russell and Janine have increased the wall thickness of their hive box design to 45 mm, as shown in the photograph on the right.

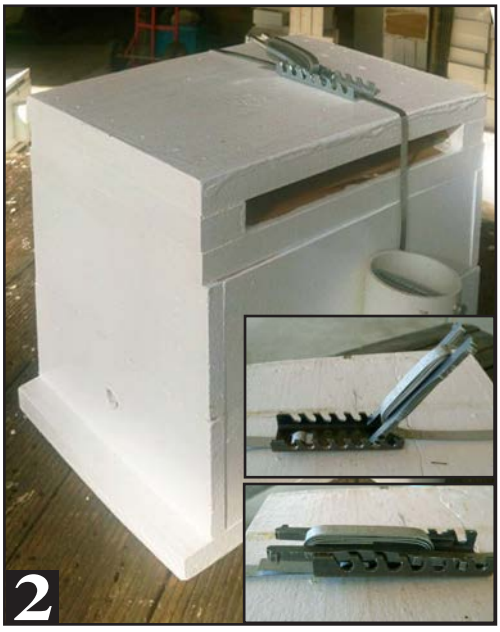
The tropical hive roof and the floor board of their hive are still constructed from 22 mm timber.

2 They now use a galvanised hive lock to fasten the sections of their hive together.
Russell and Janine no longer use a rubber fastening system for their hives as they found that the rubber perishes in the sun. Instead they now use a modified honeybee hive lock, as shown in the photograph on the right. The two inset photographs show detail of the locking system.

This lock is a scaled version that is sized to suit stingless bee hives. The strapping is 1600 mm long. The hive lock can fasten single, double or triple storey hives, simply and easily. For durability, the parts are galvanised.

These hive locks for stingless bee hives can be purchased through Russell and Janine's website: **zabel.com.au**

We hope that the detailed advice provided in this second edition of *Boxing and Splitting Hives* will help you safely box and split your own colonies of the Australian stingless bees!



Photographs: Russell Zabel.

Boxing and Splitting Hives:

A Complete Do-It-Yourself Guide for Stingless Bee Keepers

By Dr Anne Dollin

and Russell and Janine Zabel

Photographs by Les and Anne Dollin

An eBook in the *Native Bees of Australia Series* published by the Australian Native Bee Research Centre

AUSTRALIAN stingless native bees are a pleasure to keep in the backyard. They are fascinating to watch and are harmless to neighbours and children. Stingless bees suffer from very few pests or diseases and once a nest is transferred into a box, it is lightweight and easy to handle. As a bonus, they are great pollinators for the vegie patch and in warm areas can produce small quantities of a delicious tangy native honey.

Stingless bees are easy to manage. The major techniques are transferring the bees into a box and then propagating the hive by splitting it. Once these techniques are mastered, the new beekeeper can look forward to many years of enjoyment.

Russell and Janine Zabel of the Lockyer Valley, Queensland, are experts in the art of keeping Australian stingless bees. They have boxed over 2000 hives in the past 30 years and they also split hundreds of hives every year. In this Complete Do-It-Yourself Guide, Russell and Janine give a step by step demonstration of boxing and splitting hives, and explain everything you need to know about these two essential techniques.

Keeping Australian stingless bees is a great family hobby. Russell and Janine Zabel (on left) prepare to split a hive with the help of their children, Andrew and Emma.

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Chapter 1

Rescuing a Nest From the Bush

MANY beekeepers obtain their first nest of stingless bees in an emergency rescue situation. A nest may be found in a tree that has fallen down or in bush that is being cleared for a subdivision. Occasionally nests are even found in meter boxes underneath the footpath or in building cavities and they must be removed to allow construction or maintenance work. The first task of the beekeeper is to stabilise the nest and protect it from predators so that it can be safely moved to its new home.

If the nest is inside a hollow tree, the greatest initial threat to the nest is attack by ants or commercial honeybees. Stingless bees normally defend their nest by sealing virtually every opening in their tree cavity other than their entrance hole. The timber may split open when the tree falls or the timber cutter may accidentally cut through the nest with the chain saw, exposing the nest. If this damage is not repaired, the nest may rapidly be killed by ants or honeybees.

1 Temporarily fill gaps with any available material. Even newspaper or plastic bags, bound on with masking tape, can be useful to keep predators out of the nest. When taken to its new home, use No More Gaps or plaster of Paris (builder's cornice cement is a fast setting plaster) to more permanently seal any holes in the log. Do not use Liquid Nails as the solvent can kill the bees.

2 If the nest is heavy, it can be transported to its new location in pieces (each securely sealed up). Use metal strapping to rejoin the sections of the log once it is reassembled on site.

