INTERGOVERNMENTAL GROUP ON TEA

INTERSESSIONAL MEETING

Report of the Working Group on Maximum Residue Levels[[1]](#footnote-1)

1. **Background**

The Working Group (WG) on Maximum Residue Levels (MRLs) in Tea was established at the Bali meeting of the IGG on Tea (IGG/Tea) in 2005 to assist data generation and submission as required for fixation of MRLs of pesticides in tea. Since the 1990s, pesticide residues in tea has been a major non-tariff trade barrier affecting tea trade globally. The problem was due mostly to certain default MRLs set at analytical detection limits and the only way to tackle this problem was to help fix realistic MRLs which would be acceptable to all stakeholders in order to ensure food safety as well as smooth tea trade globally.

At the first meeting of the WG in Kolkata, a roadmap was prepared to work on 24 pesticides selected on the basis of global use pattern. The objective was to generate data for fixing Codex MRLs as well as to use the data for fixing national MRLs which may lead to harmonization. Since then Codex MRLs in tea were fixed for 17 pesticides and the work of this initiative contributed to this process.

At the intersessional meeting in Milan, held on 14-15 Oct 2015, the group examined progress made, reviewed the priority list, recommended to continue the activities defined in the work plan and proposed that the policy document on the brew factor based risk assessment for fixation of MRL in tea be submitted to Codex.

The following action plan was formulated:

1. To assess status of field trials required for setting Codex MRLs and submission of the list for advance notification to the IGG/Tea and National Codex Points.
2. To update priority list based on new information on Risk assessment, or Replacements or Potential use in Tea.
3. To share information on consuming countries on MRL restrictions.
4. To assess status and development of required infrastructure and new methods to cope with changing situations and cost.
5. Communication plan for quick information exchange and advance notification for simultaneous data submission by members and seeking manufacturers support to negate adverse publicity.
6. Data submission to include brew factor based risk assessment for all teas traded globally except Matcha Tea.
7. To share available information on anthraquinone, nicotine and other contaminants and to carryout a global study to generate data on occurrence in tea. India, Sri Lanka, China, Kenya, Japan, UK and Germany agreed to participate in this collaborative study.
8. Explore a potential representation in CODEX for tea to give agreed position a voice.
9. Share information on development of pest resistance.
10. The policy document entitled “Guidance Document on Risk Assessment Using Brew Factor for Fixation of MRLs of Pesticides in Tea” will be submitted to the CCPR and JMPR for reference.

The policy document entitled “Guidance Document on Risk Assessment Using Brew Factor for Fixation of MRLs of Pesticides in Tea” was submitted to IGG/Tea Secretariat for forwarding to the CCPR/JMPR.

At the 22nd session of the IGG/Tea, held on 25-27 May 2016, in Naivasha, Kenya, the Group agreed to continue the activities outlined in the work plan. In addition, the Group agreed to:

1. Consider creating an international tea NGO to represent the trade at CODEX;
2. Share existing research on contaminants such as nicotine and anthraquinone; and
3. Post information and progress against the workplan on the WG forum.

The WG on MRLs in Tea Brew completed its work programme.

1. **Status on MRLs**
2. **JMPR data submission for MRL fixation**

Under the 2013 JMPR Follow-up Evaluation Schedule, two pesticides –viz., fenpyroximate and propiconazole used in tea in India were included. The data on propiconazole and fenpyroximate in JMPR format was submitted to National Codex Point for evaluation by JMPR in December, 2012. In March, 2013 data for 2,4-D and imidacloprid were submitted by India to national Codex Point for evaluation by JMPR under 2014 JMPR Follow-up Evaluation Schedule.

Under 2015 JMPR New Compounds Schedule, the pesticide fenazaquin and under the 2015 JMPR Follow-up Evaluation Schedule, acetamiprid and tebuconazole are included. These two compounds are in the priority list and work on data generation is in progress.

In China, field trials were carried out to generate residue data in tea for acetamiprid (4 trials), emamactin benzoate (2 trials) and flubendiamide (2-trials), oxyfluorfen (2-trials), thiacloprid and in India as per the priority list. The data generated is being compiled for submission. The risk assessment was carried out using the brew factor.

The supervised field trials as par GAP for chlorfenapyr, indoxacarb and tolfenpyrad have been conducted and completed in Chinaduring2011-2013. The field trials for chlorfenapyr, indoxacarb and tolfenpyrad were conducted in four locations in 2010-2012, 2011-2012 and 2012-2013 respectively.

In India, a set of multi-locational supervised field trials were carried out to generated additional data on emamectinbenzoate, flubendiamide, imidacloprid, acetamiprid, propiconazole, thiamethoxam, dimethoate, hexaconazole, fenpyroximate, mancozeb, bifenthrin, clothianidin, fenpyroximate, profenophos, hexythiazox, cypermethrin and L-cyhalothrinin tea in 2014 and 2015.

The Data for 12 pesticides (acetamiprid, ethion, fenazaquin, dimethoate, imidacloprid, profenofos, quinalphos, L-cyhalothrin, 2-4-D, propiconazole, hexaconazole, tebuconazole) currently used and having potential for use in tea were submitted through National Codex Point in Jan 2016 from field trials carried out by Tea Research Institutes at Tocklai and UPASI in India for JMPR evaluation in 2017.

Data on hexaconazole, propiconazole, thiamethoxam, quinalphos, flubendiamide and emamactin benzoate were also submitted in Sep 2016 and May 2017 for revision/fixation of national MRLs in tea in India using brew factor for risk assessment.

1. **China**

As the replacement of GB 2763-2014, GB 2763-2016 (National food safety standard-Maximum residue limits for pesticides in food), was issued by MOA (Ministry of Agriculture of the People’s Republic of China) in 2016. In the new regulation, more than 40 MRLs for pesticide have been granted (Table 1). From the comparison, it concludes that EU MRLs are stricter than that in China. Most of MRLs for pesticides in China are the same or lower than that in Japan. The differences of MRLs for pesticides between countries or international organizations have been blocking the tea trade. Efforts are needed to harmonize the MRLs of pesticide among tea producing countries and tea importing countries and organizations.

