New Zealand Food Safety
Haumaru Kai Aotearoa

New Zealand National Chemical Residues Programme Report

Results for agricultural compound residues in honey

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1 Summary

In the 2017/2018 National Chemical Residues Programme (NCRP) programme year, New Zealand Food Safety received the results of a survey of 300 raw extracted archival and retail packed honey samples for glyphosate residues. In the 2018/2019 programme year, New Zealand Food Safety conducted a targeted survey of 60 monofloral and multifloral mānuka retail packed honey samples for glyphosate residues.

The surveys found the majority of honey samples tested did not contain any residues of agricultural compounds above the laboratory limit of reporting. Furthermore, in cases where residues were found, the majority of samples complied with either the maximum residue levels established in the Food Notice: Maximum Residue Levels for Agricultural Compounds or the default maximum residue level in the Food Regulations 2015.

The Food Regulations default maximum residue level applies when there is no maximum residue level specified for a food in this notice. The Food Regulations also prohibits the sale of food containing residues of agricultural compounds where the residue level is above any maximum residue level. While the Food Regulations are applicable within New Zealand, some overseas jurisdictions have specified different maximum residue levels applicable in their jurisdictions.

Of the 300 archival and retail packed honey samples tested, the majority (233 samples or 77.7%) did not contain any glyphosate residues above the laboratory limit of reporting. Residues did not occur more frequently in any geographic region within New Zealand, but did occur more frequently with clover or pasture floral types.

Five samples (less than 1.7%) of raw extracted (unblended or unprocessed) honey samples contained glyphosate residues which could have been above regulatory levels if offered for sale.

None of the retail packed samples purchased were found to contain glyphosate residues above regulatory levels. This indicates the normal industry processing is mitigating the risk of residues.

As in the 2017/2018 survey, none of the retail packed samples purchased in 2018/2019 contained glyphosate residues above regulatory levels. Eleven samples (18.3%) contained residues between the laboratory limit of reporting and the regulatory levels.

When compared with internationally reported studies of the incidence of glyphosate residues in honey, the frequency with which residues are found and the amount of residues found in New Zealand produced honey is comparable or lower. However, for honey traded in international markets, there can be a consumer perception and trade risk associated with the presence of any residues.

In addition, New Zealand Food Safety received the results for a new test method for the analysis of 474 agricultural compounds, including insecticides, fungicides, herbicides and environmental contaminants in honey.
In 2017/2018 and 2018/2019, 89 raw extracted honey samples were tested by this method for the wider range of agricultural compounds. None of the samples contained any residues above the laboratory limit of reporting.

New Zealand Food Safety undertook a dietary intake assessment of all the results. This review concluded none of the glyphosate residues in honey had any food safety concerns.

Based on reported honey types, the most likely cause of the residues in honey is attributed to unintended exposure of honeybees to glyphosate from its approved use in agriculture. This causal attribution is in comparable with previous international reports. As a consequence, beekeepers have little practical means of excluding bees from foraging on plants treated with glyphosate.

2 National Chemical Residues Programme

The NCRP is a risk-based programme, monitoring the prevalence of residues and contaminants in animals, animal material and animal products.

The programme objectives are to:

- provide domestic consumers and export markets confidence about the quality, safety and integrity of New Zealand animal products in relation to dietary exposure to residues and contaminants and compliance with the applicable standards;
- confirm whether the New Zealand Food Safety system for the control of residues and contaminants is working as designed; and
- support official assurances for exported animal products.

The NCRP consists of:

- a monitoring programme – involving the collection and testing of randomly allocated or, in specific cases, targeted samples from healthy live animals, animal material, animal products and honey;
- a surveillance programme – involving the collection and testing of samples from targeted animals, animal material or animal products suspected to pose a risk of residues greater than maximum levels; and
- research, development and survey programmes – involving individual projects designed to enhance the overall capability of the national programmes. It includes contracts for the development of new analytical methods and the operation of surveys to assess risks that may be associated with particular residues or contaminants.

The NCRP is designed to:

- assess the effectiveness of New Zealand controls and practices which ensure the residue status of animal material and animal products complies with New Zealand requirements;
- identify when and why national or industry controls have failed and ensure appropriate corrective measures are implemented;
- identify the prevalence of residues above maximum levels or contaminants in animal material and animal products and manage any food safety risk; and
- implement trace back investigations to identify the cause of residues above maximum levels and allow for targeted sampling and testing until the risk source is no longer a risk.

The animal types, numbers of animals, animal products or animal material to be sampled and substances to be analysed in the monitoring programme are dependent upon the risk profile of the residue or contaminant in the animal type concerned.

The risk criteria used for the selection of substances to be sampled for the NCRP include:

- farming practices in New Zealand;
- new registrations of active ingredients and substances, or changes to existing registrations that impact the residue profile;
- toxicity of the substance;
- exposure routes, including feed and environment;
- potential for misuse or abuse;
- persistence in the environment;
- previous monitoring frequencies and findings (across both New Zealand Food Safety and industry programmes);
- availability of a regulatory analytical method;
- international concern about residues of the substance; and
- regulatory requirements of international markets.

Information is regularly gathered about new compounds, risks, analytical methods and instrumentation. These are used to include new testing regimes in the NCRP.

3 Agricultural compound residue monitoring and glyphosate surveys

In 2014, Rubio *et al*[1], published the results of the survey of glyphosate residues in honey, soy and corn products. This study primarily targeted samples of United States origin, but the researchers also tested samples from other countries, including New Zealand. The researchers, using the study sponsor's proprietary immunoassay methodology, reported glyphosate residues in the majority of honey samples tested, including two of the three samples labelled as of New Zealand origin.

In 2015, members of the former Bee Product Standards Council, alerted New Zealand Food Safety to concerns over an increase in glyphosate testing by their customers in European markets and to the active marketing of glyphosate residue testing by European commercial laboratories.

In 2016, in response to these concerns New Zealand Food Safety initiated a survey of glyphosate residues in New Zealand honey. The purpose of the survey was to identify the absence or presence, extent and distribution of glyphosate residues in New Zealand origin honey, inform New Zealand Food Safety of potential risk sources that could pose food safety and/or market access risks, and evaluate the need for regulatory risk management measures.

The first step was commissioning the AsureQuality Food and Contaminants Laboratory[2] to develop a testing methodology in New Zealand for glyphosate residues. The laboratory developed a quantitative, confirmatory test based on liquid chromatography tandem mass spectrometry (LC-MS/MS) instrumentation and verified it to international standards in terms of accuracy and reproducibility of results.

In early 2017, New Zealand Food Safety directed the AsureQuality laboratory to begin testing samples using the new validated glyphosate test method. New Zealand Food Safety selected samples collected as part of routine monitoring under the NCRP from January 2015 and June 2016 for glyphosate testing. In addition, New Zealand Food Safety purchased 30 honey samples from retail outlets to include in the survey. In August 2017, New Zealand Food Safety received the final set of results from the laboratory.

In December 2017, the AsureQuality laboratory completed verification of a separate new test method for the analysis of a wider range of agricultural compounds, including insecticides, fungicides, herbicides and environmental contaminants in honey. The method allowed the number of agricultural compounds, their metabolites and breakdown products analysed in honey to be increased from 79 in 2017 to 474 in 2018. The method was used to test 89 raw extracted honey samples from the 2017/2018 and 2018/2019 programme years.

In June 2019, New Zealand Food Safety initiated a further targeted survey of 60 monofloral and multifloral mānuka retail packed honey samples for glyphosate residues. The sample size of 60 was selected for the 2018/2019 survey because the 2017/2018 survey had identified a potential rate of detected residues within the population of greater than 5%. For the 2018/2019 survey, R J Hill Laboratories was contracted for delivery of the testing services, using methodology with equivalent limits of reporting.

4 What we tested

In 2017/2018, 270 raw extracted honey and 30 retail packed honey samples and in 2018/2019, a further 60 retail packed samples, were included in a targeted survey of monofloral and multifloral mānuka for glyphosate residues.

In 2017/2018 and in 2018/2019, 89 raw extracted honey samples were tested for an additional 474 agricultural compound residues, not including glyphosate. All samples were labelled as of New Zealand origin.

[1] Rubio F, Guo E, Kamp L (2014) Survey of Glyphosate Residues in Honey, Corn and Soy Products. J Environ Anal Toxicol 4:249. http://dx.doi.org/10.4172/2161-0525.1000249

[2] Note: the AsureQuality Food and Contaminants Laboratory is contracted by MPI to provide agricultural compound testing services in honey for the National Chemical Residues Programme as part of the MPI Services Agreement: 18077.

A sample size of 300 was used as it provides a 95% confidence level of being able to detect a residue in randomly selected samples from a population, assuming the rate of detectable residues within that population is 1% or greater.

In 2017/2018, raw extracted honey samples were collected from risk management programme (RMP) premises as part of routine monitoring under the NCRP from the 2015 and 2016 seasons. 270 of these samples were selected for glyphosate testing based on availability of remaining material, geographic and floral type coverage.

These raw extracted honey samples were collected by New Zealand Food Safety authorised persons from recognised agencies at the same time as the RMP verification audits. These samples are collected from raw honey either extracted or stored at the RMP site. Samples are permitted to be taken from extractors, sumps, tanks, drums or bulk honey containers randomly selected by the New Zealand Food Safety authorised persons. Samples are preferentially collected from raw honey extracted in the current season, but can also be collected from honey stored at the RMP site from previous seasons, if current season honey is not available at the time of the audit visit.

New Zealand Food Safety purchased 30 retail honey samples of a variety of floral types at retail outlets in both the North and South Islands as well as online. These 30 retail packed samples were included in the 2017/2018 survey with the 270 raw extracted samples and tested as single cohort of 300 samples.

In 2018/2019, New Zealand Food Safety purchased 60 retail packed honey samples from retail outlets in Auckland, Christchurch and Wellington as well as online. All samples were either labelled as monofloral or multifloral mānuka honey.

