Valley Bees Meeting Theme : Native Bee Hive Loss due to Extreme Heat Kandanga Hall, January 12, 2014

Athol called the meeting to order at 1:30pm with welcome to all newcomers.

Today's meeting will have special information concerning the recent heat wave and how it is affecting the native stingless bees.

Apologies from Chris Fuller, Tim Heard and John Klumpp, along with Tom Codde, Bill Turner, Wendy Strathearn, Marilyn Luck, Sue Molloy, Sandra & Ben Cootes, Donald Humbler & Claire Nicholls.

Athol : Thank everyone for attending today. Last meeting was our Christmas meeting and no minutes were taken. Treasurer's report from Lynn is that our bank accounts continue to grow.

Athol : Everyone should have a ticket for the lucky raffles for today which were donated by Danny Summers and John & Veronica Carley.

Welcome people who are attending for first time. Also welcome to new Valley Bees Members : Fern McGee, Ben Kaluza, Lorraine Currie, Greg and Jo Erdwards, John Salway, Peter Velenski, George and Shirley Pacey, Andy and Gail Cobb, Jeff and Ann Ross, Joan McVilly, John Kingsland, Robyn Bowman and Steve from Missibotti.

Our main speakers for today will be Rob Raabe, Georgio Venturieri (from Brazil) and Bob Luttrell.

.....

First we will discuss the honeybee situation : All of Athol's honeybees have survived the heat. Honeybees seem to cope with the extreme heat with their natural activities to cool themselves and the hive.

Kayle : Has had no problems with honeybees from heat this year. Has had problems with meltdowns before...normally West of the Range.

Reports from Maryborough are that they are having the worst season this year. Eucalyptus seem to have switched off their nectar flow and are not performing as usual. The last three years have seen a downturn and beekeepers don't know what the exact problem is. Older beekeepers say it is the worst in 40 years and are having nowhere to place the hives for honey production.

Athol : The message is : if you have only a few hives...leave the honey in them for now...the bees will need the honey to eat during the heat and the rainy season.

On Saturday 25th of January we will be placing a honeybee hive and stands at the Gympie Landcare Nursery where we can then hold future workshops for Valley Bees. We will also be holding a working bee on that same Saturady, for the Native BeeWall and BeeGarden at the Nursery.

Glenbo : Gympie Landcare itself are holding a series of workshops, "Birds, Bees, Butterflies & Beneficial Insects for the Garden" over the coming months. There are other fantastic programs coming up at Landcare as well, including gardens for retirement.

Athol : Recommending members join Gympie Landcare.

Any other topics concerning Honeybees from members?

Sara : Reported on article in U.S. newsletter from wholesale giant "COSTCO" in regards to the current state of colony collapse in the U.S. and how it is affecting food and honey production. It is reported that in 2012 the largest die-off of bees in history was experienced in the U.S. "COSTCO" is donating a percentage of all honey sales to research in this area. Beekeepers believe that the neonicotinoid insecticides are a huge concern to bee health.

Athol : It is now recognized that fungicides are also affecting the honey bee and are not safe to use either. Quoting research done in Florida on chemicals used in fungicides.

.....

Athol : Bring the meeting to the main topic of the day : Native Stingless Bees and the recent Hive Loss resulting from the Heat Wave.

Handed the meeting over to Rob Raabe :

Rob Raabe...

I've been rescuing native bees for about 20 years, I did a lot of work around Ipswich, I'm an old Ipswich boy, it gets pretty hot down there.

About 15 years ago, we were rescuing bees from a very hot spell in Ipswich, we had a week of over 40 degrees.

We lost hives, so we had a conference back then under a tree in the paddock, about 6 of us, who were about the only ones around the place that were doing much.

We reckon we came up with ideas that helped. A lot of people don't use these (referring to a polystyrene box) - I use them, and until somebody invents a box that works where you don't need them, I'm going to keep using them.