**Table 1 Comparison of MRLs for pesticides in tea in China, EU and Japan**

|  |  |  |  |
| --- | --- | --- | --- |
| **Pesticides** | **China MRL**  **mg/kg** | **EU MRL**  **mg/kg** | **Japan MRL**  **mg/kg** |
| Acephate | 0.1 | 0.05\* | 10 |
| Acetamiprid | 10 | 0.05\* | 30 |
| Bifenthrin | 5 | 30 | 30 |
| Buprofezin | 10 | 0.05\* | 30 |
| Carbendazim | 5 | 0.1\* | 10 |
| Carbofuran | 0.05 | 0.05\* | 0.2 |
| Cartap | 20 | 0.1\* | 30 |
| Chlorfenapyr | 20 | 50 | 40 |
| Cyhalothrin and λ-cyhalothrin | 15 | 1 | 15 |
| Cyfluthrin  beta-cyfluthrin | 1 | 0.1\* | 20 |
| Cypermethrin  beta-cypermethrin | 20 | 0.5 | 20 |
| DDT | 0.2 | 0.2\* | 0.2 |
| Demeton | 0.05 | 0.05\* | 0.05 |
| Deltamethrin | 10 | 5 | 10 |
| Diafenthiuron | 5\* | 0.01 | 20 |
| Dicofol | 0.2 | 20 | 3 |
| Difenoconazole | 10 | 0.05\* | 15 |
| Diflubenzuron | 20 | 0.1\* | 20 |
| Endosulfan | 10 | 30 | 30 |
| Ethoprophos | 0.05 | 0.02\* | - |
| Fenazaquin | 15 | 10 | - |
| Fenpropathrin | 5 | 2 | 25 |
| Fenitrothion | 0.5 | 0.05\* | 0.2 |
| Fenvalerate/  S-fenvalerate | 0.1 | 0.1\* | 1.0 |

**Table 1 Comparison of MRLs for pesticides in tea in China, EU and Japan (cont’d)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Pesticides** | **China MRL**  **mg/kg** | **EU MRL**  **mg/kg** | **Japan MRL**  **mg/kg** |
| Flucythrinate | 20 | 0.05\* | 20 |
| Glufosinate-ammonium | 0.5 | 0.1\* | 0.3 |
|  |  |  |  |
| Glyphosate | 1 | 2 | 1 |
| Hexachlorocyclohexane | 0.2 | alpha-isomer 0.01\*, beta-isomer 0.01\*, lindane(gamma-isomer)0.01\* | 0.2 |
| Hexythiazox | 15 | 4 | 35 |
| Imidaclothiz | 3\* | 0.01 | - |
| Imidacloprid | 0.5 | 0.05\* | 10 |
| Indoxacarb | 5 | 5 | - |
| Isazofos | 0.01 | 0.01 | - |
| Isocarbophos | 0.05 | 0.01 | - |
| Methomyl | 0.2 | 0.05\* | 20 |
| Methamidophos | 0.05 | 0.05\* | 5 |
| Omethoate | 0.05 | 0.05\* | 1 |
| Parathion-methyl | 0.02 | 0.05\* | 0.2 |
| Permethrin | 20 | 0.1\* | 20 |
| Phorate | 0.01 | 0.05\* | 0.1 |
| Phosfolan | 0.03 | 0.01 | - |
| [Phosfolan-methyl](http://dict.youdao.com/w/phosfolan-methyl/#keyfrom=E2Ctranslation) | 0.03\* | 0.01 |  |
| Phoxim | 0.2 | 0.1 | 0.1 |
| Pymetrozine | 2 | 0.1\* |  |
| Pyridaben | 5 | 0.05\* | 10 |
| Terbufos | 0.01 | 0.01\* | 0.005 |
| [Thiamethoxam](http://dict.youdao.com/w/thiamethoxam/#keyfrom=E2Ctranslation) | 10 | 20 | 20 |
| Trichlorfon | 2 | 0.05\* | 0.5 |

\* Indicates lower limits of determination.

1. **Draft Kenya Standard KS 2128: 2015doption of codex standards**

Kenya introduced a *Draft Kenya Standard KS 2128: 2015* in August 2015 with a code of practice in tea. In the Annexure C of this standard, MRLs have been proposed for 14 compounds based on Codex MRLs (Table 2).

**Table 2. List of pesticides and maximum residue limits for tea (Green tea/Black tea)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl No.** | **Pesticides** | **Kenya**  **MRL (mg/kg)** | **Codex MRL**  **(mg/kg)** |
| 1. | Paraquat | 0.2 | 0.2 |
| 2. | Methidathion | 0.5 | 0.5 |
| 3. | Clothianidin | 0.7 | 0.7 |
| 4. | Fenpropathrin | 2 | 2 |
| 5. | Chlorpyrifos | 2 | 2 |
| 6. | Deltamethrin | 5 | 5 |
| 7. | Propargite | 5 | 5 |
| 8. | Endosulfan | 10 | 10 |

**Table 2. List of pesticides and maximum residue limits for tea (Green tea/Black tea)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl No.** | **Pesticides** | **Kenya**  **MRL (mg/kg)** | **Codex MRL**  **(mg/kg)** |
| 9. | Etoxazole | 15 | 15 |
| 10. | Hexythiazox | 15 | 15 |
| 11. | Cypermethrins (including alpha- and zeta- cypermethrin) | 15 | 15 |
| 12. | Permethrin | 20 | 20 |
| 13. | Thiamethoxam | 20 | 20 |
| 14. | Bifenthrin | 30 | 30 |

This is a certain move towards harmonization. The information was posted in the FAO-IGG Forum for benefit to members.