A sample size of 60 was used as it provides a 95% confidence level of being able to detect a residue in randomly selected samples from a population, assuming the rate of detectable residues within that population is 5% or greater.

All samples for both surveys were maintained in secure storage conditions. Glyphosate is relatively stable to chemical and photo decomposition[3]. Summaries of the samples, results and laboratory limits of reporting are presented in the Appendix.

5 What we found

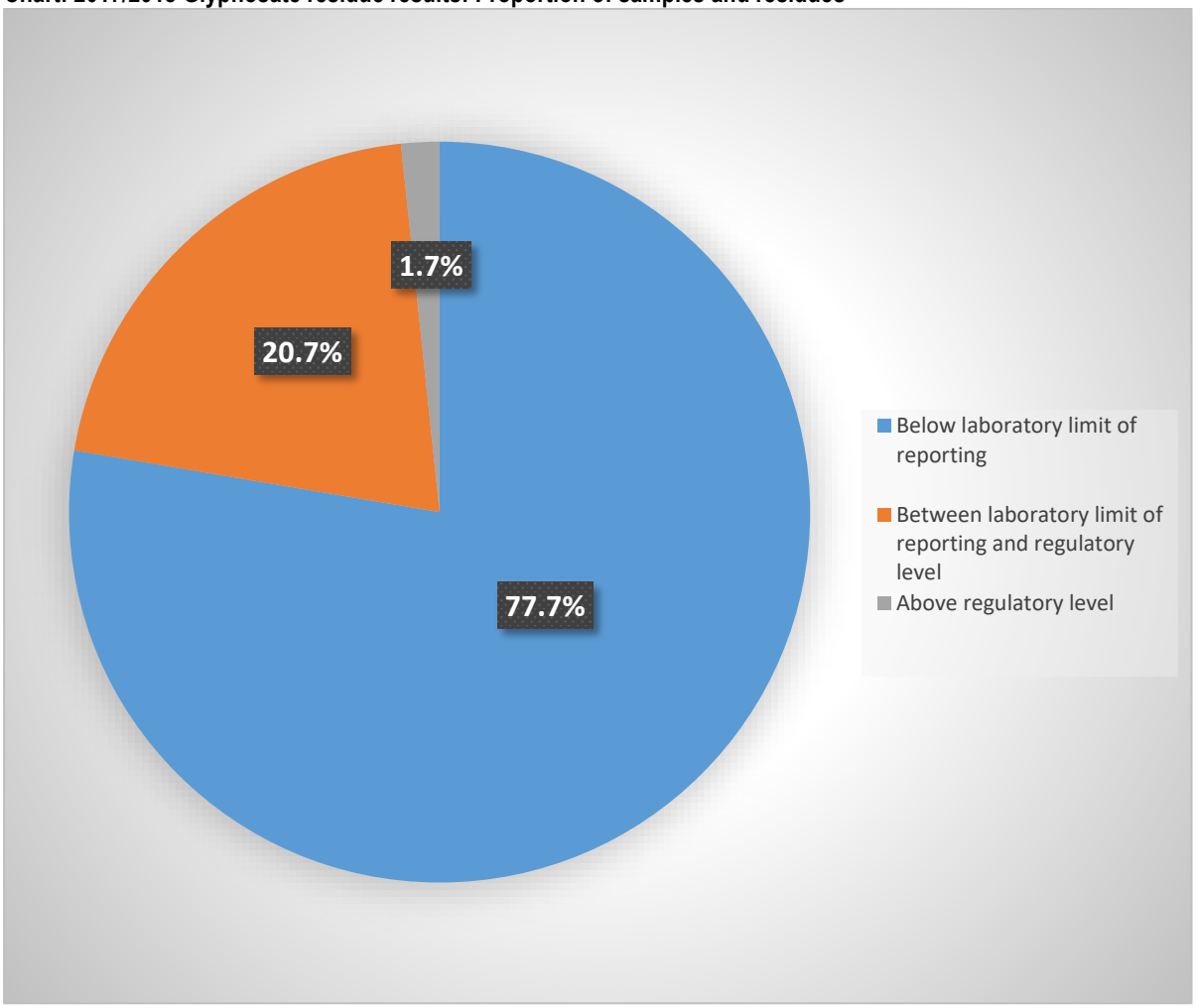
5.1 2017/2018 GLYPHOSATE RESIDUE RESULTS

The majority (233 samples or 77.7%) of honey samples tested did not contain any glyphosate residues above the laboratory limit of reporting. Five samples (less than 1.7%) of raw extracted (unblended or unprocessed) honey samples contained residues which could have been above regulatory levels if offered for sale.

None of the retail packed samples purchased contained residues of glyphosate above regulatory levels. Sixty-two samples (20.7%) contained residues of glyphosate between the laboratory limit of reporting and the regulatory levels.

[3] Glyphosate Technical Fact Sheet, National Pesticide Information Center. http://npic.orst.edu/factsheets/archive/glyphotech.html

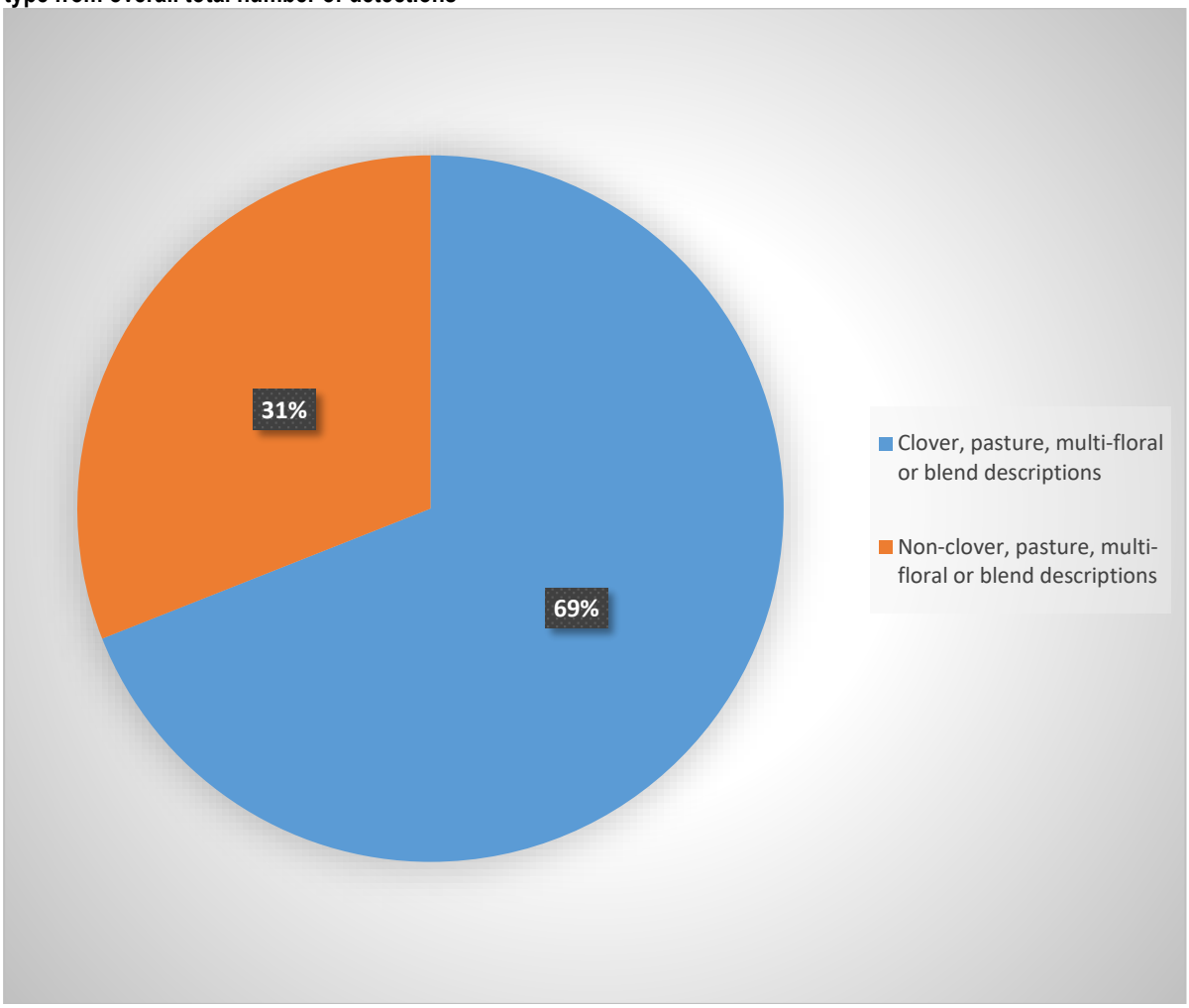
Chart: 2017/2018 Glyphosate residue results: Proportion of samples and residues



The Food Regulations default maximum residue level applies when there is no maximum residue level specified for a food in a notice. The Food Regulations also prohibits the sale of food containing residues of agricultural compounds where the residue level is above a maximum residue level. While the Food Regulations are applicable within New Zealand, some overseas jurisdictions have specified different maximum residue levels applicable in their jurisdictions. For honey being traded in international markets, there can be a trade risk associated with the presence of any residues.

The majority (69%) of honey samples containing glyphosate residues were source-attributed to clover and pasture honeys, or multi-floral/blend honeys likely to contain clover or pasture honey. While samples described on product labels, or by RMP operators, as ‘clover’ made up 15% of all samples included in the survey, they made up 30% of samples containing residues. Of all clover samples included in the survey, 48% contained glyphosate residues. In addition, all of the samples containing glyphosate residues above the default maximum residue level specified in the Food Regulations were raw extracted (unblended or unprocessed) clover or pasture honeys.