Polystyrene boxes just put together with no-nails, then I seal it with the white silastic (the water-based one). Better if they're painted white - but I live right beside (------) Hospital, and I have 47 hives in my yard - it creates a bit of attention. You can see them even through the fence. So I paint them green, just so they are less conspicuous. But they will work better if they are painted white.

There's a few extra things it should have done to it. When the bees bring the warmth / heat out of the hive, it goes in under the top, so it should have vents in the top. I'm hoping to get more knowledge on how and where to put the vents from people who can share their knowledge and tell us what to do.

I am currently boring holes in them, but I think they need a vent on the top with an elbow, for the heat to come out. On the inside, the styrene box sits down on top of the wood, I think it needs a little plate / spacer, to keep it up a bit higher off the timber of your box.

Without this ventilation, the warm air still sits inside, it's not escaping fully outside the hive. You can bore i(the ventilation) through the sides, but I feel the top might be better.

I was pretty lucky. I think that talk we had (in the paddock all those years ago helped me a bit) - I didn't lose any hives. With my 47 hives at home, they were all - bar one - in the shade.

The one that wasn't in the shade, two-thirds of the bees died, so I put it into a smaller box, there's a young queen in there, and I think they're going okay. What I'll do is in a week or so, I'll move it in front of where a very strong hive is - I've got a couple of very strong hives - and just let them do a swing around. They can build up their numbers. You'll notice they won't want to go in for a while, they get stubborn, but after a while they get sick of sitting out there, so they'll go inside.

Ventilation on the boxes themselves, I think we could improve a lot, other than what we're already doing, so I'm hoping new information comes in about that.

I also water my hives, (all bar that one were in the shade), but I still watered them all, three times a day (during the extreme heat). I didn't feel like going out in it, but I did. I watered at 11, at 1pm and at 3pm, and I think that helped a lot too. Other than that, they're all going well. But we do need to work on the boxes with the ventilation.

If people buy hives off me know, I tell them to put them in the shade, beside a water tap where they can water them, and I tell them to keep an eye on them.

A chap in Ipswich, when we had that trouble, was a very knowledgeable person, he came and told me that it wash't working (watering the hives). But the only problem was, he had 15 meters of hose, lying around in the hot sun, so not only were they dying inside the box from suffocation, but he was scalding the poor little buggers as well. So be careful of that, and just watch your water.

I know some people did have their hives under polystyrene, they did have them in shade, and they still lost them. So there must have been some really extreme pockets of temperature..

In regards to the ambient air outside the hive, some people observed the bees flying out of the hive, and just dying. I am not sure what can be done about that. You lose a few hundred which fly outside and die in bad conditions, but you've just got to keep the temperature inside the hive cool.

If you water, don't just water outside the hive, but put the water on the hive itself. Some people don't like doing this, but it's no different than when a thunderstorm hits. I also water the ground around the hives, and under the cover a little.

If you open up your hives, if you lift the lid and expose the hive to the very hot air, it might do some damage. So probably avoid this. I tend to let native bees do their own thing.

A friend of mine, (Col Webb) - he had 2 identical boxes with 2 identical thermometers, he mad a cover for one, and he didn't have a cover for the other, he put them out in 36 degree heat, and he had 9 degrees lower temperature inside the covered box. He didn't have vents in the box or the lid, so it's going to take a hell of a long time before somebody convinces me not to put covers on my hives.

Athol : Thank you Rob. He will be available to answer questions after meeting.

Also a suggestion from Chris Fuller is to place a gauze covering at entrance of hive and take hive into cool /aircon when available. This covering can also be used when concerned about pests to a hive by placing covering over entrance and opening it from 10:00am to 3:00pm.

Glenbo : Has a handout composed by people unable to attend the meeting today - Chris Fuller, Tim Heard, John Klumpp, Russell Zabel and Casey Pfluger regarding their experience of extreme heat and causes of hive die-off and suggestions on what to do to prevent. Good information and everyone will receive a print-out today.

Athol : Recognition to Glenbo for the huge effort he has put into putting this meeting and the experts together on this topic. Also for the article in Gympie Times (front page headline), Sunshine Coast Daily, Bundaberg and Toowoomba papers. Thank you Glenbo.