3 Cover the exposed ends of the nest by nailing on metal or timber caps.

Make every effort to get as many bees as possible back into the nest before moving it. High bee numbers are vital to the health of the nest. Move the nest at dusk or in cool weather when the bees have stopped flying. Close the entrance of the nest before transport by pushing a handkerchief into it or by taping some cloth over the entrance.

Ants can still be a problem for the nest in its new location. If ants appear to be troubling the nest, stand the log on top of a brick placed in a dish of water with some detergent in it. Commercially available ant dust sprinkled around the base of the log can also help.

Of course, a nest that is in a meter box or building cavity poses a much greater challenge as the nest must be completely removed from its original cavity. Such a nest is best transferred directly into a box but if necessary it can be placed temporarily into an esky or other box for transport. Russell and Janine have spare empty water meter boxes and when possible, simply lift out the water meter box including the nest and replace it with the empty water meter box. The water meter box with the nest is placed in a large garbage bag and taken home to rehome later. The basic technique is described in Chapter 2. However, pay particular attention to the following important points:

- Beware of allowing spilt honey to gather in the bottom of your box as many bees will drown in it.
- Try to encourage as many of the flying bees as possible to return to their nest in your new box or container before moving it. Place the box or container as close as possible to the original position of the nest and attract bees to the entrance hole in your box by placing nest resins around the entrance.

Chapter 2

Transferring a Nest into a Box

IN THE Lockyer Valley area, Queensland, Russell and Janine recommend that transfers be done between the beginning of October and the end of November. The bees need warm weather and a good supply of flowers nearby so that they can quickly repair their nests and rebuild their food supplies. Russell and Janine do not do transfers during January, while the cadagi tree (*Corymbia torelliana*) is producing seeds. The bees become so obsessed with collecting the seeds that they forget to guard their hive and do housekeeping. This is also a time when syrphid flies (see page 6) are common.

A fine sunny day with little wind is best. Russell and Janine recommend that the temperature should be at least 22ºC. They prefer to do nest transfers between 8 am and 2 pm.

Please note that nest transfers should be done in the shade. Direct sunlight on the brood should be avoided. If a transfer must be done in the sun, ask a friend to shade the brood as Janine is shown doing here with her hat. (The nests in this booklet were only photographed in the sun so that the technique could be more clearly illustrated.)

Preparing the Materials

1 The materials and tools needed for a nest transfer are as follows:

- Tarpaulin to work on
- Water in bucket for washing hands
- An old milk crate can be ideal to place the hive on
- Chainsaw (check that it is running well and sharp)
- Hammer, or battery-operated screwdriver (for removing end caps and straps from log)
- Large knife with a broad blade
- Crow bar or tyre lever for opening log
- Container for storing spare honey pots
- Sticky tape for sealing hive
- Empty hive box
- Strap to keep the hive sections together
- Stake to mount the new hive on

2 Russell normally mounts each hive box on a steel star picket fence post that is 165 cm long. A 14 cm length of 5.5 cm wide PVC pipe, that is screwed to one side of the hive box, fits over the top of the star picket. For a nest transfer, however, is often better to use a shorter wooden stake. At the end of the transfer, it is important that the entrance of the box be placed in exactly the same position as the entrance of the log (see arrow) originally was. So, choose a wooden stake that will elevate the box to this correct height.


1


2

Preparing the Hive Box

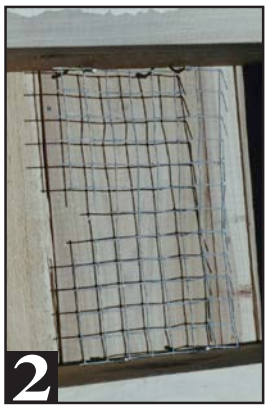
1 Russell's hive box is a modified OATH design (see our ebook, *Keeping Australian Stingless Bees in a Log or Box* — details page 19). It is 200 mm wide x 280 mm long. Each half box is 95 mm high. The timber thickness in the walls is 45 mm, but 22 mm timber is used for the roof and floor board. It consists of:

— a bottom half box with a floor board and entrance hole;

— a top half box (consisting only of four side boards – see photograph 1 on page 7); and

— a separate lid. The lid is made from two layers of wood with an air space between them to keep the hive cool.


1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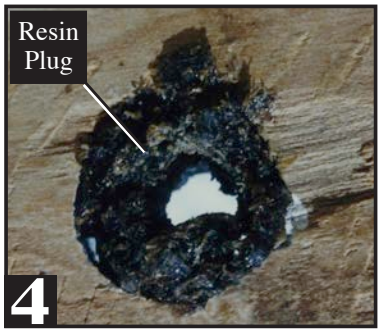
2 It is desirable, but not necessary, to nail a piece of wire mesh about 10 mm above the floor of the box so that the bees can clean up spilt honey underneath the nest.