Chart: 2017/2018 Glyphosate residue results: Proportion of detections above laboratory limit of reporting by floral type from overall total number of detections



Analysis of the RMP operator location as provided to New Zealand Food Safety for the purposes of listing was undertaken to determine if an association between the presence of residues and physical location of the RMP operator could be determined. Review of results did not show a connection between the presence of glyphosate residues and geographic locations of RMP premises. The locations of the RMP premises are corresponding to the physical addresses of honey extraction facilities where the samples were collected and may not relate to the location of apiaries or hives. Beekeepers can transport hives from a number of locations to the extraction facility.

Table: 2017/2018 Glyphosate residue results: Summary of floral type, number and proportion of residues detected

RMP operator description or product label	Number of detections above laboratory limit of reporting (all concentrations)	Percentage of detections above laboratory limit of reporting by floral type from overall total number of detections	Percentage of number of detections above laboratory limit of reporting by floral type from total number of samples of each floral type in survey
Bush	1	1%	[4]
Bush blend	2	3%	[4]
Bush blend/ Pohutukawa	1	1%	[4]
Clover	22	27%	48%
Honeydew	1	1%	[4]
Kānuka	1	1%	[4]
Kānuka/ bush	1	1%	[4]
Liquid	2	1%	[4]

[4] Insufficient number of samples (n < 20) included in survey to evaluate.

RMP operator description or product label	Number of detections above laboratory limit of reporting (all concentrations)	Percentage of detections above laboratory limit of reporting by floral type from overall total number of detections	Percentage of number of detections above laboratory limit of reporting by floral type from total number of samples of each floral type in survey
Mānuka	17	24%	16%
Mānuka blend	1	1%	[4]
Mānuka/ Clover	1	1%	[4]
Multifloral	8	12%	38%
n/a	4	6%	11%
Pasture	4	6%	[4]
Pohutukawa	1	1%	[4]
Total	**67**		
Clover, pasture, multifloral or blend descriptions	**46**	**69%**	**30%**
Non-clover, pasture, multifloral or blend descriptions	**21**	**31%**	**14%**

5.2 2018/2019 GLYPHOSATE RESIDUE RESULTS

For honey being traded in international markets, there can be a consumer perception or trade risk associated with the presence of any residues. In the first half of 2019, 83% by volume and 92%[5] by value of honey traded internationally from New Zealand was either monofloral or multifloral mānuka honey. As a consequence, monofloral and multifloral mānuka honey was targeted for a follow up survey.

As in the 2017/2018 survey, none of the 60 retail packed samples contained glyphosate residues above the default maximum residue level specified in the Food Regulations. Eleven monofloral and multifloral samples (18.3%) contained glyphosate residues between the laboratory limit of reporting and the default maximum residue level specified in regulation.

5.3 OTHER AGRICULTURAL COMPOUND RESIDUE RESULTS

In 2017/2018 and 2018/2019, 89 raw extracted honey samples of a variety of floral types were tested for 474 agricultural compounds. None of the samples contained residues above the laboratory limit of reporting. This compliments historical monitoring results showing an absence of agricultural compound residues in New Zealand origin honey[6].

6 Interpretation of results

New Zealand Food Safety undertook a dietary intake assessment of all the results. This assessment concluded none of the glyphosate residues in honey had any food safety concerns.

As of October 2019, none of the 88 registered products[7] containing the active ingredient glyphosate have label claims for use directly on bees or in use in hives. The main use of glyphosate, since first registered in New Zealand in 1976, is as an herbicide for non-selective weed control in a variety of situations. It can also be used for pasture renovation and renewal.

Review of results did not show a connection between the presence of glyphosate residues and geographic locations of RMP premises. The locations of the RMP premises are corresponding to the physical addresses of honey extraction facilities where the samples were collected and may not relate to the location of apiaries or hives. Beekeepers can transport hives from a number of locations to the extraction facility.

[5] Statistics NZ Infoshare – Aggregated Harmonised Trade – Exports (Quarterly) 2019 Q1 and Q2 (1 January – 30 June).
[6] https://www.mpi.govt.nz/food-safety/food-monitoring-and-surveillance/monitoring-programmes-under-the-animal-products-act/national-chemical-residues-programme/documents-for-ncrp/
[7] https://eatsafe.nzfsa.govt.nz/web/public/acvm-register

In June 2018, there were 881,185 registered hives and 8,552 registered beekeeping enterprises across New Zealand[8]. The honey industry is characterised by a small number of large operators sourcing honey from tens of thousands of hives across New Zealand and a large number of small operators sourcing honey from less than 50 hives. Many of the small operators will contract the use of honey extraction facilities or sell un-extracted frames to larger operators. Because of this, RMP locations can only be used as a general indication of the region where the honey originated.

A more frequent occurrence with floral type was indicated by the results, with clover and pasture or Multifloral/blend honeys more likely to have glyphosate residues. Honeybees forage in a normal range of 3 km[9] around their hives, but have been recorded as travelling over 10 km[10]. These factors would indicate the most likely cause of glyphosate residues in honey is the inadvertent exposure of honeybees to glyphosate from its approved use in agriculture and on pastures.

None of the retail packed samples were found to contain residues of glyphosate above the default maximum residue level specified in the Food Regulations. This indicates the normal industry processing is mitigating the risk of residues above the default maximum residue level.

Five samples (less than 1.7%) of raw extracted (unblended or unprocessed) honey samples contained residues which could have been above regulatory levels if offered for sale.

New Zealand Food Safety undertook a dietary intake assessment of all the results. This review concluded none of the glyphosate residues in honey had any food safety concerns.

In 2016[11] and 2017[12] the European Food Safety Authority reported residues of glyphosate in honey present in Austria and Germany. Samples were described as domestic, or originating within the EU, and were collected at all levels of trade (import, wholesale, retail sale, and production). Without specific information to relate the presence of residues and where in the supply chain samples were taken, it is not clear whether the residue found related to retail or production honeys. The Germany competent authority offered '*Use of pesticide according to authorised GAP* [good agricultural practice]*: unexpected slow degradation of residues*'[13] and '*Bees collecting honey near applied fields*'[14] as reasons for MRL non-compliance. The incidence and levels of glyphosate residues in honey reported in Austria and Germany were comparable with the rates found in raw extracted (unblended or unprocessed) honey samples in this survey.

In 2019, researchers from the European Union Reference Laboratory for Pesticide Residues in Fruit & Vegetables, Spain reported residues of glyphosate in honey[15] present in Europe and South America. The study found residues present in 81% of samples tested and 41% of samples had residues above the European Union MRL. Other research institutes have also reported similar findings[16][17][18][19][20].

Maximum residue levels are established in the Food Notice: Maximum Residue Levels for Agricultural Compounds to demonstrate good agricultural practices in the use of agricultural compounds. Because

[8] 2018 MPI Apiculture Monitoring Programme Report
[9] https://en.wikipedia.org/wiki/Forage_(honey_bee)
[10] https://www.buzzaboutbees.net/how-far-do-bees-fly.html
[11] https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2018.5348
[12] https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2019.5743
[13] https://efsa.onlinelibrary.wiley.com/doi/10.2903/sp.efsa.2018.EN-1454
[14] https://efsa.onlinelibrary.wiley.com/doi/10.2903/sp.efsa.2019.EN-1666
[15] Pareja L, Jesús F, Heinzen H, Hernando MD, Rajski Ł, Fernández-Alba AR (2019) Evaluation of glyphosate and AMPA in honey by water extraction followed by ion chromatography. Analytical Methods, 11, 2123. https://doi.org/10.1039/c9ay00543a
[16] Chamkasem N, Vargo JD (2017) Development and Independent Laboratory Validation of an Analytical Method for the Direct Determination of Glyphosate, Glufosinate, and Aminomethylphosphonic Acid in Honey by Liquid Chromatography/Tandem Mass Spectrometry. Journal of Regulatory Science 5(2), 1–9. http://dx.doi.org/10.21423/jrs-v05n02p00
[17] Karise R, Raimets R, Bartkevics V, Pugajeva I, Pihlik P, Keres I, Williams IH, Viinalass H, Mand M (2017) Are pesticide residues in honey related to oilseed rape treatments? Chemosphere 188, 389-396. http://dx.doi.org/10.1016/j.chemosphere.2017.09.013
[18] Zoller O, Rhyn P, Rupp H, Zarn JA, Geiser C (2018) Glyphosate residues in Swiss market foods: monitoring and risk evaluation. Food Additives & Contaminants: Part B, 11(2), 83-91. https://doi.org/10.1080/19393210.2017.1419509
[19] 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
[20] Thompson TS, van den Heever JP, Limanowka RE (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. https://doi.org/10.1080/19440049.2019.1577993

the residues most likely result from unintended exposure of honeybees to glyphosate in the environment, good agricultural practice is not applicable.

Beekeepers also have little practical means of excluding bees from foraging on plants treated with glyphosate. To do so, would require the beekeeper to place their hives at the centre of 28 square kilometre area[21] where they had assurance from land owners and managers there was no agricultural compound use.

7 Conclusion

New Zealand Food Safety has tested samples across several years for agricultural compounds, including insecticides, fungicides, herbicides and environmental contaminants in honey.

After concerns raised by the honey industry New Zealand Food Safety conducted targeted surveys on honeys for glyphosate residues.

Tests showed the majority of samples contained no residues any agricultural compound above the laboratory limit of reporting. A small number of tests showed glyphosate residues below regulatory levels.

New Zealand Food Safety dietary exposure assessment found these not to be a food safety concern.

The results of these surveys are in line with other international reports and studies.

