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BEES GIVING LIFE

APICULTURE NEW ZEALAND

Glyphosate residues in Honey.

Christchurch 27th August

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ApiNZ Science & Research Focus Group

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- **Prof. John McLean** PhD. Retired Professor of Entomology University of British Columbia, Vancouver. Gisborne.
- **Don MacLeod**. BA. Amateur beekeeper, Franklin.

Apiculture NZ Science and Research Focus Group

Our purpose;

The Science and Research Focus Group's purpose is to ensure that the New Zealand apiculture industry benefits from relevant research undertaken both in New Zealand and overseas.
https://apinz.org.nz/our-work/science-and-research/

Our Work

- Promoting new research on NZ bees.
- Varroa control
- Wasp bio-control
- Giant Willow Aphid bio-control
- Reviewing the MPI definition on Manuka Honey
- Submissions to EPA and MPI through advocacy on issues of pesticides affecting NZ honey bees & products.
- Following up bee kills.
- Educating beekeepers

Beekeepers are significant exporters

- 2018 exports of honey worth $348 million.

Kiwifruit	$1,861 million	Wine	$1,694 million
Apples & Pears	$ 745 million	Vegetables	$ 622 million
Arable Seeds and Grains	$243 million		

MPI & Stats Department figures. Situation and Outlook for Primary Industries June 2019

- All our bee products when used for food are analysed for chemical residues in these markets;

USA	Canada
Europe	Taiwan
Korea	Japan
China	

- NZ does not analyse food shipments for residues when they are exported.
- NZ does not analyse food shipments for residues when they are imported.

One carton of beef

“Carl Houghton, of Waimauku, west of Auckland, pleaded guilty in Waitakere District Court to two charges under the Animal Products Act and one charge under the Agricultural Compounds and Veterinary Medicines Act. Last Friday he was fined $5000 for each offence.

Houghton used the plant pesticide endosulfan as a non-approved animal spray on cattle at his farm leading to the suspension of New Zealand beef exports to Korea in September 2005.

Judge Lindsay Moore told Houghton: "Anyone with any understanding of the importance of the meat trade to New Zealand can only see in what happened here a disaster of national importance.”

http://www.stuff.co.nz/national/53701/15-000-fine-for-farmer-who-triggered-Korean-beef-ban

- The Koreans detected one carton of contaminated beef, traced it back to the AFFCO Meat Plant at Moerewa and then to the farmer.
- Korea was the second most important beef market for NZ in 2005.
- All exports to Korea were banned as a direct result.

NZ Cereal Testing

The NZFSA investigated glyphosate and its residues in NZ domestic and imported wheat in the 2003/4 year. Testing was by AgriQuality.
Eighty samples were tested for glyphosate and its degradation product AMPA.
40 samples from NZ and 40 samples from imported wheat.
Results;
Australia (nil residues) no results exceeded the default,
NZ north, NZ south (mostly nil residues), 4 residues exceeded the default
Canada (all results positive for residues). 6 samples tested.
The default 0.1 ppm
https://www.mpi.govt.nz/dmsdocument/10367-survey-of-glyphosate-and-its-degradation-product-ampa-residues-in-wheat

The 2015/2016 Report on Pesticides in Fresh and Frozen Produce. A survey under the Food Residues Surveillance Programme (FRSP)MPI Technical Paper No: 2017/33.
https://www.mpi.govt.nz/dmsdocument/19922-the-20152016-report-on-pesticides-in-fresh-and-frozen-produce-a-survey-under-the-food-residues-surveillance-programme-frsp
60 wheat samples were tested and 20 were non compliant with MRL for glyphosate.
The MRL is 0.1 mg/kg

Glyphosate in Honey

- USA
  - 2014, study found glyphosate in 41 of 69 samples of honey tested. 45% of organic honey samples contained glyphosate. Rubio F, Guo E, Kamp L (2014) Survey of Glyphosate Residues in Honey, Corn and Soy Products. J Environ Anal Toxicol 5: 249. Doi: 10.4172/2161-0525.1000249
  - USFDA detected glyphosate in honey in 2015 https://www.huffpost.com/entry/fda-finds-monsantos-weed_b_12008680
- Canada
  - 2019 - 98.5% of 200 honey samples tested contained glyphosate. Thomas S. Thompson, Johan P. van den Heever & Renata E. Limanowka (2019) Determination of glyphosate, AMPA, and glufosinate in honey by online solid-phase extraction-liquid chromatography-tandem mass spectrometry, Food Additives & Contaminants: Part A, 36:3, 434-446, DOI: 10.1080/19440049.2019.1577993
  - The Canadian Food Inspection Agency reported glyphosate in 29.7% of 3,188 food samples tested in 2015–2016. http://www.inspection.gc.ca/food/chemical-residues-microbiology/food-safety-testing-bulletins/2017-04-13/executive-summary/glyphosate-testing/eng/1491846907641/1491846907985