3 It is essential to drill a 6 mm wide drain hole through the floor of the hive in both front corners of the bottom box.


3



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4 Russell's hives have a 16–20 mm wide entrance hole. Fill the inside of the entrance hole with a plug of nest resin material. (Perform this step after the nest is opened if material from another nest is not available.) Then push a 6 mm wide hole through the resin plug. This narrowed entrance hole will initially help prevent predators getting in. Later it will allow the bees to build exactly the size and shape of entrance that they prefer.

Preparing Yourself

When their nest is broken open, stingless bees can defend themselves quite aggressively. Although unable to sting, dozens of them may crawl over the beekeeper in a very irritating way, getting into the eyes, nose and ears and giving tiny nips. It is important to properly protect yourself against these attacks so that you remain comfortable and can do the transfer calmly and carefully.

1 One method of protection is to wear long trousers, a long sleeved shirt, a hat and a bee veil. Plait and cover long hair. Roll your socks over the bottom of your trousers and secure your shirt cuffs. The photograph shows beekeeper, Peter Davenport, dressed in this way.

2 Another method is to liberally spray yourself with a deterrent. Aerogard is effective and does not kill the bees. Tea tree oil mixed in water works well too and is harmless to the bees.


1

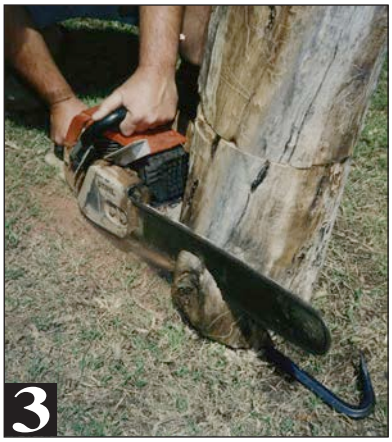

2

Opening the Log

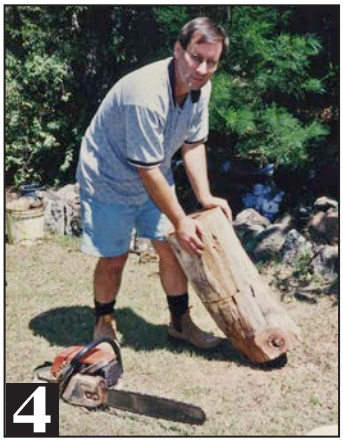
1 Remove the log's end caps, taking particular care to remove any nails which might get in the way of the chainsaw.

2 Remove any strapping that is joining sections of the log together.

3 If possible, carefully cut off the piece of the log that has the nest entrance and set it aside for attaching to the hive box later.



4 Place the tarpaulin (not shown here) on the ground. Then lower the log onto the tarpaulin, so that it can be cut open.



5 Plan the cuts to be made by the chainsaw. Two cuts should be made in each piece of log on opposite sides. In this photograph, the proposed cuts are shown by chalk marks on the log pieces. If possible, one cut should pass directly through the old nest entrance because many bees can be found hiding in the crevices near the entrance.

Cut the log open. Try to cut only through the timber to avoid damaging the nest inside.

6 Use a tyre lever or crowbar to gently lever open the log.

7 Assemble the cut pieces so that the structure of the nest can be seen clearly.

Russell has decided to transfer this nest into just one hive box. However, if the original nest is particularly strong with a very large brood comb and many stores, it may be possible to make two boxed hives from the one nest. See Chapter 3 on page 11 for more details.

Transferring the Food Stores

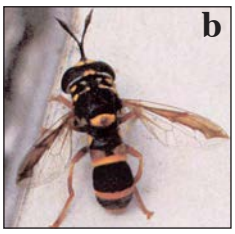
1 Remove any loose wood fragments or debris from the nest.

2 Gently lift intact sections of pollen or honey pots from the nest cavity using the large knife or a similar tool. If necessary drain the pots on the cut surface of the log.

3 DO NOT add leaking honeypots to the new nest box. Bees rapidly drown in spilt honey, and damaged honeypots attract predators such as phorid flies, syrphid flies and small hive beetles (see photographs below). Put damaged pots aside in a container.

After the nest transfer, harvest the honey by squeezing these pots through a cloth. You may like to feed this honey back to the bees later in a feeder or enjoy a taste of this unique bushfood yourself. Try drizzling the honey over ice cream for a tangy treat that will fascinate your friends!

4 When transferring the food stores, use the bottom half of the hive box by itself because you do not need a full-height box at this stage. Carefully place intact sections of the food pots into the corners of this bottom box.



Predators:

a: The tiny black phorid fly (2.5 mm).

b: The black and yellow syrphid fly (15 mm). Photograph: Russell Zabel.

c: The South African Small Hive Beetle (5–7 mm). Photograph: James D Ellis, Wikimedia Commons.

For more details about these predators, see our ebook, Keeping Australian Stingless Bees in a Log or Box — details page 19.

