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COMMITTEE ON COMMODITY PROBLEMS

INTERGOVERNMENTAL GROUP ON TEA

TWENTY-FIFTH SESSION

Guwahati (Assam), India, 31 January–2 February 2024

REPORT OF THE WORKING GROUP ON MAXIMUM RESIDUE LEVELS (MRLs)

Report of the Working Group on Maximum Residue Limits (MRLs)

Progress made since the 24th Session of the group held on 23rd February 2022 (Virtual Mode)

I. 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 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 the following:

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 work plan on the WG forum.

At the intersessional meeting held in Colombo, Sri Lanka held on 12-13Aug 2017, the group examined the progress made since May 2016, reviewed the priority list, recommended to continue the activities defined in the work plan and proposed the following work plan:

- Data generation and submission through national Codex points for MRL fixation;
- Submission of data on brew studies for brew factor based risk assessment
- Update of the priority list
- Assessment of the required infrastructure for data generation and conformance monitoring and possible funding
- Share existing research on the contaminants nicotine and anthraquinone
- Sharing of available information on anthraquinone and other contaminants and on the global study on anthraquinone
- Sharing of information on developments in pest resistance.
- Potential representation in CODEX for tea
- Consideration of the WG participating in meetings of the Codex Committee on Pesticide Residue(CCPR)
- Consider creating an international tea non-governmental organization (NGO) to represent the trade at CODEX
- Post information and progress against the work plan on the WG's room on the e-Forum.

In the 23rd session held at Hangzhou, China on 17-20 May 2018, the Group examined this agenda item with the assistance of a presentation delivered by the Chairpersons of the Working Group (WG) on MRLs and endorsed the report of the WG with its future work plan to include:

- The collection of data on pest resistance to plant protection products using the template developed by Japan. Japan will coordinate this activity;
- The identification of 1-2 compounds where sufficient field trials exist amongst the producing countries (min. 8 trials, inclusive of both black and green tea) and prepare joint dossiers for submission to JMPR;
- A review of the priority list of compounds. Members agreed to notify the Chairpersons of compounds that are no longer relevant for their country and propose new compounds which should be considered for addition to the priority list; and
- Agreement of the group in principal to undertake a research project to understand the link between the environment and the presence of contaminants such as anthraquinone in tea. A project proposal will be developed by THIE and the Chairpersons for further consideration of the Group.
- All data submissions for "MRL fixation in Tea" instead of Variants.

In adopting the report of the WG, the Group agreed to continue the activities outlined in the work plan.

In the Intersessional meeting held on 21-22 June 2019 in Sochi, Russia, the group examined the progress made since the 23rd session held at Hangzhou, China on 17-20 May 2018, reviewed the priority list, recommended to continue the activities defined in the work plan and proposed the following future work plan:

1. Continue data generation and submission for realistic MRL fixation in tea.
2. Share available data from different producing countries for MRL fixation for L-cyhalothrin & propiconazole and submit dossier for JMPR evaluation in 2019.
3. Continue work on contaminants and emerging challenges.
4. Communication plan for effective dissemination of information on change of regulations & engaging manufacturer's support for data submission.
5. Consider developing Analytical Hub for providing laboratory support.
6. Sharing information on development of pest resistance.
7. Roadmap for on the recommendation that the mandate of the WG be expanded to address the question of how to establish MRLs in countries where gaps exist [a roadmap on the necessary steps to enable this process will be developed, to ensure correct representation to the relevant bodies].
8. Build relationships with regional chemical manufacturers umbrella organisations in order to facilitate the establishment of import tolerances. The first step being to map out the relevant organisations in each region and develop a communication "lines to take" for a consistent industry approach.
9. To assist THIE in discussions with the EU Commission on folpet/phthalimide the group agreed to:

   -share available investigative data and insights on the formation/sources of phthalimide in tea; and

   -all producing countries to provide a statement regarding non-use and/or non-authorisation of the compounds folpet, phosmet and captan for tea.