1. **Harmonization of MRLs**

The harmonization of MRLs internationally was the goal set by this group initially. It is acknowledged that due to the different regulatory evaluation processes in different counties, evaluation of the same field trial data package can result in different MRLs. Since Feb2016, MRLs have been granted for buprofezin (2016), clothianidin (2016), cyantraniliprole (2016), pyiproxyfen (2016), fenpyroximate (2017) and tolfenpyrad (2017) in Canada; for acequinocyl (2017), cyantraniliprole (2017), fenazaquin (2017), flonicamid (2017), fluazinam (2017) and pyriproxyfen (2016) in the USA; indoxacarb (2015) in the EU. In Australia an MRL was established for indoxacarb (2016).

Australia is also currently proposing to establish MRLs under the category ‘All other foods except animal food commodities’ for a number of chemicals, some of which may be significant for tea where specific MRL are not already established.

In addition, the MRL for endosulfan in tea in the USA has expired.

A comparison of current Codex and consuming country MRLs shown below in Table 3 indicate where progress has been made and where adoption of realistic MRLs is still required.

**Table 3. Comparison of MRLs of a few pesticides in tea fixed by CODEX and some countries**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pesticides** | **CODEX MRL (mg/kg)** | **EU MRL**  **(mg/kg)** | **USA**  **(mg/kg)** | **Canada**  **(mg/kg)** | **Australia**  **(mg/kg)** | **Japan**  **(mg/kg)** |
| 2,4-D | - | 0.1\* |  |  |  |  |
| Acetamiprid | - | 0.05\* | 50 |  |  | 30 |
| Azoxystrobin | - | 0.05\* | 20 | 20 | 20(T) | 10 |
| Bifenthrin | 30 | 5 | 30 | 30 | 5 | -30 |
| Buprofezin | 30 (Green) | 0.05\* | 20 | 30 |  | 30 |
| Chlorfenapyr |  | 50 |  | 70 | 50 | 40 |
| Chlorpyrifos | 2 | 0.1\* |  |  | 2 | 10 |
| Clothianidin | 0.7 | 0.7 | 70 | 70 | 0.7(T) | 50 |
| Cypermethrin | 15 | 0.5 |  |  | 0.5 | 20 |
| Deltamethrin | 5 | 5 |  | 7 | 5 | 10 |

**Table 3. Comparison of MRLs of a few pesticides in tea fixed by CODEX and some countries (cont’d)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pesticides** | **CODEX MRL (mg/kg)** | **EU MRL**  **(mg/kg)** | **USA**  **(mg/kg)** | **Canada**  **(mg/kg)** | **Australia**  **(mg/kg)** | **Japan**  **(mg/kg)** |
| Dicofol | 40 | 20 | 50 |  | 5 | 3 |
| Endosulfan | 10 | 30 |  |  | 10 | 30 |
| Ethion | - | 3 |  |  | 5 | 0.3 |
| Etoxazole | 15 | 15 | 15 | 15 | 15 | 15 |
| Fenazaquin | - | 10 | 9 |  |  |  |
| Fenpropathrin | 3 | 2 | 2 | 2 | 2 | 25 |
| Fenpyroximate | - | 0.05\* | 20 | 44 | 0.1 | 40 |
| Flubendiamide | 50 | 0.02\* |  | 50 | 0.02 | 50 |
| Flufenoxuron | 20 | 15 |  |  |  | 15 |
| Glufosinate ammonium | - | 0.1\* |  |  | 20(T) | 0.3 |
| Glyphosate | - | 2.0 | 1 |  | 2 | 1 |
| Hexaconazole | - | 0.05\* |  |  |  |  |
| Hexythiazox | 15 | 4 |  |  | 4 | 15 |
| Imidacloprid | 50 | 0.05\* |  |  |  | 10 |
| Indoxacarb | 5 | 5 |  |  | 5 |  |
| L-cyhalothrin | - | 1 |  | 2 | 1 | 15 |
| Methidathion | 0.5 | 0.1\* |  |  |  | 1 |
| Oxyfluorfen | - | 0.05\* |  |  |  |  |
| Paraquat | 0.2 | 0.05\* |  |  | 0.5(T) | 0.3 |
| Permethrin | 20 | 0.1\* |  |  | 0.1 | 20 |
| Propargite | 5 | 0.05\* | 10 |  |  | 5 |
| Propiconazole | - | 0.05\* | 4 | 4 |  | 0.1 |
| Spiromesifen | - | 50 | 40 | 60 | 50 | 30 |
| Thiacloprid | - | 10 |  |  | 10 | 30 |
| Thiamethoxam | 20 | 20 | 20 |  | 20 | 20 |
| Tolfenpyrad | 30 (Green) | 0.01 | 30 | 30 |  | 20 |

*\** Indicates lower limit of analytical determination*;* (T) temporary*.*

<http://www.fao.org/fao-who-codexalimentarius/standards/pestres/commodities-detail/en/?c_id=101>

The Food Safety and Standard Authority of India (FSSAI) has also undertaken an initiative in May 2013 to harmonize its own standards with that of Codex or other International standards and various stakeholders have been engaged in e-working groups. The work is in progress[[2]](#footnote-2).

In order to harmonize the calculation of MRLs so that the evaluation of the same set of residue trial data results in the almost similar MRL recommendation, use of the OECD calculator may be actively considered. The OECD calculator is adopted in countries like India since 2013. This approach may hasten the ultimate objective of harmonization of MRLs of different countries.

In 2008-2015, seven international MRLs for endosulfan (CAC and EPA), cypermethrin (CAC), bifenthrin (EPA) and indoxacarb (China, CAC and EU) have been regulated on the basis of data submitted by China and IGG.

In the new national standard of China GB 2763-2016, the fixation of new MRLs fully referred the international MRLs in order to harmonize the standards. China has also assisted in the modification of seven international MRLs (Table 4).