Note: the box shown here has walls constructed from 22 mm timber. Russell now uses 45 mm timber for his hive walls. See the Preface of this booklet on page i.

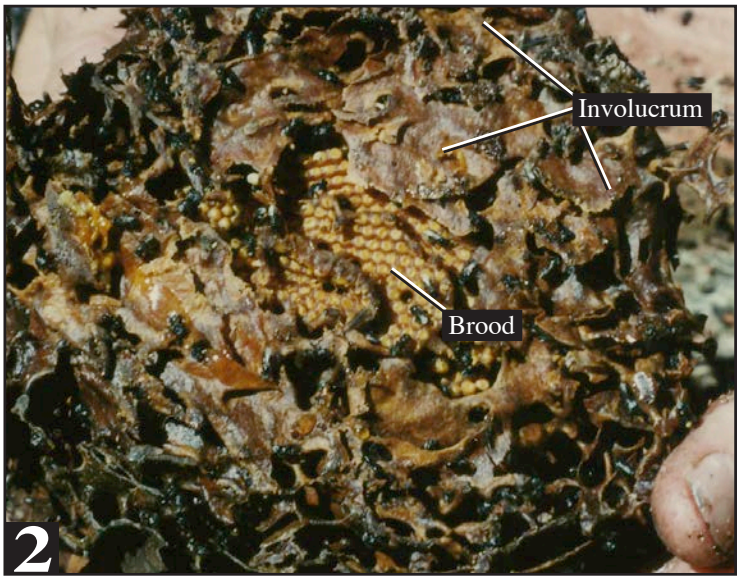
Transferring the Brood

1 The brood comb in some nests can be quite long, so place the top half[1] of the hive box on top of the bottom half now. The full-height hive walls can provide support for the brood comb.

Check the brood comb carefully before disturbing it to make sure you know which is the top of the brood. Gently lift out the brood with the large knife. Remove any debris or pieces of timber adhering to the brood as these may make it difficult to split the brood in the future. Place the brood in the hive box beside the food stores, making sure the top of the brood is still facing upwards.

2 In *Tetragonula carbonaria* and *Tetragonula hockingsi* the brood is usually enclosed in a multilayer involucrum sheath which helps to insulate the brood. This can be clearly seen in this photograph of another one of Russell's nests. It is best not to disturb this sheath if possible.

Sometimes a beekeeper may need to box a nest that has a badly damaged brood comb. In this case it is helpful if the beekeeper can recognise the different parts of the brood so that they can be placed in the box in the correct orientation.



3 In *Tetragonula carbonaria* (shown here) and in *Tetragonula hockingsi* the brood consists of many horizontal layers of 3 mm long brood cells. In one section of the brood, there are newly-built cerumen brood cells. These cells are open at the top. This section of the brood is called the advancing front.

(Continued on Page 8)

(1) Note: the top half of Russell's hive box (see photograph 1) consists only of four side boards. Russell now uses 45 mm timber for the walls of his hive boxes – see Preface on page i.

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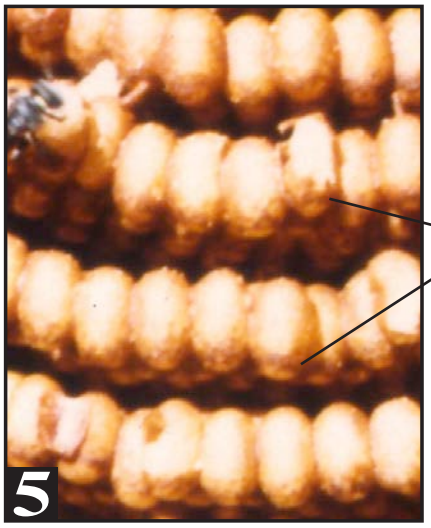
Transferring the Brood (Continued)

4 Just below the advancing front are layers of resinous cells that look relatively dark. This is where the young larvae (or grubs) eat their tiny cake of pollen and nectar and grow larger.

5 When the larvae are fully grown they spin oval shaped, silken cocoons around themselves before they develop into adults. Other worker bees in the nest strip the cerumen off these layers of cells. So these layers look paler than the other layers of cells. The bottom of each cocoon often has a dark layer which can help the beekeeper arrange these layers in the right orientation.

The cocoons may be below or above the advancing front depending on the stage of the brood cycle (see diagram and description in our ebook, *Keeping Australian Stingless Bees in a Log or Box* — details page 19). So it does not matter greatly what order the layers are added. However, it would help the bees if all the layers were placed into the box approximately horizontally and the right way up.

6 In *Austroplebeia australis* and similar species the brood cells are constructed in a loosely placed cluster, rather than in layers. New cells may open in nearly any direction. Cocoons may be seen in groups within the cluster. With these species it is less important to know which is the top of the brood. Nevertheless, if possible, transfer the brood comb intact and in its original orientation into the hive box.



