Glyphosate – Overview of Use and Monitoring in New Zealand

December 2015

Glyphosate is the most widely used herbicide in the world, including in New Zealand. It is an organophosphorus compound that inhibits the synthesis of certain proteins that are essential for plant growth. More specifically, glyphosate stops the shikimic acid pathway, which is found only in plants and some microorganisms. Glyphosate use targets unwanted weeds, but may also affect non- target microorganisms. It is very effective against a wide range of unwanted weeds in agricultural and horticultural situations. Glyphosate is readily absorbed and translocated by plants. It does not bio accumulate in mammals as it is rapidly excreted unchanged.

Regulation of Glyphosate

In New Zealand, glyphosate sale and use is regulated under the Agricultural Compounds and Veterinary Medicines (ACVM) Act 1997 and the Hazardous Substances and New Organisms (HSNO) Act 1996. The ACVM Act seeks to achieve its purpose by providing that no agricultural compound may be used in New Zealand unless that use is authorised by or under this Act.

Companies manufacturing and selling glyphosate are required to apply for registration under the ACVM Act before the product is marketed. The purpose of this Act is to manage risks to public health, trade in primary produce, animal welfare and agricultural security. The registration process follows international best practice and includes risk assessment and imposing conditions of registration for each product. The focus of these conditions is to ensure product safety and characterisation, quality, labelling and advertising compliance as well as effective management of residues.

As at 13 October 2015, there were 89 trade name products registered under the ACVM Act containing glyphosate.

MPI has established thresholds and criteria for public health, trade, safety and security. These criteria are based on international best practice and take New Zealand's specific concerns into consideration. The criteria form the basis for determining the level of regulatory oversight of agricultural compounds, such as glyphosate, and sets the minimum data required to support an application for registration.

Registration of a trade name product requires a thorough scientific assessment of chemistry and manufacturing information, efficacy, animal and plant safety and residues in food and feed commodities. The assessment of residue information is also used to establish Maximum Residue Limits under the Food Act 1981 for agricultural compounds. All glyphosate products used in New Zealand have been assessed in accordance with these parameters prior to being approved for sale.

The HSNO Act is administered by the Environmental Protection Authority (EPA). The purpose of the HSNO Act is to protect human health and the environment by preventing or managing any harmful effects of hazardous substances and new organisms.

The EPA regulates the manufacture, import, use, storage and transhipment of hazardous substances such as glyphosate.

The HSNO Act covers mixtures and finished products in addition to single chemical substances, as well as requirements for the certification and approval of people and equipment relating to hazardous substances (such as bulk storage tanks and tank wagons, burners, dispensers, vaporisers and compressed gas cylinders).

While approvals for hazardous substances under HSNO can be specific to a substance they can cover single chemicals or chemical products or they can cover groups of hazardous substances. They are valid until they are declined through reassessment.

The EPA assesses the risks to human health and the environment associated with the use of hazardous substances and recommends controls on how they can be used. These controls cover the full lifecycle of a substance including requirements for how substances are contained, labelled, stored, used, transported or disposed of.

Trade name products that require registration under the ACVM Act cannot be registered unless they have first been approved under the HSNO Act.

Residues in food

Maximum Residue Limits (MRLs) indicate the maximum levels at which residues of agricultural compounds and veterinary medicines may be legally present in food for sale. The purpose of an MRL is to minimise risk to public health by ensuring that the methods of food production keep agricultural compound residues in food to safe levels.

MRLs are primarily a tool for monitoring the use of agricultural compounds against good agricultural practice (GAP). GAP is the generally-accepted means of producing safe primary produce without overuse of pesticides. Thus, GAP is about ensuring that chemical residues in food are as low as practicable, without compromising the ability of the chemical to successfully do what is intended.

In the New Zealand (Maximum Residue Limits of Agricultural Compounds) Food Standards 2015 issued under the Food Act 1981 there is a MRL of 0.01 (at the limit of quantification) for glyphosate in fruit. For all other uses the default MRL of 0.1mg/kg would apply.

Food safety

MPI generally uses established World Health Organization's Acceptable Daily Intakes (ADIs) or the Potential Daily Exposure established by the EPA for food when assessing food safety risk. Both of these parameters are estimates of the quantity of a particular compound in a food which can be consumed by a person on a daily basis over an entire lifetime, without causing any health effects. They are expressed as how many milligrams of the compound can safely be consumed per kilogram of body weight every day for an entire lifetime.

The ADI for glyphosate is 1 milligram per kilogram of body weight. Exposure to glyphosate through consumption of food should not exceed this ADI.

The acceptable daily intake for glyphosate is high (meaning of low toxicity), and the chronic dietary intake exposure for glyphosate has been assessed to be less than 1% of this acceptable level of exposure over the lifetime for both adults and children.

Glyphosate's toxicity and dietary risk has been reviewed in detail by the World Health Organization and the Food and Agriculture Organization of the United Nations which concluded that it is of very low toxicity. MPI has adopted this conclusion in its assessment of the dietary risk of glyphosate to the New Zealand public. However, as a result of the recent review of glyphosate by the International Agency for Research on Cancer, glyphosate is to be re-evaluated in 2016 by the European Food Safety Authority and the Expert Task Force established by the WHO to update that risk assessment to include all new data generated since the previous evaluation. MPI will take into account the re-evaluation when it is published.