**Table 4. Modification of seven international MRLs with data provided by China**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Pesticides** | **Regulator** | **Initial MRLs**  **mg/kg** | **To be modified MRLs mg/kg** | **Modified MRLs mg/kg** | **Year** |
| Endosulfan | US EPA | 30 | 0.01 | 10 | 2008 |
| CAC | 30 | 0.01(EU suggest) | 10 | 2010 |
| Cypermethrin | CAC | 20 | 0.01(EU suggest) | 15 | 2012 |
| Bifenthrin | US EPA | 5 | 0.01 | 5 | 2009 |
| Indoxacarb | CAC | not set | not set | 5 | 2014 |
| EU | 0.05 | 0.05 | 5 | 2015 |
| China | 3 | 5 | 5 | 2015 |

1. **Concerns on neonicotinoids**

The adverse effects of neonicotinoids have been criticized, especially the neurotoxicity, reproductive toxicity and the developmental neurotoxicity potential. In the report of the WG on pesticide maximum residues in tea brew (2014), drafted by Chinese delegation, it indicates the risk exposure of imidacloprid and acetamiprid via tea brew is high, due to the high detection rate and high infusion rate of imidacloprid and acetamiprid from dry tea to tea brew. Selection of pesticides with low water solubility to substitute the imidacloprid, acetamiprid, and dimethoate has been conducted since 2011 in China. On the basis of the bioassay and residue dynamic experiments (FAO-IGG Report 2015, FAO-IGG Report 2016), chlorfenapyr, indoxacarb and tolfenpyrad were selected to replace the neonicotinoids to protect tea trees from the tea leafhopper (*Empoasca vitis*), tea geometrid (*Ecrotropis obliqua*) and tea thrip (*Dendrothrips minowai*). Chlorfenapyr, indoxacarb and tolfenpyrad were registered in China in 2012, 2013 and 2016, respectively. Around more than 100,000 hectares of tea garden were applied with these three pesticides in the period of 2012-2016 and results obtained were satisfactory.

Tolfenpyrad was registered in China in 2016 and a low infusing rate (2-4%) of tolfenpyrad was observed in tea brew. The MRLs of tolfenpyrad is 20 mg/kg in China, Japan and USA, while default MRL of 0.01 mg/kg is in EU. It is necessary to unify the MRLs of tolfenpyrad in different countries and organizations. Relevant work will be done in China to generate the data.

1. **Information on MRL restrictions in consuming countries**

The US has restriction for ethion, DDT, triazophos, lindane and tetradifon in their Do Not Use list.

Canada has consulted with PMRA on the US Tea Association's Do Not Use list and the PMRA has taken a very pragmatic approach indicating that any of the compounds could have import MRLs established provided sufficient data were submitted for review.  Practically though, it is highly unlikely that some of the compounds listed would be profitable enough to warrant the generation of additional data.  Consequently it is unlikely that some of the compounds on the US list would obtain import MRLs in Canada.

Imidacloprid and acetamiprid have been paid great attention to in China. The ceasing application plan of these two neonicotinoids were conducting in some tea producing provinces in China including Guizhou and Zhejiang. Representing reverse effect and export problem, imidacloprid and acetamiprid were advised not to use in tea plantation in China. In the following years, besides collecting the data on residue on tea and toxicity, measures to decrease the amount of imidacloprid and acetamiprid applied in tea plantation will adopt, until zero application. Besides, the unreasonable high MRL established in China will be recommended to revise in the future years.

1. **Progress made since 22st Session at Naivasha, Kenya held on 25-27 May 2016**
2. **To assess status of field trials required for setting Codex MRLs and submission of the list for advance notification to FAO-IGG and National Codex Points.**

**Data generation/submission/fixation of MRL in tea**

Additional information on tebuconazoleand GAP data prepared as per the format of FAO manual and authorised labels on propiconazole, fenazaquin and carbendazim in tea was submitted by India to codex in June 2016.

Data on hexaconazole, propiconazole, thiamethoxam, quinalphos,flubendiamide and emamactin benzoate were also submitted in Sep 2016 and May 2017 for revision/fixation of national MRLs in tea in India using brew factor for risk assessment.

As the replacement of GB 2763-2014, GB 2763-2016 (National food safety standard-Maximum residue limits for pesticides in food), was issued by MOA (Ministry of Agriculture of the People’s Republic of China) in 2016. In the new regulation, more than 40 MRLs for pesticide have been granted (Table 5). From the comparison, it concludes that EU MRLs are stricter than that in China. Most of MRLs for pesticides in China are the same or lower than that in Japan. The differences of MRLs for pesticides between countries or international organizations have been blocking the tea trade. Efforts are needed to harmonize the MRLs of pesticide among tea producing countries and tea importing countries and organizations.

**Table 5.** **Pesticides authorized for use on tea imported to the USA**

|  |  |  |
| --- | --- | --- |
| **Pesticides** | **MRL (mg/kg)** | **Most Recent Federal Register Date** |
| Acequinocyl | 40 | 1/18/2017 |
| Acetamiprid | 50 | 2/10/2010 |
| Azoxystrobin | 20 | 5/1/2015 |
| Bifenthrin | 30 | 9/14/2012 |
| Buprofezin | 20 | 10/17/2012 |
| Carfentrazone-ethyl | .1 | 3/31/2004 |
| Chlorantraniliprole | 50 | 7/27/2011 |
| Clothianidin | 70 | 3/29/2013 |
| Cyantraniliprole | 30 | 3/22/2017 |
| Dicofol: Tea Dried | 50 | 3/25/2013 |
| Dicofol: Tea Instant | 30 | 3/25/2013 |
| Dinotefuran | 50 | 9/12/2012 |
| Ethiprole | 30 | 4/6/2011 |
| Etofenprox | 5 | 11/27/2013 |
| Etoxazole | 15 | 4/13/2011 |
| Fenazaquin | 9 | 5/25/2017 |
| Fenpropathrin | 2 | 11/28/2012 |
| Fenproximate/Fenpyroximate | 20 | 12/12/2012 |
| Flonicamid | 40 | 5/11/2017 |
| Fluazinam | 6.0 | 5/11/2017 |
| Glyphosate: Tea Dried | 1 | 10/1/1980 |
| Glyphosate: Tea Instant | 7.0 | 10/1/1980 |
| Propargite | 10 | 8/1/2007 |
| Propiconazole | 4 | 12/24/2015 |
| Pyriproxyfen | 15 | 2/22/2016 |
| Spinosad | .02 | 12/5/2007 |
| Spiromesifen | 40 | 1/16/2013 |
| Thiamethoxam | 20 | 3/27/2013 |
| Tolfenpyrad | 30 | 1/9/2014 |

There has been very encouraging development in the United States as well in setting realistic MRLs of a large number of pesticides in tea. The recent updates are shown in Table 6 and pesticides pending registrations in the USA are shown in Table 7.