Transferring the Bees

1 It is important to remove as many bees as possible from the original nest cavity and transfer them into the new box. Physically shake bees from the log pieces into the box. Break any remaining pieces of structure out of the log cavity and brush the bees out of any crevices. Sometimes even the queen may be found hiding in a crevice in the log cavity. Stand the log pieces up to drain out any spilt honey which may cause bees to drown.

2 Dr Tim Heard of Sugarbag Bees, Brisbane, suggested that bees still in the log can be persuaded to leave by placing cloths soaked in a little tea tree oil inside the log cavity.

3 Alternatively lay the empty log pieces in the direct sunlight.

4 Place the lid on the box. Bind the hive box securely together with a strap or rubber band. Russell now uses custom-made hive locks to secure all parts together. See details in the Preface to this booklet on page i.

5 If it was possible to cut off the entrance structure from the original log at the beginning of the transfer (see page 5), attach this structure around the box entrance hole using Blu Tack or sticky tape. This will make the hole look and smell like the original log entrance.

6 However, often the original nest entrance gets destroyed when the log is cut open. In this case, stick soft pieces of resinous material from the nest around the box entrance.

(Continued on Page 10)

Transferring the Bees (Continued)

7 Elevate the box on the stake or a similar support so that its entrance is as close as possible to where the entrance of the original log was. As the box entrance is now in the original position, and it looks and smells similar to the log entrance, the bees should soon start streaming into the box.

Final Steps

1 Tilt the hive box so that any spilt honey inside the hive can drain out though the drain holes in the floor of the box.

2 Sweep up any remaining nest debris so that the bees will not cluster on this material instead of entering the hive. All evidence of their old log home should be moved far away from the transfer area. This prevents the bees from being attracted to remnants of their old home.

3 When the bees have settled down, tape up all the joints in the hive box to keep predators out of the hive while the bees are resealing it. The resins or entrance structures that were placed around the box entrance can be removed once the bees have accepted their new box.

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Chapter 3

Transferring a Large Nest into Two Boxes

A PARTICULARLY strong nest with a very large brood comb and many stores may sometimes be transferred successfully into two boxed hives. If all goes well, one of the new boxes will end up with the mature queen bee from the original nest. The other will need a new queen bee, raised from virgin queens already in the nest or larvae developing in the brood. So this should only be attempted in a good season and in areas of ideal climate for stingless bees such as in northern NSW and in Queensland.

The materials and initial preparation steps are the same as for a normal transfer.

Transferring the Food Stores

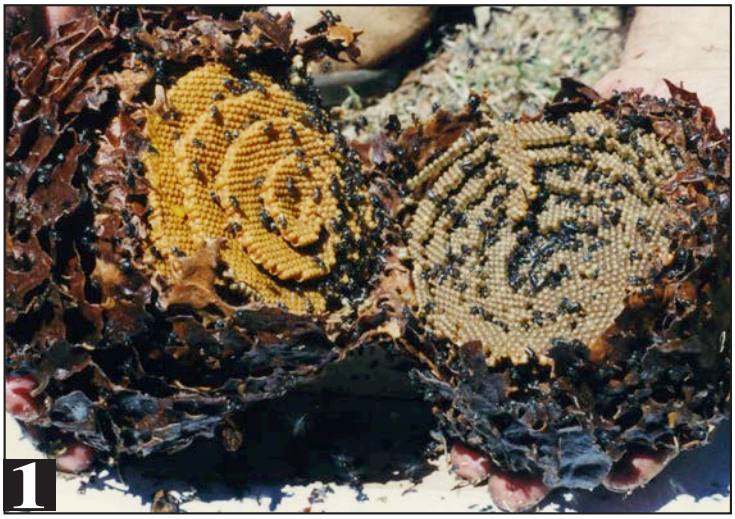
Divide the intact food stores into two equal parts and place them in the bottom halves of the two hive boxes. Take care not to transfer pots that are leaking honey, as previously stated.

Note: the box shown here has walls constructed from 22 mm timber. Russell now uses 45 mm timber for his hive walls. See the Preface of this booklet on page i.

Transferring the Brood

1 Gently remove the brood comb with the large knife or similar tool. Cut or break the brood into two equal sections. In this photograph of a *Tetragonula carbonaria* brood, the spiral shaped advancing front with the newest cells can be seen on the left side. On the right side can be seen layers of cocoons.

(Continued on Page 12)



Transferring the Brood (Continued)

2 Add a top half box to each of the hive boxes so that they are now full height. Place one half of the brood in each hive box.

Check carefully that both halves of the brood are oriented the same way as they originally were in the log.

