

15th December, 2016

Submissions Hazardous Substances
Environmental Protection Authority of New Zealand
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Wellington 6140

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Dear Sir/Madam,

Submission; APP202349 chlorothalonil home garden products

1. The Apiculture NZ Technical Focus Group (ApiNZ TFG) wishes to thank the EPA for the opportunity to make a submission on this application. It is not often we are given the opportunity to comment on fungicide applications, which are of concern to beekeepers.
2. It is disappointing to read the application document and realise that the EPA has not conducted "...a quantitative environmental exposure and ecological risk assessment...". P4 application. ApiNZ TFG recommends that the EPA conduct this assessment before a Public Hearing as it is a major oversight (see item 9 below). The reasons for this are that home gardens are important foraging areas for honey bees, not only in country areas but significantly in urban areas;
 - a. Urban beekeeping involves a large number of beekeepers often with only a few hives. Any pesticide effect on the health of these hives is significant for the beekeeper.
 - b. Membership of bee clubs is growing significantly in NZ.

Table 1; Sample Membership of urban bee clubs

| Beekeeper Clubs | Membership |
|----------------------|------------|
| Whangarei | 300 |
| Auckland Bee Club | 650 |
| Franklin Bee Club | 219 |
| Manawatu Bee Club | 200 |
| Wellington Bee Club | 380 |
| Dunedin Beekeepers | 70 |
| Southland Beekeepers | 93 |

The majority of these beekeepers keep their hives in or adjacent to urban areas which has significant home garden activity. They do not have a large number of hives per beekeeper compared with commercial beekeepers, but they do make up the majority of beekeepers in NZ.

- c. Urban areas provide excellent foraging areas for honey bees as flowering plants are a preference for home gardeners. Home gardens also produce a significant variation in nectar and pollen, which are excellent sources of nutrition for honey bees. The use of home garden pesticides present an increasing hazard to foraging bees.

3. ApiNZ TFG accepts the Human Health reasons given by the EPA for this reassessment. This is an important risk to all who come in contact through the use of chlorothalonil. This ApiNZ TFG submission points out that Ministry of Primary Industries Food Safety has not included any honey bee food products for chlorothalonil in their Food Notice; Maximum Residue Levels for Agricultural Compounds - October 2016¹. This submission will present evidence that chlorothalonil does enter the hive and has been detected in honey bee products, particularly in pollen.
4. Fungicides have been treated lightly in previous environmental ecotoxicity assessments. And as a result all these home garden products have next to no warnings for harm to honey bees and other beneficial pollinators. Table 1; All data was sourced from labels on the MPI website² – ‘ACVM register - veterinary medicines, agricultural chemicals and vertebrate toxic agents’.

Table 2: Label warnings

| EPA Approval # | Trade Name & ACVM Registration # Date of first registration. | Label warning to protect pollinators |
|----------------|---|---|
| HSR000480 | Yates BRAVO P2945 14/4/1980 | There is no warning statement. Recommends spraying during flowering of stone fruit and ornamentals |
| HSR000147 | Yates Greenguard P4469 1/09/1992 | There is no warning statement. Recommends spraying at flowering for ornamentals and fruit trees (brown rot). |
| HSR000586 | Yates Guardall P4666 12/8/1994 | There is no warning statement. Contains the synthetic pyrethroid acaricide tau-fluvalinate which has known toxicity to bees. Recommends for Stone fruit “Brown rot (apply at flowering)”. |
| HSR000618 | Zelam Taratek 5F 04/01/1990 | There is no warning statement. Beans. “Apply at first flower and again at full flower” |
| HSR000872 | Tui Disease Eliminator (RTU) 20/03/2014 | There is no warning statement. Recommends spraying at flowering for stone fruit (brown rot). |

Note; there are other trade name products marketed that use the same EPA Approvals.

5. Of concern to ApiNZ TFG is that since these products were first registered as fungicides (BRAVO was first registered in 1980) in New Zealand no new information about chlorothalonil has become available from the proprietors of these products. They have failed to notify the EPA of this information. This includes the information on toxicity to human health and ecotoxicity to honey bees.

¹ <http://www.foodsafety.govt.nz/elibrary/industry/register-list-mrl-agricultural-compounds.htm>

² <https://eatsafe.nzfsa.govt.nz/web/public/acvm-register>

It appears that there has been no notification or updates supplied to the EPA by these product proprietors and no enforcement by the EPA to ensure that they are correctly notified and updated with this information. Hence the EPA has initiated this process of reassessment.