**Table 6. Pesticides authorized for use on tea imported to the USA**

|  |  |  |
| --- | --- | --- |
| **Pesticides** | **MRL (mg/kg)** | **Most Recent Federal Register Date** |
| Acequinocyl | 40 | 1/18/2017 |
| Acetamiprid | 50 | 2/10/2010 |
| Azoxystrobin | 20 | 5/1/2015 |
| Bifenthrin | 30 | 9/14/2012 |
| Buprofezin | 20 | 10/17/2012 |
| Carfentrazone-ethyl | .1 | 3/31/2004 |
| Chlorantraniliprole | 50 | 7/27/2011 |
| Clothianidin | 70 | 3/29/2013 |
| Cyantraniliprole | 30 | 3/22/2017 |
| Dicofol: Tea Dried | 50 | 3/25/2013 |
| Dicofol: Tea Instant | 30 | 3/25/2013 |
| Dinotefuran | 50 | 9/12/2012 |
| Ethiprole | 30 | 4/6/2011 |
| Etofenprox | 5 | 11/27/2013 |
| Etoxazole | 15 | 4/13/2011 |
| Fenazaquin | 9 | 5/25/2017 |
| Fenpropathrin | 2 | 11/28/2012 |
| Fenproximate/Fenpyroximate | 20 | 12/12/2012 |
| Flonicamid | 40 | 5/11/2017 |
| Fluazinam | 6.0 | 5/11/2017 |
| Glyphosate: Tea Dried | 1 | 10/1/1980 |
| Glyphosate: Tea Instant | 7.0 | 10/1/1980 |
| Propargite | 10 | 8/1/2007 |
| Propiconazole | 4 | 12/24/2015 |
| Pyriproxyfen | 15 | 2/22/2016 |
| Spinosad | .02 | 12/5/2007 |
| Spiromesifen | 40 | 1/16/2013 |
| Thiamethoxam | 20 | 3/27/2013 |
| Tolfenpyrad | 30 | 1/9/2014 |

**Table 7. Pesticides pending registrations in the USA**

|  |  |
| --- | --- |
| **Pesticides** | **Expected Tolerance Year** |
| Chlorfenapyr | 2017 |
| Cyclaniliprole | 2018 |
| L-Cyhalothrin | 2018 |
| Cypermethrin | 2018 |
| Flubendiamide | 2017 |
| Imidacloprid | 2017 |
| Permethrin | 2018 |
| Pyrifluquinazon | 2017 |

Currently, Canada has realistic MRLs of 17 pesticides in tea as shown in Table 8.

**Table 8. MRLs of pesticides in tea in Canada**

|  |  |
| --- | --- |
| **Pesticides** | **MRL (mg/kg) (Date of Regn)** |
| Fenpropathrin | 2.0  (December 2011) |
| Ethripole | 30 (October 2011) |
| Lambda Cyhalothrin | 2.0 (June 2011) |
| Propiconazole | 4.0 (November 2013) |
| Spiromesifen | 60 (August 2014) |
| Etoxazole | 15 (November 2014 ) |
| Deltamethrin | 7 (August 2015) |
| Azoxystrobin | 20 (October 2015) |
| Bifenthrin | 30 (January 2016) |
| Chlofenapyr | 70 (January 2016) |
| Buprofezin | 30 ( January 2016) |
| Clothianidin | 70 ( May 2016) |
| Cyantraniliprole | 60 ( August 2016) |
| Pyriproxyfen | 15 (August 2016) |
| Fenpyroximate | 44 ( February 2016) |
| Tolfenpyrad | 30 ( January 2017) |
| Fluebendiamide | 50 (April 2017) |

MRLs for Cyclaniliprole, Dinotefuran, Thiamethoxam and Imidalcloprid are pending with PMRA and cypermethrin, glyphosate (expecting submission in 2017) and acetamiprid are in priority.

1. **To update priority list based on new information on Risk assessment, or Replacements or Potential use in Tea.**

The priority list of chemicals for the data generation first prepared in 2005 for 24 pesticides has been updated in subsequent sessions. In the 22nd Session of the Group held in Naivasha, Kenya on 22-27May 2016, the priority list of compounds in different countries were reviewed in order to remove anomalies and duplication of work and the status was as follows:

**Table 9. Priority list of chemicals**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Pesticides** | **Data Availability** | **No of trials and Country** | **National MRLs**  **[MRL (Country)]** | **Data submitted to Codex and date** |
| Acetamiprid | Yes | 4(Japan) 4 (India)  8 (China) | 40 (Jp), 50 (US) | India (2016) |
| Bifenthrin | Yes | 6(Japan) 2(India) | 30 (Jp) , 30 (US) | 30 (2011) |
| Buprofezin | Submitted to EU# | 6(Japan) | 30 (Jp), 20 (US) | 30 (codex, Green Tea) |
| Chlorfenapyr | Yes | 2(Japan) 10 (China) | 0.01 (US), 40 (Jp) |  |
| Chlorfluazuron | Yes | 8 (Sri Lanka) 2(Japan) | 10 (Jp), | Not submitted |
| Chlorpyrifos | Yes | 2(Japan) 6 (India) | 10 (Jp), | 2 (2005) |
| Chromafenozide | Limited | 2(Japan) | 20 (Jp), |  |
| Clothianidin | Yes | 3(Japan) 2 (India) | 50 (Jp), 70 (US) | 0.7 (2011) |
| Cypermethrin | Yes | 2(Japan) 4(India) | 20 (Jp) | 15 (2012) |
| Dimethoate | Limited | 2 (India) | 1 (Jp) | India (2016) |
| Emamectin  Benzoate | In progress | 2(Japan) 2(India) | 0.5 (Jp) |  |
| Fenpropathrin | Yes | 2(Japan) 2 (India) | 25 (Jp), 2 (US), 2(Canada) | 2 (2007) |
| Fenpyroximate | Yes | 2(Japan) 2 (India) | 40 (Jp), 20 (US), 0.1 (Argentina) |  |
| Fipronil | Yes | 8 (Sri Lanka) | 0.002 (Jp) | Not submitted |
| Flubendiamide | Yes | 2(Japan) 6 (India) | 50 (Jp) | 50 (2011) |
| Flufenoxuron | Yes | 2(Japan) | 15 (Jp) | (8trials, 2014) |
| Imidacloprid | Yes | 2(Japan) 8 (Sri Lanka) 2 (India) | 10 (Jp) | Evaluation (8trials, 2015) |
| Permethrin | Limited | 2(Japan) | 20 (Jp) |  |
| Spiromesifen | Yes | 2(Japan) | 30 (Jp), 40 (US) |  |
| Thiacloprid | Yes | 4 (Japan) 2 (India) 8 (Registrant) | 30 (Jp) |  |
| Thiamethoxam | Yes | 4 (Japan) 4 (India) | 20 (Jp), 20 (US) | 20 (2011) |
| λ-Cyhalothrin | Yes | 2(Japan) 4 (India) | 15 (Jp) | India (2016) |
| Indoxycarb | Yes | 8(China) |  | Evaluation 2013 (8trials, China) |
| Dichorvos |  |  | 0.1 (Jp) |  |
| Novaluron | To be generated |  |  |  |
| Abamectin |  |  |  |  |
| Acequinocyl | In progress | 4(Japan) 0.5 (Argentina) | 0.5 (Argentina) 40 (Jp), |  |

**Table 9. Priority list of chemicals (cont’d)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Pesticides** | **Data Availability** | **No of trials and Country** | **National MRLs**  **[MRL (Country)]** | **Data submitted to Codex and date** |
| Chlofentezine |  | 2(Japan) | 20 (Jp) |  |
| Dicofol | Yes | 8(India) | 3(Jp) 5 (India) 50(US) | 50 (1997) Revoked 40 (2011, 5/8) |
| Ethion | Yes | 12(India) | 0.3(Jp), 5 (India) | India (2016) |
| Etoxazole | Yes | 4(Japan) | 15 (Jp), 15 (US) |  |
| Hexythiazox | In progress | Registration for tea deleted (Jp) | 35 (Jp) 4 (Argentina) | 15 (2012)  Codex MRL is established with the 8 field trials conducted in India. |
| Milbemectin | No | 2(Japan) | 0.7 (Jp) |  |
| Permethrin | Limited | 2(Japan) | 20 (Jp) |  |
| Polysulphide sulphur | Exempted |  |  |  |
| Propargite | Yes | 2(Japan) 4(India) | 5 (Jp), 10 (US),10 (India), 1 (Argentina) | 5 (2004) |
| Spiromesifen# | Yes | 2(Japan) | 30 (Jp), 40 (US), 60 (Canada) |  |
| 2,4-D | Limited | 1 (India) |  | India (2016) |
| Diuron | In progress | Not registered in Japan | 1 (Jp) |  |
| Glufosinate-ammonium | Limited | Not registered in Japan | 0.01 (India) 0.3 (Jp) |  |
| Glyphosate | Yes | 2 (Japan) | 0.5 (Argentina) 1 (US) -- Leaf  7 (US) – Powder 1 (Jp) |  |
| MCPA | Yes | 8 (Sri Lanka) |  | Not submitted |
| Metolachlor |  |  |  |  |
| Oxyfluorfen | In progress | 1 (India) |  |  |
| Paraquat | Yes | 8 (Japan)  2 (India) | 0.3 (Jp) | 0.2 (2006) |
| Azoxystrobin | Yes | 4 (Japan) | 10 (Jp), 20 (US) |  |
| Bitertanol | Yes | 8 (Sri Lanka) | 0.1 (Jp) | Not submitted |
| Chlorothalonil |  | 2 (Japan) | 10 (Jp) |  |
| Copper hydroxide | Yes | 2 (India), Not Required in Japan | 150 (India) as copper, Exempted (Japan, US) |  |
| Copper Oxychloride | Yes | 8 (Sri Lanka) 4 (Japan) 2 (India) | 150 (India) as copper, Exempted (US, Japan) | Joint Application with India |
| Copper oxide | No |  | Exempted (US, Japan) |  |
| Difenoconazol | Limited | 2 (Japan) | 10 (Jp) |  |

**Table 9. Priority list of chemicals (cont’d)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Pesticides** | **Data Availability** | **No of trials and Country** | **National MRLs**  **[MRL (Country)]** | **Data submitted to Codex and date** |
| Hexaconazole | Yes | 8 (Sri Lanka) 3 (India) | 0.05 (Jp) | India (2016) |
| Propiconazole | Yes | 8 (Sri Lanka) 3 (India) | 0.1 (Jp)  4 (Canada) | India (2016) |
| Pyraclostrobin |  | 8 (Sri Lanka) 2 (Japan) | 5 (Jp) | Not submitted |
| Tebuconazole | Yes | 4 (Sri Lanka) 2 (Japan) | 50 (Jp) | India (2016) |
| Thiophanate-methyl | To be done | 2 (Japan) | 7 (Jp) |  |
| Trifloxystrobin | To be done | 3 (Japan) | 5 (Jp) |  |
| Carboxim | To be done |  |  |  |
| Tolfenpyrad | Available | 8(China) | 20 (Jp), 30 (US) | 30 (Codex, Green Tea) |

**Notes:** a) Information on whether sufficient field trial data available are to be provided to the WG.  
 b) EU reservation.

