

CRC Agrichemical Use and Apiculture

Introduction:

Spraying of river beds while a necessity for the maintenance of braided river channels has a significant impact on the bee populations who share this environment. The use of river beds as sites for hive yards have a long history on the Canterbury Plains. River beds provide domestic and wild bees with a rich source of pollen and nectar during crucial periods of the ever changing seasons. As beekeepers we acknowledge the work being under taken within the river beds and generally support it, however there are a couple of issues which need addressing in this consent review:

1. How agrichemical use can impact bees and their honey
2. Addressing the loss of bees experienced by commercial beekeepers due to river spraying
3. Examples where the current consent has not been followed and resulting issues.
4. Recommendations to Appendix B.
5. Communication

How agrichemical use can impact bees and their honey

Honey bees are very susceptible to picking up agricultural compound from the environment due to their broad landscape scale foraging behaviours. This mechanism has been exploited by researchers to detect pollutants in the environment (Lambert et al., 2013). The collection of residues by bees has multiple implications for both bee health and more recently market access with residues found in bee products for human consumption.

Surfactants

The use of surfactants is shown to be harmful to bees particularly when sprayed directly over them. Lab trial carried out in NZ show that a range of surfactant types will affect bees and that these are likely to be harmful in a field situation (Goodwin and McBrydie, 2000). Surfactants are not currently required to go through a registration process for use in NZ, but Apiculture New Zealand would still like to see this requirement changed under the ACVM act. There is clear evidence on the detrimental effect of surfactants on foraging bees and if an application were made in an area where bees were foraging this would have a high chance of harming bees.

Recommendation: It is felt that the current conditions around surfactant use in the consent are sufficient to prevent harm to bees if they are complied with.

Residues

The detection of residue in bee products has become more of an issue in recent years with overseas markets focused on a high level of food safety (Apiculture New Zealand, 2021); (Radio New Zealand, n.d.). Glyphosate residues in honey are of the most concern currently but as bees are likely to pick up a range of residues from their environment. There is a need to ensure that all agrichemical used under this consent are used in a way that minimise residues. As discussed by Lambert et al., 2013, Bees are very likely to pick up residues present on what they are foraging on and therefore spraying in any area where bees are foraging is likely to result in these residues being present in bee products produced.

Recommendation: The current condition around spraying a minimum of 50m meters away from hives is fit for this purpose assuming that spraying is carried out in low wind conditions where spray will not drift.

Recommendation: Currently condition 3 in the consent only references that surfactants should not be discharged on to plants in flower. As other actives such as glyphosate used under this consent have a risk of becoming residues in bee products it is recommended that they should be added to this condition.

“There shall be no discharge of active chemical/s or surfactant onto plants in flower where honey bees are likely to be present if it has been demonstrated in field or laboratory tests and reported in published material that the surfactant is toxic to honey bees when discharged in accordance with the manufacturer's instructions”

EPA review of glyphosate in New Zealand

EPA are currently doing a consultation on the use of Glyphosate in NZ. The NZ Honey industry will be active participants in this consultation process as our export markets are reliant on glyphosate free honey and bee products moving forward.

<https://www.epa.govt.nz/public-consultations/open-consultations/glyphosate-call-for-information/>

References

Apiculture New Zealand, 2021. Glyphosate residues in honey.

Goodwin, R.M., McBrydie, H.M., 2000. Effect of surfactants on honey bees. New Zeal. Plant Prot. 53, 230–234. <https://doi.org/10.30843/nzpp.2000.53.3694>

Lambert, O., Piroux, M., Puyo, S., Thorin, C., L’Hostis, M., Wiest, L., Buleté, A., Delbac, F., Pouliquen, H., 2013. Widespread Occurrence of Chemical Residues in Beehive Matrices from Apiaries Located in Different Landscapes of Western France. PLoS One 8, 1–12. <https://doi.org/10.1371/journal.pone.0067007>

Radio New Zealand, n.d. Call for more strict glyphosate-use guidelines after Japan’s honey warning _ RNZ News [WWW Document]. URL <https://www.rnz.co.nz/news/political/434895/call-for-more-strict-glyphosate-use-guidelines-after-japan-s-honey-warning>

2. Loss of bees

As a commercial beekeeping operation Hantz Honey have experienced bee losses as a result of spraying along the river beds – this has occurred at beehive yards with the accumulation of a mass of dead bees out the front of beehives. This has happened a couple of times during the spraying period most seasons. All other sources of bee deaths were exhausted as the cause and it was determined death was the result of either direct spraying or spray drift. As commercial beekeepers we were unaware spraying of rivers was occurring at the time of bee deaths.