Residue monitoring

Dairy monitoring and surveillance programmes for selected substances of interest have been in operation in New Zealand for many years, and a national programme monitoring raw milk was introduced in the 1996/97 dairy season. Since that time the programme has become an official programme under the Dairy Industry (National Residue Monitoring Programme) Regulations 2002,

and is administered by MPI.

New Zealand's dairy monitoring and surveillance programme is better known as the National Chemical Contaminants Programme (NCCP) and is designed to confirm: the effectiveness of the regulatory controls in place for ensuring chemical residues in milk and manufactured dairy products do not pose a threat to human health; that good agricultural practices are being followed, and that all relevant importing country requirements will be met. In addition surveys are undertaken as necessary to identify new or emerging risk factors or enhance the understanding of potential issues and natural background levels for minor components naturally in milk.

The monitoring programme is regarded as confirmation that regulatory controls are working effectively and as such it serves as a verification measure. The programme is designed to identify where controls may not be working and enable an appropriate investigation to be undertaken to determine the root cause and establish options to correct the situation.

Testing for glyphosate

Under the NCCP, raw milk is periodically monitored for glyphosate:

In the 2011/12 dairy season, MPI analysed 50 raw milk samples taken from the farm bulk milk tank for glyphosate. The test results confirm there was no glyphosate or its main metabolite AMPA found in these samples.

In the 2014/15 dairy season MPI analysed 300 raw milk samples for glyphosate. The test results again confirmed there was no glyphosate or AMPA found in these samples.

In addition to the routine monitoring of raw milk, MPI undertook a survey of 60 processed fresh milk and cream samples in the 2014/15 dairy season, collected from a range of retail outlets. The test results confirm there was no glyphosate or AMPA found in these samples.

These results support the findings of the NCCP that glyphosate and AMPA residues are not detected in liquid dairy products sourced from New Zealand.

MPI's testing of milk for glyphosate is undertaken by AsureQuality, using its Wellington laboratory which is contracted to MPI for the delivery of testing services.

The method used is robust, fit-for-purpose and reports results that New Zealand and overseas consumers and regulators can trust and have every confidence in.

We know this because:

- The AsureQuality method has been validated in accordance with internationally agreed standards. These standards are in place to ensure the method performs with reliability and within known parameters, including repeatability and precision, when testing matrices are included in the validation scope.
- The European Union regularly conducts official audits of AsureQuality to check that it is performing in accordance with European requirements for sampling and testing. These audits confirm that the laboratory performs to an extremely high international standard. The laboratory has accreditation from International Accreditation New Zealand (IANZ) to the ISO17025:2005 standard. IANZ is a full signatory member of the International Laboratory Accreditation Cooperation (ILAC) and the regional body, Asia Pacific Laboratory Accreditation Cooperation (APLAC). More information about IANZ, and the processes it requires to gain accreditation is available on its website, here: http://www.ianz.govt.nz/.

The test method used by AsureQuality has been validated in accordance with international standards and is a reliable measure of the presence of glyphosate in milk.

MPI has every confidence in the accuracy and validity of the testing conducted by AsureQuality.

MPI engagement with interest groups

MPI has been in regular engagement with a group of individuals with an interest in this matter. We have had regular communication with this group since 7 May 2015 through face-to-face meetings, emails and phone calls regarding glyphosate residue.

The group claimed it had carried out testing of New Zealand liquid milk products, purchased at retail in New Zealand and the test results showed levels of glyphosate residue. The results presented to MPI by the group were said to be from testing carried out by a laboratory contracted by the group. The laboratory has no accreditation and there is no laboratory of its name listed as a testing laboratory under IANZ.

MPI was provided with 5 results from samples tested by the laboratory. Conversations with the laboratory raised a number of concerns in relation to the method used.

It advised MPI that it based testing on a 2013 EU standard test method, but noted its sample preparation differed from that proscribed by the method, due to a number of changes it made to it. The lab said it kept a written description of the method it was using, and QC charts, but was unable to provide these records. Rather than pursue the inconsistencies and lack of clarity on sampling and test methodology used by one of those groups, MPI chose to undertake its own rigorous survey of milk and fresh cream purchased at retail sale.

MPI's approach to date has been to ensure absolute scientific rigour in our testing survey and to present any response on this basis. MPI undertook extensive glyphosate testing in an accredited lab with an approved, validated method, as detailed above. All technical documents, including a summary of the test method and a report of the results for the processed fresh milk and cream survey, were freely provided to the group. In addition, the group has been hosted at the MPI contracted testing laboratory where it, with the senior scientists, worked through the sample receipt, preparation, analysis, interpretation and reporting of results for the processed fresh milk and cream survey.

As part of our precautionary approach, MPI tested retention samples from the batches of raw milk that went into the retail product the group claimed to have had tested (and which had the alleged glyphosate detections). We were able to do this as the batch identification could be seen in photos of the tested samples provided to us by the group. The samples of these batches had been retained for testing due to the unrelated 1080 testing programme. There were no glyphosate detections in any of these retention samples.

The health and safety of consumers is, and will always be, MPI's number one priority.