It was noted that this is one of the very few times that native bees have secured a front page headline!

Athol : Turn the meeting over to 2nd speaker: Giorgio Venturieri from Brazil who is here doing research on the effects of

temperature on Native Bees...among other research.

Giorgio Venturieri . . .

He is very grateful for the turnout and the show of interest in the Native Bee. He will share research with us on his website.

There are 70 species of Native Bees in his area of Brazil and in the Amazon there are 200 species and in Australia there are a lot fewer. His work has been on domesticating the local stingless bee for honey production and crop pollination. He has learned that in many cases the wrong species has been used for pollination.

In research on temperature, light and humidity, he has developed the methodology of using the "micro colony" to study bee activity in many different locations.

Giorgio has provided us with the following information, compiled with Tim Heard ...

Recommendations that could help to minimize hive loses arising from the heatwave.

Direct sun on the hive boxes is very good in winter to warm the hive and improve bee activity and brood growth, but it can be dangerous in summer. We recommend at least one silver or white roof that overhangs the walls by 10cm, such that some shade is provided to the walls that would otherwise be in direct sun. A good roof is compulsory in summer.

I (GV) did some tests putting bees inside incubators in the lab and the bees died after 10 minutes when the temperature was over 42°C. GV also measured the temperature of walls of the boxes' when in full sun and sometimes they were over 50°C, usually 10°C more than a shade under the roof.

Make your hives from thick material. Never use walls of less than 25mm. Wood is preferable to dense plastic. The denser the wood the poorer it is as an insulator. So pine is a better insulator than hardwood.

A second hole on the top of the hive will help the bees to ventilate inside. If you do it when the hive is strong, the bees will reduce the hole with microporous resin and sometimes, if needed, use the hole as a second entrance. In winter they will close if is needed.

In extreme heat conditions, to try and save the colony, bring them to a cooler place (tree shades or even to a room with AC). Do not worry about any workers that may be left behind, this is an emergency after all; the foraging bees are only about 10% of the colony and they will be replaced in 15 days if the colony survives. If you get the information in advance, move the hive the night before and save the foraging workers too.

If you lose a hive, try to use the remaining structure to help start a new colony. Remove the dead brood and replace it with a piece of brood from a strong hive. But take care. Be sure that you do not have the larvae of syrphid flies and phorid flies, small hive beetles, ants etc. You can put the hive inside a freezer (before you replace the brood) to kill any potential pests if needed. Alow the hive to come to ambient temperature before adding brood.

It is part of the business, it is nature and "meliponiculture" is new for all of us, what happened on 3rd January 2014 was an extreme situation.

For professionals (large stingless beekeepers), I recommend insurance or at least plan for these events and save some profits for these occasions.

There is more informayion available from Giorgio, including charts and photographs.

Giorgio can be contacted on : gventurieri@gmail.com More information is available on : https://www.facebook.com/abelhasdomesticas

Athol : Thank you Giorgio. Turn over to Bob Luttrell . . .

Bob Luttrell . . .

This current situation takes me back nearly 10 years, back to where I started seriously with stingless bees. Then it was what I called Designing a Bee Box by a Committee - reading everything, moving everything, and I drew a lot of graphs then, and they're here with me today. I tried to look at the nature of the bees themselves.

Just to report what happened to me. I have something like 200 hives in my yard - one acre just out of Samford Brisbane. I lost only 2 hives - they were thick walled hives, but single skinned lid, 4cm of timber on top, in full sun, which was predictable. These boxes (shows photo) were also in full sun, but all survived. It got to 44C here.

This here is a Bill Milne box (shows sample). Bill knew what he was doing, and what he was designing for. It is sad that I have missed the opportunity to speak to him. He deserves a place on the meliponary board of honour. His box design that I have was in total full sun, they are double walled boxes, it was out working normally the next day.

The common feature of all my boxes are thick walls and a very thick tropical cover, painted white is best.