3. Examples where the current consent has not been followed and resulting issues

- Spraying has occurred in October / November outside the period “Carry out spray operations after December” – evidence from Apiary Field Manager from Hantz Honey sighting spraying

aircraft while working beehives in river areas. This is a critical build up period for beehives and a significant loss of bees at this time is detrimental to the health of the hive as a pollination beehive or honey production beehive.

- Communication to beekeepers along the rivers has been ad hoc and with very short notice where no action was able to be taken by the beekeeper to remedy harm to beehives located adjacent river beds see APPENDIX A.
 - CRC981580 CONSENT CONDITIONS Notification of spray programme14 (b) **has not been happening** “submitting of a copy of the annual spray plan” by the 1st of September.
 - RC041535 CONSENT CONDITIONS 8 (a); (b) & (c) **has not been happening** as a large commercial beekeeper we have not received a “Proposed Plan” by the 1st of August

4. Recommendations to Appendix B:

Rivers Environmental Guide

Section 1.7 Protecting Bees and Pollinators during Spraying

.... Through our procurement and consenting processes we strive to use substances that have the least impact on bees and other pollinators as possible, however given the nature of those substances there will always be some degree of impact if the application of those products is not carefully managed.

1. It is critical we **do not spray within 50m of bee hives** to reduce the risk of spray drift affecting large numbers of bees

2. We must also **not spray plants in flower when there are bees foraging on those flowers.**

3. *Time spraying to avoid the warmer parts of the day – Sunset is the best time for spraying to avoid bee activity. Sunset is best because the spray will sit on the plant for a period of time before bees begin flying the next day. If spraying is done early morning the bees will be on those plants sooner rather than latter which will lead to bee deaths*

4. *Do not spray when wind speeds increase the risk of spray drifting, when the 50m distance is not sufficient to protect the beehives.*

5. *There are beehives and wild bees in the river beds all year round. Spray operations should be carried out between January 1st- January 31st as this is the time when there are minimal plants flowering in the river bed and the least amount of beehives located in the river beds. This time period will also lessen the effect on wild/native bees living in the river beds.*

6. **Contact the local beekeeper** (if you know who they are) or the **Canterbury Branch of Apiculture NZ in advance of your planned spray event** so the keepers know you are going to spray. This allows them to either move their hives out of harm's way, or let you know where the hives are so you can avoid them. Point of contact is Canterbury Hub of Apiculture NZ on hub@apinzcanterbury.org.nz and provide them with the following info;

- a. Location of spraying (as much detail as possible)
- b. Timing and duration of spraying
- c. Products used

Note: These consent requirements 1-6 are not negotiable

Here are some symptoms that a hive has been poisoned:

- There are large numbers of dead bees at the hive entrance.
- Live bees outside the entrance may look sick and move slowly or jerkily.
- There are dead adult bees inside the hive (you will not see this however).
- The dead bees may have their proboscis fully extended, their hind legs outstretched behind them and their wings are at odd angles to their bodies.
- There are fewer foraging bees leaving the hive
- ~~The remaining bees may behave aggressively~~
- **Dead beehives - due to weak beehives, caused by loss of bees**

Appendix C

Existing consent conditions directly relevant to bees

14. (b) By 1 September of each year the consent holder shall submit a copy of the annual spray programme to:

i....

vii. ~~National Beekeepers Association – Canterbury Branch (does not exist)~~ **Canterbury Hub of Apiculture NZ**

8.

(a) The consent holder shall prepare a Proposed Plan for Herbicide Application (the Proposed Plan) **at least once per year**. The Proposed Plan shall identify the herbicide application areas for the coming year, proposed dates of application areas for the coming year, proposed dates of application, herbicides to be used and method(s) of application. The Proposed Plan shall be forwarded to the following parties by 1 August of each year or 4 months notice whichever is the longest:

i....

vii. ~~National Beekeepers Association – Canterbury Branch (does not exist)~~ **Canterbury Hub of Apiculture NZ**

5. Communication:

- Timing of communication is critical for commercial beekeepers, we need time to move hives if required. For example if hives have been worked they can't be moved **for at least 48** hours. The spraying occurs at our busiest time during the honey season so it is really important we get those initial Annual Spray Programme and Proposed Plan in the timeline indicated on the consent.
- Create a more comprehensive email spraying list to include industry bodies such as Canterbury Hub of Apiculture NZ, NZ AFB Agency, and individual beekeepers who nominate themselves to be added to the email list. The Canterbury Hub of Apiculture NZ are happy to coordinate this list on behalf of ECAN and keep it up to date.
- Communication with the NZ AFB Agency in my opinion is a necessity as they send staff called AP2s into these areas to inspect hives on a random basis so from a Health and Safety point of view they should be informed when spraying is going to occur near registered beehives.