Transferring the Bees

Shake or brush as many bees into the two boxes as possible, as described previously. Put the lids on the boxes. Use Blu Tack or sticky tape to attach the old log entrance structure around the entrance hole of one box (as shown) and attach nest resins near the entrance hole of the other box.

Final Steps

1 Place the two boxes, one on top of the other or side by side, in the position of the original log. This will allow returning bees to enter both boxes. Ideally you want about half of the bees to go into each box. If one box ends up with a majority of the bees it may be helpful to reverse the position of the boxes for a few days. Clean the area and seal the box joints with tape as described previously.

2 An alternative method for boxing a particularly large nest is to transfer it into an enlarged box made from three sections of hive box. This, however, will create problems when you wish to split the hive as the box cannot be divided equally.

Chapter 4

Splitting a Hive

AUSTRALIAN stingless bees produce new nests in a way that is completely different from that of commercial honeybees. In honeybees the old mature queen bee leaves the mother nest with thousands of worker bees in a huge swarm. Scout bees quickly find a suitable hollow, then the whole swarm moves in and begins to construct the new nest. In stingless native bees, workers from the mother nest spend weeks building a new nest inside a nearby hollow. When it is nearly finished, a young queen bee from the mother nest flies to the new nest.

In honeybees, beekeepers can easily start a new hive by boxing a swarm. This does not work with *Tetragonula* stingless bees because they have such a different method of building new nests. Instead, beekeepers have found that a good way of propagating *Tetragonula* stingless bees is by physically dividing or splitting the whole hive. For this purpose most beekeepers keep *Tetragonula* stingless bees in hive boxes that have been cut horizontally into two halves. Our ebook, *Keeping Australian Stingless Bees in a Log or Box* (see page 19), reviews the major box designs used in Australia.

The Basic Method

1 Take a hive that is completely full of brood and provisions (the 'Original' box shown on the left) and an empty hive box (the 'New' box shown on the right).

2 Separate the top half and the bottom half of the Original hive box.

3 Place the Original Top Box onto the empty New Bottom Box. Finally place the empty New Top Box onto the Original Bottom Box.

On the following pages we shall look at the splitting method in full detail.

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Choosing the Best Time to Split a Hive

In the Lockyer Valley area of Queensland, Russell and Janine begin to split their hives in early September as long as the night time temperatures are not dropping below about 10°C. They generally do not split hives after late November. Local climatic conditions must be assessed. The time of year is important for four reasons:

(a) Splitting damages the protective involucrum sheath that normally surrounds the brood. If night time temperatures are low, the brood could become chilled before the bees can repair their involucrum.

(b) The newly split hives lose half their provisions during a split. They need to have a reasonable period with warm weather and good flowers so that they can replace these provisions before winter begins.

(c) Only one of the newly split hives receives the mature queen bee from the original hive. The other newly split hive must produce a new queen bee for itself. Between September and February there are usually enough queen cells (shown on right) or virgin queen bees in the hive to allow the queenless split hive to produce a new queen bee.

Two queen cells in a Tetragonula brood. Photograph: Dr Tim Heard

(d) Russell and Janine avoid January when the cadagi trees produce their seeds. During this chaotic season, the bees become obsessed with collecting these seeds, and they forget to guard the hive and do housekeeping duties.

Russell and Janine normally split their hives on fine days with temperatures above 18°C and little or no wind. The split should be done between 8 am and 4 pm.

Checking that the Hive is Ready to Split

Boxed hives of *Tetragonula carbonaria* can be split every 1–2 years depending on the strength of the colony. For a successful split, the hive needs to have plenty of provisions and a brood comb that occupies the full height of the hive box. Opening a box to check the condition of a hive can damage the protective involucrum sheath and spill honey inside the hive. If done frequently this can even kill a hive.

Some beekeepers insert a sheet of perspex under the lid of their hive boxes so that they can monitor the development of the hive without breaking the hive's seal. This can work well. However, *Tetragonula* bees will gradually smear resins over these windows to keep light out of their hive.

Another good way to monitor the development of your hive is by weighing it. Weigh the hive, then subtract the weight of the empty hive box. Tim Heard recommends that to be ready for splitting, the hive itself (without the weight of box) should be at least 3 kg. Ideally it should weigh 4 kg or more.

Preparing a Site for the New Hive

Russell recommends that each stingless bee hive should be mounted on a steel star picket fence post (see page 3). The hive should be in the shade after 10 am in summer and the hive entrance should face between north and east.

For the newly split hives there are two options:

(a) The preferred method is to move one split hive away to a new site. Russell recommends that the split hive with the Original Bottom Box be moved away because its contents are more stable and unlikely to collapse during transport. Furthermore this split hive has the original hive entrance hole, smeared with resins carrying the hive's scent. This would assist the bees in this split hive to orient to their new location. This split hive should be moved at least **two kilometres** away so that the foragers are unlikely to find their old landmarks and fly 'home' to the original nest site.