[21] https://www.biogro.co.nz/biogro-standards/

8 Appendix

8.1 SAMPLE AND RESULT SUMMARIES

Table: Summary of sample descriptions and number of samples tested in 2017/2018

RMP operator description or product label[22]	Number of each floral type included in survey	Percentage of each floral type v total number of samples in survey
Autumn harvest	1	0%
Bush	1	0%
Bush blend	16	5%
Bush blend/ Pohutukawa	1	0%
Clover	46	15%
Honeydew	16	5%
Honeydew beech	1	0%
Kamahi	5	2%
Kamahi/ Mānuka	1	0%
Kānuka	3	1%
Kānuka/ Bush	1	0%
Ling Heather	1	0%
Liquid	4	1%
Mānuka	98	33%
Manuka & Wildflower	1	0%
Mānuka blend	1	0%
Mānuka creamed	1	0%
Mānuka, 100+MGO	1	0%
Mānuka, UMF10+	2	1%
Mānuka, UMF2.5+	1	0%
Mānuka, UMF5+	2	1%
Mānuka, UMF6+	1	0%
Mānuka/ Clover	1	0%
Mānuka/ Kānuka	3	1%
Mānuka/ Wild floral blend	1	0%
Manuka/ Willowdew	1	0%
Multifloral	21	7%
Multifloral with Mānuka	1	0%
n/a	38	13%
Pasture	19	6%
Pohutukawa	1	0%
Rata	2	1%
Red beech	1	0%
Rewarewa	4	1%
Tawari	2	1%
Total	**300**	

[22] n/a means floral source not available

Table: 2017/2018 Summary of samples and results tested for glyphosate residues

Sample No.	Date sampled ("dd-mm-yyyy")	Floral source[23]	Sample type	Result (mg/kg)[24]
291164	21-01-2015	Clover	Raw extracted	0.015
291165	27-01-2015	Mānuka	Raw extracted	ND
291166	16-01-2015	Mānuka	Raw extracted	ND
291167	14-01-2015	Mānuka	Raw extracted	ND
291168	14-01-2015	Mānuka	Raw extracted	ND
291169	04-02-2015	Mānuka	Raw extracted	ND
291170	04-02-2015	Bush blend	Raw extracted	ND
291171	04-02-2015	Mānuka	Raw extracted	ND
291172	05-02-2015	Bush blend/ Pohutukawa	Raw extracted	0.011
291173	05-02-2015	Mānuka	Raw extracted	ND
291174	28-01-2015	Mānuka	Raw extracted	ND
291175	29-01-2015	Bush blend	Raw extracted	ND
291176	10-02-2015	Mānuka	Raw extracted	ND
291177	20-01-2015	n/a	Raw extracted	ND
291178	09-02-2015	Mānuka	Raw extracted	ND
291179	16-02-2015	Mānuka	Raw extracted	ND
291180	11-02-2015	Clover	Raw extracted	0.031
291181	30-01-2015	Mānuka	Raw extracted	ND
291182	19-02-2015	n/a	Raw extracted	0.01
291183	30-01-2015	Mānuka	Raw extracted	ND
291184	04-02-2015	Mānuka	Raw extracted	ND
291185	10-02-2015	Pasture	Raw extracted	ND
291186	10-02-2015	Mānuka	Raw extracted	0.058
291187	05-02-2015	Pasture	Raw extracted	ND
291188	16-02-2015	Pasture	Raw extracted	ND
291189	23-02-2015	Mānuka	Raw extracted	ND
291190	23-02-2015	Pasture	Raw extracted	ND
291191	24-02-2015	Clover	Raw extracted	ND
291192	02-03-2015	Multifloral	Raw extracted	ND
291193	04-03-2015	Mānuka	Raw extracted	ND
291194	02-03-2015	Mānuka	Raw extracted	ND
291195	11-03-2015	Pasture	Raw extracted	ND
291196	12-03-2015	n/a	Raw extracted	ND
291197	11-03-2015	Clover	Raw extracted	ND
291198	10-03-2015	n/a	Raw extracted	ND
291199	11-03-2015	Bush blend	Raw extracted	ND
291200	13-03-2015	Mānuka	Raw extracted	ND
291201	19-03-2015	Clover	Raw extracted	ND
291202	24-02-2015	Mānuka	Raw extracted	ND
291203	25-02-2015	Clover	Raw extracted	0.18
291204	26-02-2015	Mānuka	Raw extracted	0.04
291205	27-02-2015	Mānuka	Raw extracted	ND

[23] n/a means floral source not available
[24] ND means 'Not detected'

Sample No.	Date sampled ("dd-mm-yyyy")	Floral source[23]	Sample type	Result (mg/kg)[24]
291206	12-03-2015	Mānuka	Raw extracted	ND
291207	13-03-2015	Mānuka	Raw extracted	ND
291208	25-03-2015	n/a	Raw extracted	ND
291209	24-03-2015	Multifloral	Raw extracted	0.021
291210	10-04-2015	Mānuka	Raw extracted	0.023
291211	31-03-2015	Pasture	Raw extracted	ND
291212	30-03-2015	Mānuka	Raw extracted	ND
291213	31-03-2015	Mānuka	Raw extracted	ND
291214	31-03-2015	Mānuka	Raw extracted	ND
291215	30-03-2015	Mānuka	Raw extracted	ND
291216	08-04-2015	Clover	Raw extracted	0.1
291217	01-04-2015	Mānuka/ Kānuka	Raw extracted	ND
291218	16-04-2015	Mānuka	Raw extracted	ND
291219	14-04-2015	Honeydew	Raw extracted	ND
291220	01-04-2015	Kamahi/ Mānuka	Raw extracted	ND
291221	30-03-2015	Kānuka	Raw extracted	ND
291222	14-04-2015	Mānuka	Raw extracted	ND
291223	08-04-2015	Pasture	Raw extracted	ND
291224	26-03-2015	n/a	Raw extracted	ND
291225	24-03-2015	n/a	Raw extracted	ND
291226	30-03-2015	Kānuka	Raw extracted	0.018
291227	24-03-2015	n/a	Raw extracted	ND
291228	31-03-2015	n/a	Raw extracted	0.024
291229	09-04-2015	n/a	Raw extracted	ND
291230	10-04-2015	n/a	Raw extracted	ND
291231	08-04-2015	n/a	Raw extracted	ND
291232	19-03-2015	n/a	Raw extracted	0.014
291233	17-03-2015	Mānuka	Raw extracted	ND
291234	31-03-2015	Mānuka	Raw extracted	ND
291235	01-04-2015	Mānuka	Raw extracted	ND
291236	01-04-2015	Mānuka	Raw extracted	ND
291237	14-04-2015	Clover	Raw extracted	ND
291238	13-04-2015	n/a	Raw extracted	ND
291239	21-04-2015	Mānuka	Raw extracted	ND
291240	23-04-2015	Clover	Raw extracted	ND
291241	30-04-2015	Mānuka/ Kānuka	Raw extracted	ND
291242	29-04-2015	Mānuka	Raw extracted	ND
291243	28-04-2015	Rata	Raw extracted	ND
291244	18-03-2015	n/a	Raw extracted	ND
291245	12-03-2015	n/a	Raw extracted	ND
291246	30-04-2015	Mānuka	Raw extracted	ND
291247	29-04-2015	Multifloral	Raw extracted	0.049
291248	30-04-2015	Mānuka	Raw extracted	ND
291249	05-05-2015	Mānuka	Raw extracted	ND

Sample No.	Date sampled ("dd-mm-yyyy")	Floral source[23]	Sample type	Result (mg/kg)[24]
291250	30-04-2015	n/a	Raw extracted	ND
291251	04-05-2015	Pasture	Raw extracted	ND
291252	08-05-2015	Bush blend	Raw extracted	ND
291253	15-05-2015	Autumn harvest	Raw extracted	ND
291254	01-05-2015	n/a	Raw extracted	ND
291255	26-05-2015	Mānuka/ Kānuka	Raw extracted	ND
291256	24-03-2015	Pasture	Raw extracted	ND
291257	02-06-2015	Pasture	Raw extracted	ND
291258	29-01-2015	Mānuka	Raw extracted	ND
291259	12-03-2015	Mānuka	Raw extracted	ND
291260	27-05-2015	Multifloral	Raw extracted	ND
291261	14-05-2015	Kamahi	Raw extracted	ND
291262	23-02-2015	Multifloral	Raw extracted	ND
291263	05-06-2015	Honeydew	Raw extracted	ND
291264	24-04-2015	Honeydew	Raw extracted	ND
291265	02-06-2015	Honeydew	Raw extracted	ND
291266	09-06-2015	Ling Heather	Raw extracted	ND
291267	17-02-2015	Mānuka	Raw extracted	ND
291268	13-04-2015	Bush blend	Raw extracted	ND
291269	27-05-2015	Honeydew	Raw extracted	ND
291270	13-01-2015	Kamahi	Raw extracted	ND
291271	20-05-2015	Bush blend	Raw extracted	ND
291272	30-03-2015	Mānuka	Raw extracted	ND
291273	19-02-2015	Clover	Raw extracted	ND
291274	19-02-2015	Clover	Raw extracted	ND
291275	20-02-2015	Kamahi	Raw extracted	ND
291276	09-03-2015	Clover	Raw extracted	ND
291277	10-03-2015	Clover	Raw extracted	ND
291278	13-03-2015	Clover	Raw extracted	0.024
291279	14-04-2015	Clover	Raw extracted	ND
291280	30-04-2015	Clover	Raw extracted	ND
291281	08-06-2015	Clover	Raw extracted	ND
291282	09-04-2015	Mānuka	Raw extracted	ND
291283	18-06-2015	Honeydew	Raw extracted	ND
291284	18-06-2015	Mānuka	Raw extracted	ND
291285	18-06-2015	Pasture	Raw extracted	ND
291286	17-06-2015	Clover	Raw extracted	0.092
291287	28-05-2015	n/a	Raw extracted	ND
291288	19-06-2015	n/a	Raw extracted	ND
291289	27-06-2015	Clover	Raw extracted	ND
291290	12-01-2016	Mānuka	Raw extracted	ND
291291	11-01-2016	Mānuka	Raw extracted	ND
291292	11-01-2016	Mānuka	Raw extracted	ND
291293	22-01-2016	Tawari	Raw extracted	ND