As there are a number of trial data already available in different member countries, there is scope of pooling the data to obtain the required number of trials for MRL fixation in tea by simultaneous submissions for at least some compounds.

1. **Concerns from secondary standards – SAN**

The Sustainable Agriculture Network (SAN) standards (July 2017) includes a list of prohibited pesticides. There are 125 pesticides in that list out of which SAN has developed a procedure for exceptional pesticide use that grants justified and exceptional use for 26 compounds for some crops.

There were 10 compounds in the list of 26 pesticides (given on pages 5 and 6 of the document entitled *Procedure for Exceptional Pesticide Use*) that has concerns for the tea industry in India. Out of these 10 compounds, 8 are pesticide including a rodenticide (Zinc phosphide) and 2 are fertilizers (micronutrient). Hence, proper justification was given in the prescribed format sent for putting up our comments. These pesticides are also included in the SAN list of 26 pesticides subjected to the procedure for exceptional pesticide use as required to be sent by 31March 2017. The initiative was at the behest of UK Tea and Infusion Association. Similar request to SAN has also been sent by Sri Lanka and Indonesia. Additional Request for exceptional use in tea in India for carbandazim, fipronil, imidacloprid, glufosinate ammonium and paraquat dichloride by was sent by Tea Research Association, India on behalf of the Tea Industry 27 June 2017. If the proposed restrictions by SAN are implemented, over and above the statutory standards then there will be hardly any registered pesticides for use in tea against specific important pests in many tea growing countries.

1. **Use of the Proportionality Approach for Estimation of MRLs in tea**

When the residue field trials are carried out at different locations/countries with different application rates, comparison of the data for risk assessment may seem to be difficult. In those situations, instead of repeating the costly trials at comparable rates of application,the Proportionality Approach for Estimation of MRLs as described under section 2.3“MRL estimation using The Proportionality Approach”in the JMPR Report (2011) should be adopted by members so that using the available data from different locations/countries, realistic MRLs in tea (at GAP Registered rates) can be fixed using the data scaling factor where the actual application rates in a trial may differ by more than 25% from the authorised GAP.This practice will save considerable time and resources and the same data set can be utilized by multiple agencies. [Ref: *Pesticide Residues in Food, JMPR Report 2011*, Section 2.3, FAO Plant Protection Paper 211].

**Example: Illustration with a typical case of Fenpyroximate**

**GAPdose: 30g ai/ha**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Details on field trials | Trial I  (Dry 1999) | Trial II  (Dry 2011) | Trail III  (Dry 2014) | Trial IV  (Dry 2015) |
| Name and address of the institute /location where residue trail has been carried out | Location 1  (India) | Location 2  (India) | Location 3  (India) | Location 4  (India) |
| Dose rate | Control,  25 g ai/ha,  50 g ai/ha | Control,  10 g ai/ha,  20 g ai/ha | Control,  25 g ai/ha,  50 g ai/ha | Control,  20 g ai/ha,  40 g ai/ha |

Data scaling factor: [GAP application rate ÷ Actual application rate]   
 = [30/25]=1.2 for trial-I and III; [30/10]= 3 for trial-II and  
 [30/20]=1.5 for trial IV.

**Table 10. MRL estimation using The Proportionality Approach for Fenpyroximate**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Treatment | | Scaling Factor  (GAP/Actual field trial rate) | #Residue data (mg/kg) | | \*MRL proposed (mg/kg) | |
| GAP (CIB regd rate)  (kg ai/ha) | Actual field trial rate  (kg ai/ha) | Not scaled | Scaled | Without scaling | With scaling |
| 30 | 25 | 1.2 | 1.78 | 2.14 | No proposal | 8 |
| 30 | 10 | 3 | 0.60 | 1.8 |
| 30 | 10 | 3 | 0.65 | 1.95 |
| 30 | 10 | 3 | 0.67 | 2.01 |
| 30 | 25 | 1.2 | 1.00 | 1.2 |
| 30 | 25 | 1.2 | 1.10 | 1.32 |
| 30 | 25 | 1.2 | 1.16 | 1.39 |
| 30 | 20 | 1.5 | 2.74 | 4.11 |
| 30 | 20 | 1.5 | 2.71 | 4.07 |
| 30 | 20 | 1.5 | 2.66 | 3.99 |

\*Calculated using OECD MRL Calculator. [Replicated residue data]

1. **To assess status and development of required infrastructure and new methods to cope with changing situations and cost.**

Most of the pesticides in the priority list are amenable to analysis by LC or GC\_MS/MS and the conventional techniques are of little use. Therefore, required infrastructure for data generation with triple quad LC-MS/MS and GC-MS/MS based methods needs to be established. Source of funding needs to be explored as these equipment are very expensive.

1. **Communication plan for quick information exchange and advance notification for simultaneous data submission by members and seeking manufacturers support and to negate adverse publicity.**

The IGG forum provides a scope for use by members for quick information exchange as required for updating of priority list, advance notification by members for data submission and for seeking specific support from stakeholders and to negate adverse publicity.

1. **Data submission to include brew factor based risk assessment for all teas traded globally except Matcha Tea.**

Data submitted by India in Dec 2016 onacetamiprid, ethion, fenazaquin, dimethoate, imidacloprid, profenofos, quinalphos, L-cyhalothrin, 2-4-D, propiconazole, hexaconazole, tebuconazole in tea for JMPR evaluation were with brew factor based risk assessment. For more detailed data, supervised field trials as par Good Agricultural Practice (GAP) were conducted in China in 2014-2016. 14 pesticides including tolfenpyrad, indoxacarb, propargite, pyraclostrobin, chlorfluazuron, propiconazole, thiacloprid, imidacloprid, thiamethoxam, acetamiprid, dimethoate, dinotefuran, omethoate andpyridabenwere selected and the transfer rate of 14 pesticides from dry tea to tea brew were listed in Table 11.