(b) Keep the two newly split hives together, one on top of the other. This option is not recommended.

If you choose to move one of the newly split hives, hammer a star picket in at the new site (as shown on right) ready for the new hive.

Preparing the Materials

— Large knife with a broad blade
— Large screwdriver or hive tool
— Water in bucket for washing hands
— Bucket of sump oil to protect new hives from ants
— Aerogard or similar to deter bees from attacking you
— Empty hive box
— Hive lock to keep the hive sections together
— Masking tape
— Sticky tape
— Hand-held scale for checking hive weight (optional)

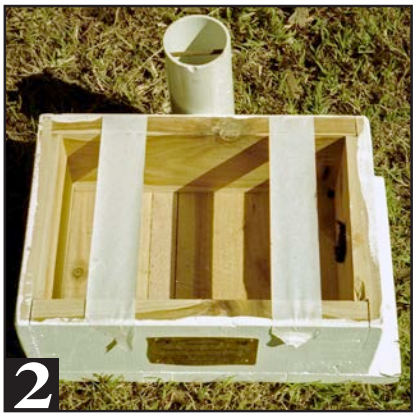
Preparing the New Hive Box

The new hive box must be the same size as the original box. You can make one yourself from durable, untreated timber such as cypress pine. Alternatively you can buy a new box from Russell and Janine Zabel (see details on page 18).

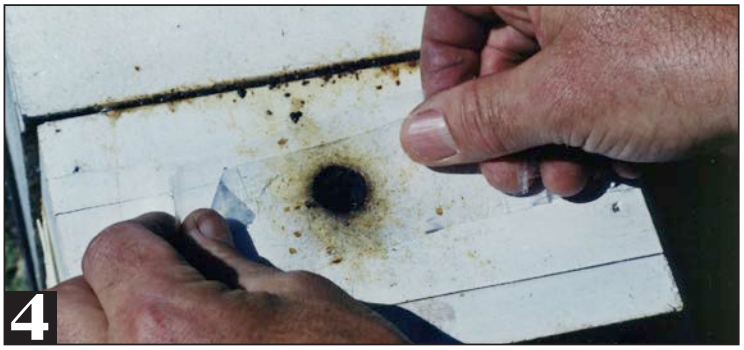
1 Use a broad roll of sticky tape to seal the lid onto the top of the New Top Box.

2 Place two strips of 38 mm wide masking tape across the empty New Bottom Box. The nest structure in the Original Top Box sometimes collapses after a split. This is particularly likely if the bees have been collecting the resins from the cadagi tree which have a low melting point.

3 Russell finds that the strips of masking tape are sufficient to prevent hive collapse and that the bees incorporate the tape strips easily into their nest structures, as shown.



4 Cover the entrance of the Original Bottom Box with another piece of sticky tape to keep as many bees as possible inside the hive. Also tape over any drain holes underneath the Original Bottom Box.



Note: the box shown here has walls constructed from 22 mm timber. Russell now uses 45 mm timber for his hive walls. See the Preface of this booklet on page i.

Splitting the Hive

Splitting can be a rather traumatic operation for the bees; so try to do it as quickly and efficiently as possible.

1 Use the broad bladed knife or the large screwdriver and begin to prise open the Original hive box. If the nest contents do not break readily into two fairly even halves, use the knife to cut through the brood comb.

2 Check that there are plenty of provisions and brood comb in both halves of the Original hive.

3 Take the Original Top Box and place it onto the empty New Bottom Box.

4 Join the empty New Top Box to the Original Bottom Box.

5 Secure both hive boxes with straps or rubber bands. Russell now uses a metal hive lock – see details in the Preface of this booklet on page i.

6 Use sticky tape to seal the middle joint in each box to keep out predators.

Setting Up the Newly Split Hives

1 Brush sump oil onto the top of the star picket at the original hive site to keep ants away from the newly split hive while it is repairing its seals.

2 Place the split hive that has the Original Top Box and the New Bottom Box onto the star picket at the original hive site.

3 Russell and Janine now recommend that the split hive that has the Original Bottom Box and the New Top Box should be transported by car to a new site at least 2 km away. Keep the hive cool during transport.

4 Brush sump oil onto the star picket at the new site. Then place the newly split hive on this star picket. Remove the tape from the hive entrance and from the drain holes once the hive has been set up.

5 As discussed on page 14, the split hive that has the Original Bottom Box and the New Top Box may be placed on top of the other split hive. However, this is not the recommended method. (Note that the split hive should not be placed anywhere else in the yard as the forager bees will return to the original hive site and become lost.) Remove the tape from the entrance hole and from the drain holes of this hive.