Sample No.	Date sampled ("dd-mm-yyyy")	Floral source[23]	Sample type	Result (mg/kg)[24]
291294	28-01-2016	n/a	Raw extracted	ND
291295	09-02-2016	n/a	Raw extracted	ND
291296	09-02-2016	n/a	Raw extracted	ND
291297	26-01-2016	Bush blend	Raw extracted	ND
291298	16-02-2016	Mānuka	Raw extracted	0.016
291299	02-02-2016	Mānuka	Raw extracted	ND
291300	02-02-2016	Mānuka	Raw extracted	ND
291301	12-02-2016	Bush blend	Raw extracted	0.018
291302	22-02-2016	Multifloral	Raw extracted	ND
291303	17-02-2016	n/a	Raw extracted	ND
291304	12-02-2016	n/a	Raw extracted	ND
291305	15-02-2016	n/a	Raw extracted	ND
291306	15-02-2016	n/a	Raw extracted	ND
291307	16-02-2016	n/a	Raw extracted	ND
291308	25-02-2016	Bush blend	Raw extracted	ND
291309	01-03-2016	Mānuka	Raw extracted	ND
291310	26-02-2016	Mānuka	Raw extracted	ND
291311	26-02-2016	Mānuka	Raw extracted	0.014
291312	24-02-2016	Multifloral	Raw extracted	ND
291313	17-02-2016	Mānuka	Raw extracted	0.018
291314	18-02-2016	Mānuka	Raw extracted	ND
291315	24-02-2016	Multifloral	Raw extracted	0.027
291316	18-02-2016	Kamahi	Raw extracted	ND
291317	17-02-2016	Kamahi	Raw extracted	ND
291318	22-02-2016	Clover	Raw extracted	ND
291319	02-03-2016	Clover	Raw extracted	ND
291320	02-03-2016	Clover	Raw extracted	0.012
291321	03-03-2016	Mānuka	Raw extracted	ND
291322	25-02-2016	Mānuka	Raw extracted	ND
291323	07-03-2016	Mānuka/ Willowdew	Raw extracted	ND
291324	07-03-2016	Mānuka	Raw extracted	ND
291325	08-03-2016	Multifloral	Raw extracted	0.015
291326	03-03-2016	n/a	Raw extracted	ND
291327	11-03-2016	Mānuka	Raw extracted	ND
291328	17-02-2016	Mānuka	Raw extracted	0.073
291329	08-03-2016	Mānuka	Raw extracted	ND
291330	08-03-2016	n/a	Raw extracted	ND
291331	10-03-2016	Mānuka	Raw extracted	ND
291332	16-03-2016	n/a	Raw extracted	ND
291333	16-03-2016	Clover	Raw extracted	0.051
291334	14-03-2016	Kānuka/ Bush	Raw extracted	0.013
291335	14-03-2016	Mānuka	Raw extracted	0.025
291336	14-03-2016	Kānuka	Raw extracted	ND
291337	14-03-2016	Mānuka/ Clover	Raw extracted	0.04

Sample No.	Date sampled ("dd-mm-yyyy")	Floral source[23]	Sample type	Result (mg/kg)[24]
291338	22-03-2016	Honeydew	Raw extracted	ND
291339	24-03-2016	Rewarewa	Raw extracted	ND
291340	24-03-2016	Honeydew	Raw extracted	ND
291341	31-03-2016	Mānuka	Raw extracted	ND
291342	16-03-2016	Mānuka	Raw extracted	ND
291343	18-03-2016	Rewarewa	Raw extracted	ND
291344	17-03-2016	Rewarewa	Raw extracted	ND
291345	15-03-2016	Mānuka	Raw extracted	ND
291346	14-03-2016	Mānuka	Raw extracted	ND
291347	02-03-2016	Mānuka	Raw extracted	ND
291348	05-04-2016	Pasture	Raw extracted	0.022
291349	28-03-2016	Mānuka	Raw extracted	ND
291350	23-03-2016	Clover	Raw extracted	0.044
291351	14-04-2016	Honeydew	Raw extracted	ND
291352	14-04-2016	Pasture	Raw extracted	ND
291353	15-04-2016	Honeydew	Raw extracted	ND
291354	15-04-2016	Pasture	Raw extracted	ND
291355	14-04-2016	Mānuka	Raw extracted	ND
291356	15-04-2016	Mānuka	Raw extracted	ND
291357	11-04-2016	Mānuka	Raw extracted	0.014
291358	11-04-2016	Mānuka	Raw extracted	0.037
291359	11-04-2016	Mānuka	Raw extracted	0.062
291360	11-04-2016	Mānuka	Raw extracted	0.042
291361	29-03-2016	Pasture	Raw extracted	1.1
291362	30-03-2016	Bush blend	Raw extracted	0.017
291363	28-04-2016	Mānuka	Raw extracted	0.012
291364	28-04-2016	Mānuka	Raw extracted	0.063
291365	27-04-2016	Mānuka	Raw extracted	ND
291366	29-04-2016	Honeydew	Raw extracted	0.012
291367	03-05-2016	Pasture	Raw extracted	ND
291368	06-05-2016	Mānuka	Raw extracted	ND
291369	22-04-2016	Pasture	Raw extracted	0.6
291370	03-05-2016	Bush blend	Raw extracted	ND
291371	10-05-2016	Clover	Raw extracted	0.01
291372	18-05-2016	Multifloral	Raw extracted	0.011
291373	17-05-2016	Mānuka	Raw extracted	0.016
291374	19-05-2016	Multifloral	Raw extracted	ND
291375	16-05-2016	Mānuka	Raw extracted	ND
291376	18-05-2016	Mānuka	Raw extracted	ND
291377	19-05-2016	Honeydew	Raw extracted	ND
291378	05-05-2016	Mānuka	Raw extracted	ND
291379	09-03-2016	Bush blend	Raw extracted	ND
291380	12-05-2016	Clover	Raw extracted	0.024
291381	16-05-2016	Honeydew	Raw extracted	ND

Sample No.	Date sampled ("dd-mm-yyyy")	Floral source[23]	Sample type	Result (mg/kg)[24]
291382	31-05-2016	Multifloral	Raw extracted	ND
291383	30-03-2016	Multifloral	Raw extracted	ND
291384	03-02-2016	Mānuka	Raw extracted	ND
291385	28-04-2016	Pasture	Raw extracted	0.012
291386	01-06-2016	Bush blend	Raw extracted	ND
291387	14-06-2016	Clover	Raw extracted	0.016
291388	15-06-2016	n/a	Raw extracted	ND
291389	18-03-2016	n/a	Raw extracted	0.029
291390	25-02-2016	n/a	Raw extracted	ND
291391	15-03-2016	n/a	Raw extracted	ND
291392	16-03-2016	n/a	Raw extracted	ND
291393	17-03-2016	n/a	Raw extracted	ND
291394	12-05-2016	Clover	Raw extracted	ND
291395	23-03-2016	Multifloral	Raw extracted	ND
291396	23-03-2016	Multifloral	Raw extracted	0.038
291397	15-03-2016	Clover	Raw extracted	ND
291398	18-02-2016	Clover	Raw extracted	0.026
291399	18-05-2016	Clover	Raw extracted	0.012
291400	22-03-2016	Clover	Raw extracted	0.036
291401	16-03-2016	Multifloral	Raw extracted	ND
291402	09-05-2016	Clover	Raw extracted	ND
291403	13-05-2016	Clover	Raw extracted	ND
291404	03-06-2016	Clover	Raw extracted	0.025
291405	29-03-2016	Mānuka	Raw extracted	ND
291406	27-06-2016	Pasture	Raw extracted	ND
291407	27-06-2016	clover	Raw extracted	0.13
291408	12-04-2016	Mānuka	Raw extracted	ND
291409	27-06-2016	Clover	Raw extracted	0.16
291410	27-06-2016	Honeydew	Raw extracted	ND
291411	03-03-2016	n/a	Raw extracted	ND
291412	28-06-2016	Bush blend	Raw extracted	ND
291413	28-06-2016	Mānuka	Raw extracted	ND
291414	29-06-2016	Honeydew	Raw extracted	ND
291415	28-06-2016	Honeydew	Raw extracted	ND
291416	01-03-2016	Clover	Raw extracted	ND
291417	31-03-2016	Clover	Raw extracted	0.03
291418	27-06-2016	Mānuka	Raw extracted	ND
291419	27-06-2016	Mānuka	Raw extracted	ND
291420	29-06-2016	Mānuka	Raw extracted	ND
291421	27-06-2016	Rewarewa	Raw extracted	ND
291422	29-06-2016	Mānuka	Raw extracted	ND
291423	15-03-2016	Bush blend	Raw extracted	ND
291424	29-06-2016	Mānuka	Raw extracted	ND
291425	30-06-2016	Mulitfloral	Raw extracted	0.085