In the Intersessional meeting held on 23rd February 2022 (Virtual), The working group on MRLs discussed in details and decided the following:

1. The Group will establish contacts with the European Commission Directorate-General for trade to address issues arising from the pace of change in the EU MRLs regulations, as part of its efforts to raise awareness about its work and to contribute towards building a sustainable tea trade. It was brought to the attention of the Members that the Committee on Sanitary and Phytosanitary (SPS) of the WTO will hold a thematic session in March 2022 on trade facilitative approaches to MRLs. The outcome of this meeting may have tangible implications on the activities and objectives of the working group.

2. The Group will organize a webinar towards the end of March 2022 to present a study prepared for the FAO IGG/Tea by the Max-Planck-Institute of Meteorology on the effects of anthraquinone contamination on tea production systems.

3. In light of the emergence of frequent cases of pest resistance, producing countries are invited to share relevant information on plant protection with Dr K. Yoshida for compilation for the Group. A specific format for submitting the data is being provided to Members.

4. The Group will prepare a joint submission to JMPR for L-Cyhalothrin and Propiconazole where sufficient field trials exist among producing countries for fixation of MRLs in tea.

5. Information on data generation and submission to national Codex points/national regulators will be shared with the members. The priority list will be updated by mid-May, allowing members sufficient time to provide adequate information.

6. In view of emerging concerns associated with the detection of residues, such as Folpet/Phthalimide and Trimesium, that may not arise from the use of pesticides, it is suggested that the mandate of the working group be expanded to carry out targeted studies aimed at identifying the sources of these detections and generate occurrence data for setting limits.

II. FAO Funded Project on Atmospheric Modelling of Anthraquinone and its Impact on Tea Production Systems

1. The presence of Anthraquinone in tea has been a topic of concern and discussion within the FAO-IGG on tea WG on pesticides for a number of years. In particular, the findings from various industry studies that the environment could be a significant source of the contamination on tea which would be outside the control of the tea industry to eliminate.

2. The WG on MRLs agreed to submit a project proposal proposed by THIE to FAO-IGG in 2019 to provide a deeper understanding of the environmental sources of Anthraquinone beyond the tea plantations and factories.

3. On this basis, the Secretariat of FAO IGG on Tea contracted a project with the Max-Planck Institute for Meteorology to study the effects of Anthraquinone contamination on tea production systems. Specifically, the Max-Planck team was tasked to look at the possible contamination of tea leaves resulting from the deposition of atmospheric Anthraquinone using a global chemical transport model. This model accounts for the emission, atmospheric transport, chemical transformation, and deposition of Anthraquinone onto surfaces.

4. The project was completed in 2020 and confirmed that anthropogenic activities and atmospheric weather patterns could be a significant source of the Anthraquinone that is found in tea. A webinar for FAO-IGG members was held on 31st March 2022 where the study leads Prof. Guy Brasseur and Dr Kathy Li shared the findings and answered members questions. The webinar was recorded and shared with UK regulators and the EU Commission.

5. A scientific paper was subsequently prepared and published in the open access journal Ambio in April 2023. The reference for the paper is Li, C.W.Y., Walters, S., Müller, JF. *et al.* Contamination of tea leaves by Anthraquinone: The atmosphere as a possible source. *Ambio* **52**, 1373–1388 (2023). https://doi.org/10.1007/s13280-023-01858-9

III. Progress made since last Intersessional meeting held on 23rd February 2022 (Virtual)

The progress made since the last meeting is presented in this report under each objective/work plan.

1. Data generation and submission through national Codex points/national regulators for MRL fixation

Codex

Four further CXLs have been approved for tea, green and black (DT1114) in the period 2022-2023. These are: Difenaconazole 20 mg/kg, fenbuconazole 30 mg/kg, methoxyfenozide 80 mg/kg and spinetoram 70 mg/kg. This brings the total number of CXLs for tea under the DT1114 code to 29.

It should also be noted that the CCPR54 report recommended the deletion of the CXL for Methidathion in tea (CXL 0.5 mg/kg).

India

During this period, data on Flupyradifuron, Spirotetramat, Betacyfluthrin + Imidacloprid, Emamectin Benzoate + Lufenuron, Tetraniliprole + Spirotetramat have been submitted to manufacturer for Label claim as well as FSSAI MRL fixation in tea following brew factor based risk assessment.