Care of the Hives After Splitting

Russell normally leaves the split hive at the new site for about four weeks before bringing it back to his original site. It is best to move a hive in the evening after the bees have stopped flying and tape up the entrance during transport. Russell then normally re-establishes the hive on the original site at least five metres away from the other split hive. This photograph shows the extensive repair work done by a hive in the first few weeks following a split.

Chapter 5

Troubleshooting Guide

Common Problems When Boxing Nests

The bees are attacking the beekeeper

Tetragonula bees cannot sting and are normally gentle. However, many new beekeepers underestimate the ability of these bees to annoy you if you break open their nest. Many bees may crawl over your face, legs and arms, giving dozens of nips that are like tiny pinpricks. This can be most irritating and can make it difficult for you to calmly perform the work required. Be sure to protect yourself adequately as described on page 4.

The cavity is not clean and straight

Sometimes a nest may be in a twisty irregular cavity. If the cavity has also been used by termites it may contain large amounts of dirt too. Boxing a nest such as this can take a great deal of time. Patiently pick out the nest pieces and remove as much dirt and debris as you can. Be sure to protect yourself against any attack by the bees so that you can comfortably work on the nest.

The honeypots have been badly damaged

Do not put leaking honeypots into your hive box. Spilt honey attracts predators and can drown bees. Damaged honeypots may be saved and the honey later fed to the bees in a feeder.

Predators are attacking the hive

The smell of spilt honey is highly attractive to some predatory flies. Common types include the yellow and black striped syrphid flies which resemble wasps, and the tiny black hunchbacked phorid flies (see page 6). If these flies succeed in laying eggs inside the hive, their grubs will riddle the food stores. If the bees are not strong enough to get rid of these grubs, the damage can lead to the death of a hive.

Try to get the maximum number of bees into your hive box. Use accurately constructed hive boxes which have no gaps between the hive sections. Once the nest is installed, ensure that the hive box is well sealed by taping up all joints. Use resin to reduce the size of the entrance hole. Remember to tilt your newly boxed hive so that any spilt honey can drain out through the drain holes in the floor of the box.

Common Problems When Splitting Hives

The brood is not big enough

Ideally the brood comb should extend from the top of the hive box to the bottom. If the brood is too small, it may be advisable to reseal the hive and try again later when the bees have had time to build a larger brood.

If the brood does not break or cut evenly into two halves when the box is opened, it may be possible to transfer some layers of brood from one half to the other.

The queen bee and/or the queen cells are not visible

Within the intricate structures of *Tetragonula* nests, it is rare to see the queen bee. Queen cells may also be difficult or impossible to see as they may be positioned between the edge of the brood comb and the involucrum, deep within the hive.

It causes too much damage to search for the queen or queen cells in a hive. It is better to choose a good season when the presence of several queen cells is very likely and assume that they are present. Do not disturb the comb or the involucrum. Instead, perform the split quickly with as little damage to the structures as is possible.

Predators are attacking the hive

See discussion in the section on boxing problems, above.

The newly split hives do not have much honey

It is better not to add extra stores from other hives. After a split the bees must first work very hard to repair their damaged brood. Adding loose honeypots only increases their workload. Instead, perform the split in a good season so that the bees can rapidly collect more stores when they need them. You may also later provide the bees with supplementary honey using a feeder.

Contact Details for More Information

Anne and Les Dollin of the Australian Native Bee Research Centre produce information about stingless bees and other varieties of Australian native bees. ANBRC publications include the *Native Bees of Australia e*book series, and a Sydney native bee field guide (visit the Aussie Bee website).

Contact details: ANBRC, PO Box 74, North Richmond NSW 2754.
Aussie Bee Website: www.aussiebee.com.au

Russell and Janine Zabel specialise in Australian stingless bees and provide a wide variety of services including:

- Sale of *Tetragonula carbonaria* nests in boxes and logs
- Sale of *Austroplebeia australis* nests in boxes and logs
- Log boxing service (SE Queensland only)
- Native bee rescue service (SE Queensland only)
- Sale of professionally-made empty hive boxes
- Free professional advice

Contact details: 3597 Warrego Hwy, Hatton Vale Qld 4341. Mobile: 0404 892 139. Email: bees@zabel.com.au
Website: zabel.com.au

Further Reading

Other eBooks in the *Native Bees of Australia Series*:
— *Introduction to Australian Native Bees*
— *Nests of Australian Stingless Bees*
— *Behaviour of Australian Stingless Bees*
— *How to Recognise the Different Types of Australian Stingless Bees*
— *Keeping Australian Stingless Bees in a Log or Box*

Native Bees of the Sydney Region: a Field Guide (PDF ebook)

The above ebooks are available from the Aussie Bee website:
www.aussiebee.com.au/abshop.html

The Australian Native Bee Book by Tim Heard (2016).
Available from: **nativebeebook.com.au**

Australian Native Bee Research Centre, PO Box 74, North Richmond NSW 2754