6. Conclusion:

Using the same conditions with slightly more added detail will mitigate the negative effects of spraying river beds where domestic and wild bees live. This will protect the health of bees and minimise residues found in honey and bee products which are increasingly being identified and have recently affected NZ's honey export markets.

The Apiculture industry is following and undertaking research re: the ongoing issues with glyphosate in honey products for export, which is going to have ongoing implications for beekeeping in the future.

Improved communication between ECAN and beekeepers will address a number of issues which have been identified in this review and provide a good platform for working together in the future.

APPENDIX A

- The following email and above pdf attachments received from Jenny Plank, ECan:

"I'm the area engineer for rivers in the central region (south of Waimakiriri to the Hinds river) for Environment Canterbury. I can be contacted on this email address and on my phone at: 027 586 4765. I work in Christchurch a lot of the week, but I also work down in the Ashburton area 1 or 2 days a week. We have a depot in Ashburton at 4 McNally Street where some of our field staff and zone team are based. You can pop in and see Ryan Dynes the area supervisor if they you any questions and I'm not available. Ryan Dynes' number is 0274351476. Also, if you have any other river or river berm queries you can talk to us about these as well.

This email is just a heads up we are currently getting prices for doing heli spraying of the riverbed in the Upper Ashburton to start mid next week or the week after. It is likely to be 1 days spraying but until I have an agreement with the Helicopter company i won't know which day. Hopefully later this week I can get an indication of the exact date so that I can let you know (any date would then be subject to weather conditions). I have attached the areas where we will be spraying in a pdf. These rivers currently have a large amount of gorse and broom that needs to be sprayed out as islands are forming and reducing flow capacity and erosion issues. We are spraying under our consent CRC981580 which has various conditions including water testing etc. We will be contacting various other interested parties about this spraying but if you know of any other user groups or apiarists that might not be aware of our works please let us know how to contact them or share this information with them.

A positive side effect to the frequent high flows we have experienced within the central Canterbury region over the last few years is that a lot of our rivers have quite low woody weed coverage. There is quite a bit of wildflower coverage about but that has less effect on the river islands than the more woody weeds. This means that this financial year (year ending June 2019) we will only be aerial spraying in the Ashburton river when typically, we would have a more extensive program which would include Selwyn, Hinds and Rakaia Rivers. We will still be doing some ground-based spraying in some of these rivers to eradicate small patches of weeds as necessary throughout the season.

Please get in contact if you have any questions or require further information. Jenny Plank"

- This notice is dated the 31st of March 2021 and Spraying started April 7th 2021.



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Contributors and Authors of this report:

HANTZ HONEY

Barry Hantz -Director and Operations Manager – 20 years beekeeping, Past Chairperson of Canterbury Hub Apiculture NZ, Federated Farmers Bee Group;

Carolyn McMahon -Director and Compliance Manager, Member of Apiculture NZ Management Committee; and

Gary Burt - Apiary Field Manager – 40 years beekeeping along rivers and waterways Ashburton River, Rakaia River and Selwyn River.

Who are Hantz Honey?

- Third generation commercial beekeeping operation on the outskirts of Christchurch
- Over 70 years' experience running a commercial beekeeping operation in the ECAN Catchment area
- Produce clover honey, with over 4000 hives and 1000 nucs
- Hives cover a wide geographical area, from north of the Selwyn River to north of the Ashburton River. Bee hives and nucs are located along the Rakaia River, Ashburton River and Selwyn River
- Process and pack all clover honey on site
- Second biggest pollinator of brassica crops in Canterbury, where 70% of the worlds' brassica seeds are produced
- Located in Lakeside, Leeson 35 km south east of Christchurch

MIDLANDS APIARIES

Martin Laas- Research Apiarist, Midlands Apiaries Ltd, Ashburton; Member, Science and research focus group, Apiculture NZ; Member, Apiculture NZ Canterbury Hub Management Committee.

Midlands Apiaries Ltd operated 6,500 beehives within the Mid Canterbury and Selwyn areas primarily focusing on pollination services for the arable industry and the production of honey for export.