Sample No.	Date sampled ("dd-mm-yyyy")	Floral source[23]	Sample type	Result (mg/kg)[24]
291426	14-04-2016	Clover	Raw extracted	ND
291427	11-04-2016	Multifloral	Raw extracted	0.1
291428	29-06-2016	Multifloral	Raw extracted	ND
291429	30-06-2016	Bush Blend	Raw extracted	ND
291430	30-06-2016	Mānuka	Raw extracted	ND
291431	18-04-2016	Multifloral	Raw extracted	ND
291432	09-02-2016	Multifloral	Raw extracted	ND
291433	01-07-2016	Mānuka	Raw extracted	0.1
291434	26-07-2016	Bush	Retail packed	0.016
291435	26-07-2016	Cover creamed	Retail packed	0.02
291436	26-07-2016	Clover floral	Retail packed	ND
291437	26-07-2016	Liquid	Retail packed	0.013
291438	26-07-2016	Mānuka creamed	Retail packed	0.01
291439	26-07-2016	Liquid	Retail packed	0.025
291440	26-07-2016	Mānuka & wildflower	Retail packed	ND
291441	26-07-2016	Clover blend	Retail packed	0.017
291442	26-07-2016	Liquid	Retail packed	ND
291443	26-07-2016	Mānuka	Retail packed	ND
291444	26-07-2016	Mānuka, UMF10+	Retail packed	ND
291445	26-07-2016	Mānuka, UMF5+	Retail packed	ND
291446	26-07-2016	Multifloral with Mānuka	Retail packed	ND
291447	26-07-2016	Mānuka, UMF6+	Retail packed	ND
291448	26-07-2016	Clover blend	Retail packed	0.012
291449	26-07-2016	Liquid	Retail packed	ND
291450	26-07-2016	Mānuka blend	Retail packed	0.014
291451	26-07-2016	Mānuka, UMF10+	Retail packed	ND
291452	26-07-2016	Mānuka, UMF5+	Retail packed	ND
291453	26-07-2016	Mānuka/ Wild floral blend	Retail packed	ND
291454	27-07-2016	Red Beech	Retail packed	ND
291455	27-07-2016	Rata	Retail packed	ND
291456	27-07-2016	Pohutukawa	Retail packed	0.01
291457	27-07-2016	Tawari	Retail packed	ND
291458	27-07-2016	Mānuka, UMF2.5+	Retail packed	ND
291459	27-07-2016	Mānuka	Retail packed	ND
291460	28-07-2016	Clover white	Retail packed	ND
291461	28-07-2016	Clover creamed	Retail packed	ND
291462	28-07-2016	Honeydew beech	Retail packed	ND
291463	28-07-2016	Mānuka, 100+MGO	Retail packed	ND

Table: 2018/2019 Summary of samples and results tested for glyphosate residues

Sample No.	Date sampled ("dd-mm-yyyy")	Floral source	Sample type	Result (mg/kg)[25]
2214839-2	21/05/2019	Monofloral mānuka	Retail packed	ND
2214839-4	21/05/2019	Monofloral mānuka	Retail packed	ND
2214839-5	21/05/2019	Monofloral mānuka	Retail packed	ND
2214839-6	21/05/2019	Monofloral mānuka	Retail packed	ND
2214839-8	21/05/2019	Monofloral mānuka	Retail packed	ND
2214839-9	21/05/2019	Monofloral mānuka	Retail packed	ND
2214839-11	17/05/2019	Monofloral mānuka	Retail packed	ND
2214839-12	17/05/2019	Monofloral mānuka	Retail packed	ND
2214839-13	17/05/2019	Monofloral mānuka	Retail packed	ND
2214839-15	17/05/2019	Monofloral mānuka	Retail packed	ND
2214839-16	31/05/2019	Monofloral mānuka	Retail packed	ND
2214839-18	21/05/2019	Monofloral mānuka	Retail packed	ND
2214839-20	21/05/2019	Monofloral mānuka	Retail packed	ND
2214839-26	21/05/2019	Monofloral mānuka	Retail packed	ND
2214839-29	21/05/2019	Monofloral mānuka	Retail packed	ND
2214839-30	21/05/2019	Monofloral mānuka	Retail packed	ND
2214839-32	21/05/2019	Monofloral mānuka	Retail packed	ND
2214839-33	21/05/2019	Monofloral mānuka	Retail packed	ND
2214839-36	17/05/2019	Monofloral mānuka	Retail packed	0.012
2214839-37	17/05/2019	Monofloral mānuka	Retail packed	ND
2214839-38	17/05/2019	Multifloral mānuka	Retail packed	ND
2214839-39	17/05/2019	Multifloral mānuka	Retail packed	0.015
2214839-42	21/05/2019	Monofloral mānuka	Retail packed	ND
2214839-43	31/05/2019	Monofloral mānuka	Retail packed	ND
2214839-44	17/05/2019	Monofloral mānuka	Retail packed	ND
2214839-45	31/05/2019	Multifloral mānuka	Retail packed	0.011
2214839-48	24/06/2019	Monofloral mānuka	Retail packed	ND
2214839-49	31/05/2019	Monofloral mānuka	Retail packed	ND
2214839-50	17/05/2019	Monofloral mānuka	Retail packed	ND
2214839-52	21/05/2019	Monofloral mānuka	Retail packed	ND
2214839-53	28/06/2019	Monofloral mānuka	Retail packed	0.028
2216133-1	17/05/2019	Monofloral mānuka	Retail packed	0.012
2216133-3	17/05/2019	Monofloral mānuka	Retail packed	ND
2216133-6	17/05/2019	Monofloral mānuka	Retail packed	ND
2216133-11	17/05/2019	Monofloral mānuka	Retail packed	0.016
2216133-12	31/05/2019	Monofloral mānuka	Retail packed	ND
2216133-13	31/05/2019	Monofloral mānuka	Retail packed	0.014
2216133-14	31/05/2019	Monofloral mānuka	Retail packed	ND
2216133-21	17/05/2019	Monofloral mānuka	Retail packed	0.026
2216133-22	17/05/2019	Monofloral mānuka	Retail packed	ND
2216133-24	31/05/2019	Monofloral mānuka	Retail packed	ND
2216133-25	31/05/2019	Monofloral mānuka	Retail packed	ND

[25] ND means 'Not detected'

Sample No.	Date sampled ("dd-mm-yyyy")	Floral source	Sample type	Result (mg/kg)[25]
2216133-27	31/05/2019	Monofloral mānuka	Retail packed	ND
2216133-28	31/05/2019	Monofloral mānuka	Retail packed	ND
2216133-30	31/05/2019	Monofloral mānuka	Retail packed	ND
2216133-31	17/05/2019	Monofloral mānuka	Retail packed	ND
2216133-33	22/05/2019	Monofloral mānuka	Retail packed	ND
2216133-35	23/05/2019	Monofloral mānuka	Retail packed	0.013
2216133-36	17/05/2019	Monofloral mānuka	Retail packed	ND
2216133-39	17/05/2019	Monofloral mānuka	Retail packed	0.013
2216133-41	22/05/2019	Monofloral mānuka	Retail packed	ND
2216133-42	17/05/2019	Monofloral mānuka	Retail packed	ND
2216133-43	22/05/2019	Monofloral mānuka	Retail packed	ND
2216133-45	22/05/2019	Monofloral mānuka	Retail packed	ND
2216133-51	22/05/2019	Monofloral mānuka	Retail packed	ND
2216133-53	31/05/2019	Monofloral mānuka	Retail packed	ND
2216133-54	31/05/2019	Monofloral mānuka	Retail packed	ND
2216133-56	31/05/2019	Monofloral mānuka	Retail packed	ND
2216133-58	31/05/2019	Monofloral mānuka	Retail packed	0.088
2216133-59	22/05/2019	Monofloral mānuka	Retail packed	ND

Table: 2017/2018 Summary of samples and results tested for 474 agricultural compound (not including glyphosate)

Sample No.	Date sampled ("dd-mm-yyyy")	Floral source	Sample type	Result (mg/kg)[26]
435554	17/01/2018	n/a	Raw extracted	ND
437505	05/02/2018	Clover Borage	Raw extracted	ND
437773	12/02/2018	Mānuka	Raw extracted	ND
438061	16/02/2018	Mānuka	Raw extracted	ND
438077	05/03/2018	Rewarewa	Raw extracted	ND
440166	20/03/2018	Pasture	Raw extracted	ND
440167	21/03/2018	Pasture/ Bush	Raw extracted	ND
440223	28/03/2018	Rata	Raw extracted	ND
440813	11/04/2018	Mānuka blend	Raw extracted	ND
440814	11/04/2018	Multiflora	Raw extracted	ND
440930	20/04/2018	Mānuka	Raw extracted	ND
441072	27/03/2018	Clover	Raw extracted	ND
441399	04/05/2018	n/a	Raw extracted	ND
441416	07/03/2018	n/a	Raw extracted	ND
441485	22/02/2018	Mānuka	Raw extracted	ND
441588	23/04/2018	Mānuka	Raw extracted	ND
442048	26/03/2018	Mānuka	Raw extracted	ND
442134	11/04/2018	Honeydew	Raw extracted	ND
442225	04/06/2018	Honeydew	Raw extracted	ND
443381	17/03/2018	Bush blend	Raw extracted	ND
443399	09/05/2018	Clover	Raw extracted	ND

[26] ND means 'Not detected'

Sample No.	Date sampled ("dd-mm-yyyy")	Floral source	Sample type	Result (mg/kg)[26]
443489	23/04/2018	Clover	Raw extracted	ND

Table: 2018/2019 Summary of samples and results tested for 474 agricultural compound (not including glyphosate)

Sample No.	Date sampled ("dd-mm-yyyy")	Floral source	Sample type	Result (mg/kg)[27]
450360	14/01/2019	Kamahi	Raw extracted	ND
450378	16/01/2019	Multifloral	Raw extracted	ND
450482	23/01/2019	Rewarewa	Raw extracted	ND
450533	28/01/2019	Bush blend	Raw extracted	ND
450658	21/01/2019	Multifloral	Raw extracted	ND
450659	01/02/2019	Multifloral	Raw extracted	ND
450812	05/02/2019	Mānuka	Raw extracted	ND
450814	07/02/2019	Mānuka	Raw extracted	ND
450815	08/02/2019	Mānuka	Raw extracted	ND
450872	11/02/2019	Kānuka blend	Raw extracted	ND
451966	11/02/2019	Multifloral	Raw extracted	ND
452000	20/02/2019	Bush	Raw extracted	ND
452008	20/02/2019	Multifloral	Raw extracted	ND
452014	21/02/2019	Mānuka/ Bush blend	Raw extracted	ND
452047	21/02/2019	Multifloral	Raw extracted	ND
452094	15/02/2019	Mānuka	Raw extracted	ND
452130	26/02/2019	Mānuka	Raw extracted	ND
452141	26/02/2019	Clover	Raw extracted	ND
452142	25/02/2019	Mānuka	Raw extracted	ND
452145	01/03/2019	Bush	Raw extracted	ND
452186	21/02/2019	Multifloral	Raw extracted	ND
452216	05/03/2019	Clover	Raw extracted	ND
452253	06/03/2019	Bush	Raw extracted	ND
452254	21/02/2019	Bush	Raw extracted	ND
452342	12/01/2019	Bush blend	Raw extracted	ND
452361	08/03/2019	Clover	Raw extracted	ND
452385	13/03/2019	Bush/ Pasture blend	Raw extracted	ND
452436	12/03/2019	Multifloral	Raw extracted	ND
452437	14/03/2019	Clover	Raw extracted	ND
452517	11/03/2019	Mānuka/ Kānuka blend	Raw extracted	ND
452574	20/03/2019	Multifloral/ Mānuka blend	Raw extracted	ND
452760	26/03/2019	Multifloral/ Mānuka blend	Raw extracted	ND
452765	26/03/2019	Mānuka	Raw extracted	ND
452805	08/03/2019	Multifloral	Raw extracted	ND
452923	05/04/2019	Bush	Raw extracted	ND
452966	04/04/2019	Clover	Raw extracted	ND
452967	01/04/2019	Bush	Raw extracted	ND
452968	01/04/2019	Honeydew	Raw extracted	ND