When I started, I decided that a good point to start was to understand what actually happens inside a natural nest, in a tree. I was naive enough to think that maybe I could make a box that matched it. That was naivety in the extreme!

I had a Hockingsi colony from Tiaro - not far from here. One firewood cutter got it for me. It was a good 16" hardwood log. I plotted an information chart over a 17 day period, shown here on this chart. It looks very dramatic. Three spots it was tested - in the brood nest, in the empty hollow, and in the ambient. I actually asked Helen Wallace at the USC how I make sense of that, and it comes down to a chart which is broken down into one day intervals, and averaged out. The the temperature peaks in the middle of the day, the red line (which indicates temperature inside the hollow) does exactly the opposite. This is the environment in which the bees are living - in the middle of the day, inside that hollow, is the coolest time of the day. Then in the brood, they simply warm it 5 degrees, largely by the involutrum and the mass of bees.

Please note : if you wish to find out more about Bob's charts, or see photographs of his work, contact him direct on robertb.luttrell@bigpond.com. These charts are available on his www site.

I was still game enough to think I could make a box to duplicate this, but that has eluded me, I've made one that's half way, but I can't carry it! So I may as well have the log. It involves 2" of timber and 2 layers of terracotta tiles, with 2 layers of insulation. It is very difficult to get that performance in a built structure.

I also the measured and charted boxes. I take all my measurements in full sun. I know everyone says you put the hive in the shade, and you do, but I was thinking : native bees and pollination, and moving hives - you're not always going to be able to place them in the perfect shaded spot. The hive, at least, be able to stand up in the sun.

Basically, your boxed hives are jammed up against ambient heat, and in my charts, they follow ambient very closely, until you put the tropical (thicker) lid on top, thicken the walls, use white paint, put the polystyrene cover over the top, and you start getting better results. I got better results painting the boxes white, which I use in summer, and a light grey, which I use in winter In winter, you want the hives a bit warmer. Since the polystyrene are the common broccoli boxes, surplus to requirements. My wife is very good at getting these, she can fit 17 in her Mazda 3, more than I ever can!

I have at times been a little disillusioned at not being able to duplicate the log efficiency. I can get more efficient boxes than some of the smaller, 8" Austroplebia logs, but most of the boxes in their efficiency lie somewhere between log and ambient.

As a result, set pout to follow the concepts of an upright box, to use the heat stack, and to do this, you need to have an opening at the top of the box. In Brazil, they have an opening in the bottom board, and an opening in the cover.

So, if you use a polystyrene cover over the top, painted white, and thick timber, you slow the rate at which the heat moves through the hive to the bees. It's a time thing. You have to slow the rate of the heat progression through the thermal mass and into the box, and not have a heat trap in the top (have ventilation holes). Basically, the heat hits the outside surface, moves through the material at a certain rate, then is transferred to the bee level. Anything you do to slow this process down during extreme heat is good.

By the time the outside temperature heats up to 40C, the bees themselves don't take that air in, if it's hotter than they need. My bees, I saw them ventilating to bring the air in at 5 o'clock in the afternoon, when the temperature had gone down. When the temperature outside was cooler than inside, they were ventilating. They form that little chain. This is on Sunday afternoon after the hassles.

One hive I lost, that was in full sun, it died because it was a weaker colony. A very similar hive, that was of greater strength, survived. If you haven't got enough bees, it might not survive. You need a strong enough colony in the box to ventilate it.

Some boxes out there now simply don't have enough material on top.

My hives have multiple openings / entrances. A second opening is needed at the top, I don't think it matters whether it's at the

front of the back. If you put it in the back, the bees will sometimes switch and use the back entrance (facing south). 80% of my hives do this, My logic is, they do this because they don't have to get up as early!!! But that's my logic...I'm sure the bees have other reasons! Hockingsi will almost always use at least 2 entrances, you can never pick which one, the individual colony will decide it.

I have a huge range of colonies, every one has multiple entrances.