Hawaii Study

Berg CJ, King HP, Delenstarr G, Kumar R, Rubio F, Glaze T (2018) Glyphosate residue concentrations in honey attributed through geospatial analysis to proximity of large-scale agriculture and transfer off-site by bees. PLoS ONE 13(7): e0198876. https://doi.org/10.1371/journal. pone.0198876

- Study conducted on the Hawaiian Island of Kaua'i.
- Honey samples taken from frames in the hive.
- The area for a 1 km radius round the hive was extensively mapped to determine land use.
- The actual process of how Kaua'i bees obtained, carried and processed glyphosate is not known and was not addressed in this study

Results

- Large scale agriculture land use showed a strong positive correlation with glyphosate concentration in honey.
- High glyphosate concentrations were also detected when extensive golf courses and/or highways were nearby.
- Open, Suburbs, Urban, and Forest land use all showed weak negative correlations.
- Wetland and Water land use showed very weak positive correlations.

What can the beekeeper do? Part 1

These are some options a beekeeper can pursue;

- Do not use glyphosate for weed control round your hives.

- Traceability - your hive's history is your honey's history;
  - The provenance of your hives is important for the marketing success of your honey. Customers want traceability.
  - 'Provenance is the chronology of the ownership, custody or location of a historical object'. Wikipedia.

- Separation of pollination hives and honey hives.
  - High value honey hives should not be near intensive cropping areas to reduce pesticide contamination of honey.
  - Charge more for pollination in intensive cropping areas - that honey maybe worthless to your honey buyer if it has to high residues.
  - Test each honey batch for pesticide residues before blending.

What can the beekeeper do? Part 2

- **Communication**
  - Talk to your cropping farmers.
    - Tell them that your bees can gather his agri chemicals from the environment.
    - Discuss programmes that will help theirs and your production.
  - Ask them for details of their spray programme for your apiary diary.
    - Their spray programme is also your spray programme.

- **Communication**
  - Talk to your honey buyer/exporter at the start of the season.
    - Understand his overseas customers needs.
    - Produce honey to the overseas customer's standards.
    - Explain your challenges, especially with pesticide use.

- Be open & transparent, listen.

PUBLIC OUTRAGE

- “My generation is no great example for understanding - we have done terrible things," said Sir David Attenborough. http://globaloptimism.com/podcast/
- Our outrage has been successful in bringing about the cessation and use of many chemicals.

- Example; Major public outrage in Europe with respect to neonicotinoid effects on bees.
  Result COSTCO and other major retailers in Europe demanded NZ growers do not use neonicotinoid foliar sprays on Kiwifruit and Pipfruit.
  - Zespri and NZ Apple & Pear, removed these products from their spray programmes.
  - Zespri is now following a non spraying programme during flowering/pollination.
- European retailers wish to avoid these debates about their produce.

The future - based on the Kiwifruit, Apple & Pear Industry. How to work with your largest customer?

- **GAP Regime -** implemented by the large overseas customers - COSTCO, Aldi, Sainsbury, Tesco, Toyota Trading etc.
- **Auditing** - Growers and Packhouses are audited on a regular basis. It takes 2 days to audit a Kiwifruit Packhouse at the Packhouse's expense.
- **More than just Food Safety** - COSTCO GAP audits include staff welfare, staff amenities, wage rates, health and wellbeing etc.
- **Tracing** - every export shipment tray of fruit can be traced back to the orchard it was grown. Note; they do not mix the fruit up!
- **Testing** - all kiwifruit is tested for pesticide residues on entry to the packhouse.
  All graded and exported kiwifruit is tested for pesticide residues before loading for export. All testing at the growers expense.
  If a product exceeds the MRL in the destination country it is not shipped.

GAP - Coming to Apiculture near you

- ISO/TC 34/SC 19 Bee Products

  Scope Standardization of the whole process and circulation of bee products, including but not limited to the following: products standards, basic standards, beekeeping practices, quality standards, testing method standards and storage and transportation standards. https://www.iso.org/committee/6716626.html
  Food safety standards are excluded (already covered in TC 34/SC 17)

- ISO/TC 34/SC 17 Management systems for food safety

  Scope Standardization in the field of food safety management systems, covering the food supply chain from primary production to consumption, human and animal foodstuffs as well as animal and vegetable propagation materials.
  https://www.iso.org/committee/583916.html

What do we know today

- Glyphosate is a widely used herbicide especially in large scale agriculture and horticulture.
- There are 91 registered glyphosate products and 32 suppliers in NZ. All trying to get a slice of the market. Glyphosate is off patent.
- Bees can gather glyphosate in a number of ways; being sprayed whilst foraging, gathering nectar from spray contaminated flowers or nectar formed from glyphosate contained plant sap; drinking contaminated water on plants or on the soil. Unknown.
- Glyphosate is not toxic to bees.
- To make honey bees require honey and water.
- New Zealand honey is being contaminated with glyphosate

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