[27] ND means 'Not detected'

Sample No.	Date sampled ("dd-mm-yyyy")	Floral source	Sample type	Result (mg/kg)[27]
452969	02/04/2019	Multifloral	Raw extracted	ND
452987	12/03/2019	Mānuka	Raw extracted	ND
452990	03/04/2019	Mānuka	Raw extracted	ND
452991	04/04/2019	Mānuka	Raw extracted	ND
453024	10/04/2019	Honeydew	Raw extracted	ND
453050	25/03/2019	Multifloral	Raw extracted	ND
453053	09/04/2019	Multifloral	Raw extracted	ND
453067	11/04/2019	Mānuka	Raw extracted	ND
453089	03/04/2019	Pasture	Raw extracted	ND
453135	14/03/2019	Clover	Raw extracted	ND
453398	09/05/2019	Bush	Raw extracted	ND
453404	02/05/2019	Multifloral	Raw extracted	ND
453508	10/05/2019	Bush blend	Raw extracted	ND
453589	15/05/2019	Clover	Raw extracted	ND
453745	29/03/2019	Clover	Raw extracted	ND
453809	29/05/2019	Pasture	Raw extracted	ND
453861	15/04/2019	Pasture	Raw extracted	ND
453864	08/01/2019	Mānuka	Raw extracted	ND
453876	31/05/2019	Clover	Raw extracted	ND
453877	30/05/2019	Mānuka	Raw extracted	ND
453926	06/06/2019	Pasture	Raw extracted	ND
453938	28/05/2019	Kamahi	Raw extracted	ND
453939	28/05/2019	Mānuka	Raw extracted	ND
454099	24/06/2019	Bush/ Pasture blend	Raw extracted	ND
454130	28/05/2019	Bush	Raw extracted	ND
454139	20/02/2019	Kamahi	Raw extracted	ND
454173	24/06/2019	Bush	Raw extracted	ND
454188	28/02/2019	Mānuka	Raw extracted	ND
454189	08/01/2019	Kamahi	Raw extracted	ND

8.2 LABORATORY LIMITS OF REPORTING (LOR)

Table: Carbamate insecticides

Agricultural compound	LOR (mg/kg)	Agricultural compound	LOR (mg/kg)	Agricultural compound	LOR (mg/kg)
Aldicarb	0.01	Ethiofencarb	0.01	Methiocarb-sulfoxide	0.01
Aldicarb-sulfone	0.01	Fenothiocarb	0.01	Methomyl	0.01
Aldicarb-sulfoxide	0.01	Fenoxycarb	0.01	Oxamyl	0.01
Bendiocarb	0.01	Furathiocarb	0.01	Pirimicarb	0.01
Carbaryl	0.01	Isoprocarb	0.01	Promecarb	0.01
Carbofuran	0.01	Methiocarb	0.01	Propamocarb	0.01
Diethofencarb	0.01	Methiocarb-sulfone	0.01	Propoxur	0.01

Table: Neonicotinoid insecticides

Agricultural compound	LOR (mg/kg)	Agricultural compound	LOR (mg/kg)	Agricultural compound	LOR (mg/kg)
Acetamiprid	0.01	Imidacloprid	0.01	Thiamethoxam	0.01

Acetamiprid-N-desmethyl	0.01	Imidacloprid-olefin	0.01		
Clothianidin	0.01	Thiacloprid	0.01		

Table: Organophosphate insecticides

Agricultural compound	LOR (mg/kg)	Agricultural compound	LOR (mg/kg)	Agricultural compound	LOR (mg/kg)
Acephate	0.01	Fenamiphos	0.01	Parathion	0.01
Azamethiphos	0.01	Fenamiphos-sulfone	0.01	Parathion-methyl	0.01
Azinphos-methyl	0.01	Fenamiphos-sulfoxide	0.01	Phenthoate	0.01
Bromophos	0.01	Fenchlorphos	0.01	Phorate	0.01
Bromophos-ethyl	0.01	Fenitrothion	0.01	Phorate-sulfone	0.01
Cadusafos	0.01	Fensulfothion	0.01	Phorate-sulfoxide	0.01
Chlorfenvinphos	0.01	Fenthion	0.01	Phosalone	0.01
Chlorpyrifos	0.01	Fenthion-ethyl	0.01	Phosmet	0.01
Chlorpyrifos-methyl	0.01	Fenthion-oxon	0.01	Phosphamidon	0.01
Chlorthiophos	0.01	Fenthion-oxon-sulfone	0.01	Phoxim	0.01
Coumaphos	0.01	Fenthion-oxon-sulfoxide	0.01	Piperophos	0.01
Coumaphos-oxon	0.01	Fenthion-sulfone	0.01	Pirimiphos-methyl	0.01
Cyanophos	0.01	Fenthion-sulfoxide	0.01	Profenofos	0.01
Demeton-S-methyl	0.01	Fonofos	0.01	Propaphos	0.01
Demeton-S-methyl-sulfoxide	0.01	Fosthiazate	0.01	Propetamphos	0.01
Diazinon	0.01	Heptenophos	0.01	Prothiofos	0.01
Dichlofenthion	0.01	Iodofenphos	0.01	Pyrazophos	0.01
Dichlorvos	0.01	Isazofos	0.01	Pyridaphenthion	0.01
Dicrotophos	0.01	Isofenphos	0.01	Quinalphos	0.01
Dimethoate	0.01	Isofenphos-methyl	0.01	Sulprofos	0.01
Dimethylvinphos	0.01	Isoxathion	0.01	Temephos	0.01
Dioxabenzofos	0.01	Leptophos	0.01	Terbufos	0.01
Disulfoton	0.01	Malathion	0.01	Terbufos-sulfone	0.01
Edifenphos	0.01	Methacrifos	0.01	Terbufos-sulfoxide	0.01
EPN	0.01	Methamidophos	0.01	Tetrachlorvinphos	0.01
Ethion	0.01	Methidathion	0.01	Thiometon	0.01
Ethoprophos	0.01	Mevinphos	0.01	Triazophos	0.01
Etrimfos	0.01	Monocrotophos	0.01	Vamidothion	0.01
Famphur	0.01	Omethoate	0.01		

Table: Pyrethroid insecticides

Agricultural compound	LOR (mg/kg)	Agricultural compound	LOR (mg/kg)	Agricultural compound	LOR (mg/kg)
Acrinathrin	0.01	Deltamethrin	0.01	Permethrin	0.01
Bifenthrin	0.01	Fenpropathrin	0.01	Phenothrin	0.01
Bioresmethrin	0.01	Fenvalerate	0.01	Pyrethrins	0.01
Cyfluthrin	0.01	Flucythrinate	0.01	Tefluthrin	0.01
Cyhalothrin	0.01	Flumethrin	0.01	Transfluthrin	0.01
Cypermethrin	0.01	Fluvalinate	0.01		

Table: Other insecticides

Agricultural compound	LOR (mg/kg)	Agricultural compound	LOR (mg/kg)	Agricultural compound	LOR (mg/kg)
Bromopropylate	0.01	Fipronil-sulfide	0.01	Pyrimidifen	0.01
Buprofezin	0.01	Fipronil-sulfone	0.01	Pyriproxyfen	0.01
Chlorantraniliprole	0.01	Fluacrypyrim	0.01	Spinetoram	0.01
Chlorfenapyr	0.01	Flubendazole	0.01	Spinosad	0.01
Chlorobenzilate	0.01	Flubendiamide	0.01	Spiromesifen	0.05

Chromafenozide	0.01	Formetanate hydrochloride	0.01	Spirotetramat	0.01
Clofentezine	0.01	Hexaflumuron	0.01	Spirotetramat-enol	0.01
Cyantraniliprole	0.01	Hexythiazox	0.01	Spirotetramat-enol-glucoside	0.01
Cyromazine	0.01	Indoxacarb	0.01	Spirotetramat-keto-hydroxy	0.01
Dicyclanil	0.01	Lufenuron	0.05	Spirotetramat-mono-hydroxy	0.01
Diflubenzuron	0.01	Methoxyfenozide	0.01	Sulfoxaflor	0.01
Emamectin benzoate	0.01	Milbemycin A3	0.01	Tebufenozide	0.01
Ethiprole	0.01	Milbemycin A4	0.01	Tebufenpyrad	0.01
Etoxazole	0.01	Nicotine	0.01	Teflubenzuron	0.01
Fenobucarb	0.01	Novaluron	0.01	Tetradifon	0.01
Fenpyroximate	0.01	Propargite	0.01	Thiabendazole	0.01
Fipronil	0.01	Pyraclofos	0.01	Triflumuron	0.01
Fipronil desulfinyl	0.01	Pyridaben	0.01		