6. Chlorothalonil was discovered to be the most common fungicide detected in bee hives as the result of two surveys of beehives in the United States and Canada.
In 2010 Mullins et al³ identified high levels of miticides and pesticides in samples from migratory and other beekeepers across 23 states and one Canadian province. Their data showed that in 887 wax, pollen, bee and associated hive samples there were high levels of 'in hive acaricides' (used to control the pest *varroa destructor*) and the fungicide chlorothalonil (not used in hives). The researchers noted that the high levels of chlorothalonil in pollen and wax occurred in 47% of the samples analysed.
The researchers did not set out to identify the effects of these high levels but speculated on lethal and sub lethal effects on hive health.
7. Subsequent work in 2013 by Pettis et al⁴ who sampled pollen was collected from bees returning to their hives from at least 7 different crops. The pollen was analysed for the pesticides it contained and then bee health was assessed. All the pollen analysed was from commercial crops that were pollinated by honey bees – almonds, apples, blueberries, cranberry, cucumber, pumpkin and water melon. 100% of the pollen samples analysed had residues of insecticides and fungicides and 23.4% had herbicide residues. Analysis of healthy bees from the hives was conducted by infecting them with for the bee *Nosema spp* pathogens (*Nosema apis* and *Nosema ceranae* both present in NZ) and these bees were fed pollen samples collected above as well as a control pollen sample.
Results showed that a pollen with high pesticide loading of the fungicide chlorothalonil increased the infection rate of *Nosema*.
“*Nosema* infection was more than twice as likely (relative risk > 2) in bees that consumed these fungicides than in bee that did not.”
Their conclusion is that regulators need to consider the effects of fungicides on bee health when bees are exposed to pollen that has been sprayed. This data is sufficient one would think for the proprietors of the products, listed in Table 1, to remove their label recommendations to spray during flowering and post a warning to home gardeners that their fungicide could be a hazard to foraging bees. See item 5 of this submission above.
8. Zhu et al 2014⁵ determined in an analysis of 4 pesticides and one inert (solvent) that honey bee larvae were more sensitive to chlorothalonil compared to adults. This was compared with three widely used insecticides, showing that the fungicide effects on bee larvae are significant.

³ Mullin CA, Frazier M, Frazier JL, Ashcraft S, Simonds R, vanEngelsdorp D, et al. (2010) High Levels of Miticides and Agrochemicals in North American Apiaries: Implications for Honey Bee Health. PLoS ONE 5(3): e9754. doi:10.1371/journal.pone.0009754

⁴ Pettis JS, Lichtenberg EM, Andree M, Stitzinger J, Rose R, vanEngelsdorp D (2013) Crop Pollination Exposes Honey Bees to Pesticides Which Alters Their Susceptibility to the Gut Pathogen *Nosema ceranae*. PLoS ONE 8(7): e70182. doi:10.1371/journal.pone.0070182

⁵ Zhu W, Schmeihl DR, Mullin CA, Frazier JL (2014) Four Common Pesticides, Their Mixtures and a Formulation Solvent in the Hive Environment Have High Oral Toxicity to Honey Bee Larvae. PLoS ONE 9(1): e77547. doi:10.1371/journal.pone.0077547

“Dietary chlorothalonil killed more than 50% of larvae in 6 days at a level of 34 mg/L, a nontoxic dose to adult bees in acute bioassays”.

We believe that regular reassessment of the ecotoxicity of the fungicide chlorothalonil should have been conducted well before this reassessment. The onus being on the proprietors of these products to provide this information to the EPA. Above all home gardeners and beekeepers should have been made aware of the health risks of chlorothalonil to the honey bee.

9. The ApiNZ TFG has identified that none of the products containing chlorothalonil in New Zealand have any controls in place to protect honey bees. All permit direct spray application on flowers which bees may be foraging for pollen. Based on the non-existence of suitable controls to prevent exposure to plant flowers, we do not support the continued use of these products in the home garden environment.

It is noted that continued use of chlorothalonil fungicides will be permitted by the EPA where use is under the supervision of an approved handler and in commercial crops. If this is the case we would like to ensure that sufficient controls are put in place to ensure that the exposure to honey bees used to pollinate those crops are put in place. It is therefore disappointing that the EPA has no intention to conduct an environmental risk assessment for products that contain this active ingredient.

Ideally there should be no commercial crop applications when these crops are flowering and bees are likely to harvest pollen from these crops.

10. The Apiculture NZ Technical Focus Group makes the following recommendations to the EPA with respect to this application.
- ApiNZ TFG supports the EPA proposal to withdraw these home garden products from the market in New Zealand.
 - Apply a control to chlorothalonil products used in commercial horticulture to prevent spraying during flowering of the crop when bees may be foraging that crop.
 - That the EPA conduct a full and up to date quantitative environmental exposure and ecological risk assessment for chlorothalonil and apply those findings to the present controls for all existing and future uses. The EPA cannot suggest ‘business as usual’ (spraying when plants are in flower) in the commercial sector and know that chlorothalonil tainted pollen is killing bee larvae.
 - Conduct a review of why the 2014 Evaluation and Review Report for APP202057 did not include any data on effects on terrestrial organisms, especially honey bees.

The Apicultural Industry Technical Focus Committee would like to reserve the right to be heard at a Public Hearing for the consideration of this substance as described in APP202349.

Thank you for considering our submission.

Yours faithfully



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