**Table 11. Physical-chemical properties and transfer rate of pesticides from dry tea to tea brew**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Pesticide | Water solubility  (mg/L, 20℃) | Log Kow  (pH7, 20℃) | Henry's law Constant  (Pa m3 mol-1,25℃) | Transfer  (%) |
| Acetamiprid | 4200 | 0.8 | 5.30 × 10-8 | 93.0 |
| Chlorfluazuron | 0.012 | 5.9 | <1.6 × 10-3 | 2.5 |
| Dimethoate | 3980 | 0.704 | 1.42×10-6 | 115.9 |
| Dinotefuran | 398000 | -0.549 | <1.7×10-3 | 100.7 |
| Imidacloprid | 610 | 0.57 | 1.7 ×10-10 | 91.0 |
| Indoxacarb | 0.02 | 4.65 | 6.0 × 10-5 | 6.1 |
| Omethoate | Miscible | -0.74 | 3.3 | 24.9 |
| Propargite | 0.215 | 5.7 | 6.4× 10-2 | 2.5 |
| Propiconazole | 100 | 3.72 | 9.2× 10-5 | 102.4 |
| pyraclostrobin | 1.9 | 3.99 | 2.6 × 10-5 | 20.1 |
| Pyridaben | 0.012 | 6.37 | 1.0× 10-2 | 58.2 |
| Thiacloprid | 185 | 0.73 | 1.1 × 10-10 | 82.9 |
| Thiamethoxam | 4100 | -0.13 | 4.6×10-15 | 100.1 |
| Tolfenpyrad | 0.087 (20°C) | 5.61 (25 °C) | 2.2 × 10-3 | 4.4 |

1. **To share available information on anthraquinone, nicotine and other contaminants and to carryout a global study to generate data on occurrence in tea.**

India, Sri Lanka, China, Kenya, Japan, UK and Germany agreed to participate in this collaborative study. In the last meeting it was decided to share information on anthraquinone as it was detected in many tea samples from a number of countries. Subsequent to the UKTIA (UK-Tea and Infusion Association) and TRA (Tea Research Association, Tocklai, India) joint study completed in Dec 2015, a second UKTIA sponsored study has been in progress 2016-2017 with the participation of Kenya, Indonesia, Sri Lanka and China. Due to be completed summer 2017, the results will be disseminated when complete.

The issue of anthraquinone also re-emphasized the WGs identified action plan to assess the status and development of required infrastructure and new methods to cope with changing situations and the associated cost particularly in the producing countries.

Nicotine: Based on the results of the study conducted by the German Tea Association and due to the initiative of THIE and collaborative studies at Tocklai Tea Research Institutes, India, the EU-MRL of 0.6 mg/kg was extended until October 2021 (Reg. EU 2017/978).

1. **Explore a potential representation in CODEX for tea to give agreed position a voice.**

Members may consider participation of the WG-on MRLs in CCPR meetings. Feedback is sought from member countries on how this may best be achieved and supported. In a side meeting of the Coalition for Codex Reform there was a scope to provide a presentation on the economic impacts of non-harmonized MRLs and lack of Codex CXLs on Global tea trade and a presentation was made by Ms Louise Roberts on 24 April, 2017. The objective was to make a case of improved Codex standard setting performance. Such meetings gives members a scope to highlight specific cases outlining the economic impact of loss of tea trade or impact on manufacturers, traders or farmers of non-harmonized MRLs and lack of Codex CXLs.

The Tea Association of Canada represented the IGG/Tea on the International Agri-Food Network Coalition for Enhanced Codex. There were several initiatives this year:

* + Side event at the 71st session of the FAO Committee on Commodity Problem in Rome 4‑6 October 2016. The Ambassador of India was the Chair for this session and Dr Katie Donnelly represented the tea industry.
  + Louise Roberge participated in a monthly conference call.

1. **Share information on development of pest resistance.**

Information on development pest resistancein tea would help in better management of pest in the producing countries and will also help in revising the priority list. During the Naivasha session, Japan shared observations on pest resistance being seen with various compounds in Japan. Feedback is sought from other countries on their experiences. The members may share such information preferably through the FAO-IGG on Tea Forum.

1. **The policy document entitled “Guidance Document on Risk Assessment Using Brew Factor For Fixation of MRLs of Pesticides in Tea” will be submitted to the CCPR and JMPR for reference.**

The policy document entitled “Guidance Document on Risk Assessment Using Brew Factor for Fixation of MRLs of Pesticides in Tea” was submitted and presented at the 48th session of the CCPR in China, held on 25-30 April 2016[[3]](#footnote-3).

**Future Plan**

1. Continue data generation and submission through National Codex points for MRL fixation.
2. Submit data on brew studies for brew factor based risk assessment.
3. Communication plan for quick information dissemination.
4. Update priority list as necessary.
5. Assess required infrastructure for data generation and conformance monitoring. Explore funding.
6. To share available information on anthraquinone and other contaminants and carry out a global study on anthraquinone.
7. Explore a potential representation in CODEX for tea to give agreed position a voice. Consider participation of FAO-IGG on Tea WG-on MRLs in CCPR meetings.
8. Share information on development of pest resistance.

1. Submitted by India and the United Kingdom. [↑](#footnote-ref-1)
2. <http://www.fssai.gov.in/Portals/0/Pdf/Proceedings_of_Codex_workshop_II(02.11.13).pdf>; <http://www.fssai.gov.in/Portals/0/Pdf/scanpdf/AnnexureI-StrategyforStandardsDevelopment.pdf>. [↑](#footnote-ref-2)
3. http://www.fao.org/fao-who-codexalimentarius/shproxy/en/?lnk=1andurl=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FMeetings%252FCX-718-48%252FCRD%252Fpr48\_crd21x.pdf [↑](#footnote-ref-3)