Table: Fungicides

Agricultural compound	LOR (mg/kg)	Agricultural compound	LOR (mg/kg)	Agricultural compound	LOR (mg/kg)
2-Phenylphenol	0.01	Fenpyrazamine	0.01	Oxadixyl	0.01
Ametoctradin	0.01	Ferimzone	0.01	Oxathiapiprolin	0.01
Azaconazole	0.01	Fluazinam	0.01	Oxycarboxin	0.01
Azoxystrobin	0.01	Fludioxonil	0.01	Penconazole	0.01
Benalaxyl	0.01	Fluopicolide	0.01	Pencycuron	0.01
Benodanil	0.01	Fluopyram	0.01	Penthiopyrad	0.01
Bitertanol	0.01	Fluoxastrobin	0.01	Picoxystrobin	0.01
Bixafen	0.01	Fluquinconazole	0.01	Prochloraz	0.01
Boscalid	0.01	Flusilazole	0.01	Procymidone	0.01
Bupirimate	0.01	Flutolanil	0.01	Propiconazole	0.01
Captan	0.05	Flutriafol	0.01	Proquinazid	0.01
Carbendazim	0.01	Fluxapyroxad	0.01	Pyraclostrobin	0.01
Carboxin	0.01	Folpet	0.05	Pyrifenox	0.01
Carpropamid	0.01	Fuberidazole	0.01	Pyrimethanil	0.01
Chlorothalonil	0.01	Furalaxyl	0.01	Pyroquilon	0.01
Chlozolinate	0.01	Furametpyr	0.01	Quinoxyfen	0.01
Cyflufenamid	0.01	Hexaconazole	0.01	Quintozene	0.01
Cymoxanil	0.05	Imazalil	0.01	Simeconazole	0.01
Cyproconazole	0.01	Ipconazole	0.01	Spiroxamine	0.01
Cyprodinil	0.01	Iprobenfos	0.01	Tebuconazole	0.01
Diclobutrazol	0.01	Iprodione	0.01	Tecnazene	0.01
Diclocymet	0.01	Iprovalicarb	0.01	Tetraconazole	0.01
Difenoconazole	0.01	Isoprothiolane	0.01	Tiadinil	0.01
Dimethomorph	0.01	Isopyrazam	0.01	Tolclofos-methyl	0.01
Diphenylamine	0.01	Kresoxim-methyl	0.01	Tolylfluanid	0.01
Dodine	0.01	Mandipropamid	0.01	Triadimefon	0.01
Epoxiconazole	0.01	Mepanipyrim	0.01	Triadimenol	0.01
Etridiazole	0.01	Mepronil	0.01	Tricyclazole	0.01
Famoxadone	0.05	Metalaxyl	0.01	Trifloxystrobin	0.01
Fenamidone	0.01	Metconazole	0.01	Trifloxystrobin acid	0.01
Fenarimol	0.01	Metominostrobin-(E)	0.01	Triflumizole	0.01
Fenbuconazole	0.01	Metominostrobin-(Z)	0.01	Triforine	0.01
Fenhexamid	0.01	Metrafenone	0.01	Triticonazole	0.01
Fenoxanil	0.01	Myclobutanil	0.01	Uniconazole	0.01
Fenpiclonil	0.01	Nitrothal-isopropyl	0.01	Vinclozolin	0.01

Agricultural compound	LOR (mg/kg)	Agricultural compound	LOR (mg/kg)	Agricultural compound	LOR (mg/kg)
Fenpropimorph	0.01	Octhilinone	0.01	Zoxamide	0.01

Table: Herbicides

Agricultural compound	LOR (mg/kg)	Agricultural compound	LOR (mg/kg)	Agricultural compound	LOR (mg/kg)
Acetochlor	0.01	Esprocarb	0.01	Oxadiazon	0.01
Alachlor	0.01	Ethalfluralin	0.01	Oxyfluorfen	0.01
Allidochlor	0.01	Ethametsulfuron-methyl	0.01	Pendimethalin	0.01
Ametryn	0.01	Ethofumesate	0.01	Phenmedipham	0.01
Anilofos	0.01	Ethoxysulfuron	0.05	Picolinafen	0.01
Atrazine	0.01	Etobenzanid	0.01	Pretilachlor	0.01
Benfluralin	0.01	Fenoxaprop-ethyl	0.01	Prometryn	0.01
Benoxacor	0.01	Fentrazamide	0.01	Propachlor	0.01
Bensulfuron-methyl	0.01	Flamprop	0.01	Propanil	0.05
Bensulide	0.01	Flamprop-methyl	0.01	Propaquizafop	0.01
Bentazone	0.05	Flazasulfuron	0.05	Propazine	0.01
Bifenox	0.01	Fluazifop-P	0.05	Propham	0.01
Bromacil	0.01	Fluazifop-P-butyl	0.01	Propyzamide	0.01
Bromobutide	0.01	Flufenacet	0.01	Prosulfocarb	0.01
Butachlor	0.01	Flumiclorac-pentyl	0.01	Pyraflufen-ethyl	0.01
Butafenacil	0.01	Flumioxazin	0.01	Pyrasulfotole	0.01
Butamifos	0.01	Fluometuron	0.01	Pyributicarb	0.01
Cafenstrole	0.01	Fluridone	0.01	Pyriftalid	0.01
Carbetamide	0.01	Fluthiacet-methyl	0.01	Pyriminibac-methyl-E	0.01
Carfentrazone-ethyl	0.01	Halosulfuron-methyl	0.01	Pyriminibac-methyl-Z	0.01
Chloridazon	0.01	Haloxyfop-etotyl	0.01	Pyroxsulam	0.01
Chlorimuron-ethyl	0.05	Haloxyfop-methyl	0.01	Quizalofop-ethyl	0.01
Chlorotoluron	0.01	Hexazinone	0.01	Rimsulfuron	0.01
Chloroxuron	0.01	Imazamethabenz-methyl	0.01	Saflufenacil	0.01
Chlorpropham	0.01	Imazosulfuron	0.05	Sebuthylazine	0.01
Chlorsulfuron	0.05	Indanofan	0.01	Sethoxydim	0.01
Chlorthal-dimethyl	0.01	Ioxynil	0.05	Simazine	0.01
Clethodim	0.01	Isoproturon	0.01	Simetryn	0.01
Clodinafop-propargyl	0.01	Isoxaben	0.01	Sulfentrazone	0.01
Clomazone	0.01	Karbutilate	0.01	Tebuthiuron	0.01
Cloquintocet-mexyl	0.01	Lactofen	0.01	Tepraloxydim	0.05
Cyanazine	0.01	Lenacil	0.01	Terbacil	0.01
Cyclanilide	0.01	Linuron	0.01	Terbumeton	0.01
Cyclosulfamuron	0.05	Mefenacet	0.01	Terbuthylazine	0.01
Cyhalofop-butyl	0.01	Mefenpyr-diethyl	0.01	Terbutryn	0.01
Daimuron	0.01	Mesotrione	0.01	Thenylchlor	0.01
Desmedipham	0.01	Metamitron	0.01	Thiazopyr	0.01
Dichlobenil	0.01	Methabenzthiazuron	0.01	Thidiazuron	0.01
Diclofop-methyl	0.01	Metobromuron	0.01	Thiobencarb	0.01
Dicloran	0.01	Metolachlor	0.01	Topramezone	0.01
Diclosulam	0.01	Metosulam	0.01	Tralkoxydim	0.01
Diflufenican	0.01	Metribuzin	0.01	Tri-allate	0.01
Dimepiperate	0.01	Metsulfuron-methyl	0.01	Triasulfuron	0.01
Dimethenamid	0.01	Monolinuron	0.01	Trifloxysulfuron sodium	0.05
Diphenamid	0.01	Napropamide	0.01	Trifluralin	0.01
Dithiopyr	0.01	Nitrofen	0.01	Triflusulfuron-methyl	0.05
Diuron	0.05	Norflurazon	0.01		
EPTC	0.01	Oryzalin	0.01		

Table: Herbicides – Glyphosate (Tested separately to other agricultural compounds)

Agricultural compound	LOR (mg/kg)	Agricultural compound	LOR (mg/kg)
Aminomethylphosphonic acid (AMPA)	0.01	Glyphosate	0.01

Table: Other agricultural compounds

Agricultural compound	LOR (mg/kg)	Agricultural compound	LOR (mg/kg)	Agricultural compound	LOR (mg/kg)
Anthraquinone	0.01	Forchlorfenuron	0.01	Piperonyl butoxide	0.01
Ethoxyquin	0.01	Inabenfide	0.01	Pymetrozine	0.05
Ethychlozate	0.01	Paclobutrazol	0.01	Tribufos	0.01

Table: Organochlorine environmental contaminants

Agricultural compound	LOR (mg/kg)	Agricultural compound	LOR (mg/kg)	Agricultural compound	LOR (mg/kg)
Aldrin	0.01	Dieldrin	0.01	Heptachlor-exo-epoxide	0.01
Chlordane-cis	0.01	Endosulfan sulfate	0.01	Hexachlorobenzene	0.01
Chlordane-trans	0.01	Endosulfan-alpha	0.01	Lindane	0.01
DDD-2,4	0.01	Endosulfan-beta	0.01	Methoxychlor	0.01
DDD-4,4	0.01	Endrin	0.01	Methylpentachlorophenyl sulfide	0.01
DDE-2,4	0.01	Endrin ketone	0.01	Mirex	0.01
DDE-4,4	0.01	HCH-alpha	0.01	Oxychlordane	0.01
DDT-2,4	0.01	HCH-beta	0.01	Pentachloroaniline	0.01
DDT-4,4	0.01	HCH-delta	0.01	Pentachlorobenzene	0.01
Dicofol-2,4	0.01	Heptachlor	0.01		
Dicofol-4,4	0.01	Heptachlor-endo-epoxide	0.01		