The hives can be brought inside to a cooler space successfully, you just need to record very carefully exactly where they came from. It's no problem locking them up for a period. I once took 6 of my colonies to a Garden Expo in Townsville, not only were they locked up for the travelling time, but I couldn't let them out up there, so they had 5 days locked up. And they were fine.

With moving them to shade during extreme weather, it's not just a case of moving them to the shade of a tree. It must be somewhere where it is also cooler. Shade itself doesn't always offer this alone. It needs to be much cooler environment.

Bob has indicated that he has further information, charts and photographs available. Go to : www.bobthebeeman.com.au Email - robertb.luttrell@bigpond.com

.....

Athol : Thank you Bob.

What a wealth of information everybody has shared with us today.

Asked for members to share experience of the extreme heat and their hives.

Member had 4 hives all in shade...lost the lot. One in tree log survived.

One member had 40 and lost 34...insulated with thick walls and didn't seem to make a difference.

Member noted that has hives in sun and some in shade...there for 10-15 years...noted that it is the time factor of extreme heat exposure that makes the difference.

There have been only 1 report that he knows of regarding log hives dying...old log, maybe due to the extreme heat cracking log and letting heat in and also letting in pests and disease.

Heat stress will lower the resistance to disease...so that could also contribute to weaker hive health during heat.

What timber transmits heat slower?

The lighter the timber the better insulator. Also should maintain a gap between walls for better insulation.

Member reported, has 4 hives, lost 3. The one that survived was within 10m from dam.

Maybe very close drinking water is important to combat extreme heat.

Member asked how long before you know hive has been affected? And how to save hives that are weakened? Brood may die before adults?? Generally, the adult bees will cover and protect temperature of the brod. If adults die brood will not develop. Watch for 7 – 10 days after the heat.

Athol: General Business:

Glenbo shared a photo he'd recently taken of Bembix wasps attacking a native bee hive. Unusual photo as it shows 18 wasps at the entrance at one time attacking the hive...not seen before. Very unusual to have any more than 2 or 3 wasps at one time. These are native wasps, but they hover in front of the hive, and attack and attach themselves to the native bees leaving the hive. If the bee they attach themselves to is a female, they let her go, they only (mostly?) take the males, and bring them back to their burrows (generally in sand) to deposit as food for their larvae / young.

(Photo on next page)

Glenbo : Announced the Ginger Factory "Ginger Festival" - Next Fri/Sat/Sun. Athol and he will be there on Saturday to assist Gayle (from the Factory) at 10:30am, with a talk on Native Bees In Your Garden. Please support...Also Super Bee, which has some fantastic staff there now, is really being passionate and educative about all-things-bees.

Gympie Garden show coming up...Valley Bees will have presence.

Gympie Show in May. Members please show support...need lots of entries.

February is Valley Bees Birthday month. 3 years! What a great effort . . . Cake time! Mind you, with all the fabulous cakes and goodies at every monthly meeting, it sometimes seems like we have 12 birthdays a year!!!

Native Bee Workshop

March 22nd (Saturday) Tim Heard will hold an all-day workshop at Gympie Landcare Nursery. Spots are limited. Please contact Glenbo if you wish to attend. There will be a flyer sent out soon to give full details, and for people to make bookings.

And remember : On Saturday 25th of January we will be placing a honeybee hive and stands at the Gympie Landcare Nursery where we can then hold future workshops for Valley Bees. We will also be holding a working bee on that same Saturady, for the Native BeeWall and BeeGarden at the Nursery.

Athol : May has now (from this year) been designated as Honey Month. If you have any ideas as to how to further promote honey, please contact us.

Glenbo : Please fill out the questionnaire on Native Bees and Heat Effects on your Hives ... for anyone who has lost a hive. The Questionnaire is also available on the www.mrccc.org.au website – just go to Valley Bees and download.

www.mrccc.org.au

Athol : Closing address and meeting adjourned at 3:00 for tea and further discussions.

We had a Sugarbag Honey tasting (6 different samples), along with 3 or 4 exquisitely unique honeybee honey samples to indulge in!

Raffle drawn.