Proposed MRLs based on data & risk assessment

Multilocational Supervised field trial data was submitted for FSSAI MRL fixation.

a) Data accepted by FSSAI and MRL revised for following 5 pesticides:

I. Emamectin Benzoate –Proposed & Revised MRL 0.06 mg/kg
II. Fenpyroximate –-Proposed & Revised MRL 6 mg/kg
III. Hexaconazole –- Proposed & Revised MRL 5 mg/kg
IV. Propiconazole –- Proposed & Revised MRL 6 mg/kg
V. Quinalphos –- Proposed & Revised MRL 0.7 mg/kg

b) Data submitted for following 7 pesticides and under review:

I. Cyflumetofen - Proposed MRL 6.0 mg/kg
II. Pyridaben - Proposed MRL 0.8 mg/kg
III. Thiamethoxam - Proposed MRL 10 mg/kg
IV. Clothianidin - Proposed MRL 5 mg/kg
V. Flubendiamide - Proposed MRL 15 mg/kg
VI. Flupyradifuron- Proposed MRL 30 mg/kg
VII. Spirotetramat- Proposed MRL 4 mg/kg

2. Notification of new MRLs in Tea

India

The Food safety and Standard Authority of India (FSSAI) through The Gazette of India Notification Extraordinary Part-III, Section 4.No. 537 dated 24 Dec 2018 (effective 3rd January 2019) updated its MRL in many food commodities including Tea. This standard known as Food Safety and Standards (Contaminants, toxins and Residues) Third Amendment Regulations, 2018 has adopted Codex MRL for a number of pesticides in tea in India as Codex MRLs have been fixed after risk assessment globally. This attempt of aligning the Indian Standards with Codex will certainly help in ensuring smooth tea trade globally and is a step towards harmonization. MRLs of 5 molecules were revised upward vide Notification No. F.No. SS-T00d/SP-02/SOP-MRLs/2021-22) dated 27.04.2023.

- **The status of current MRLs in tea is shown below:**

Sl No.	Pesticides	FSSAI MRLs (mg/kg) in tea
1.	Bifenthrin	30
2.	Bitertanol	0.05*
3.	Carbendazim	0.5
4.	Carfentrazone Ethyl	0.02*
5.	Cyflumetofen	0.05*
6.	Chlorpyriphos	2

7.	Chlothianidin	0.7
8.	Deltamethrin	5
9.	Dicofol	40
10.	Emamactin benzoate	0.06
11.	Ethion	5
12.	Etoxazole	15
13.	Fenazaquin	3
14.	Fenpropathrin	2
15.	Fenpyroximate	6.0
16.	Flubendiamide	50
17.	Fluvalinate	0.01*
18.	Glufosinate ammonium	0.01
19.	Glyphosate	1
20.	Hexaconazole	5.0
21.	Hexythiazox	15
22.	L-cyhalothrin	0.05*
23.	Mancozeb	3
24.	Oxyfluorfen	0.2
25.	Paraquat dichlorice	0.2
26.	Propargite	10
27.	Propiconazole	6.0
28.	Quinalphos	0.7
29.	Spiromesifen	70
30.	Thiacloprid	5
31.	Thiamethoxam	20
32.	Zineb as CS2	0.1
33.	2,4-D Amine salt	0.05*

[Note: *Limit of Quantification (LOQ)]

- Further, directives were also issued to FSSAI labs in India to test additional 20 banned pesticides with the default MRL of 0.01 mg/kg (with the exception of 0.05 mg/kg for DDT) vide Notification No. F.No. QA/3/2021/FSSAI-Part (3) dated 29.11.2023 as shown below:

Sl No.	**Banned Pesticides**	**Default MRL (mg/kg)***
1.	Carbofuran	0.01
2.	Methomyl	0.01
3.	Monocrotophos	0.01
4.	Phosphamidon	0.01
5.	Simazine	0.01
6.	Aldrin (sum of Aldrin &Dieldrin)	0.01
7.	Chlordane(Sum of isomers)	0.01
8.	D.D.T (Sum of p,p'-DDT, o,p'-DDT, p,p'-DDE, o,p'-DDE, p,p' -DDD and o,p'-DDE)	0.05
9.	Diazinon	0.01
10.	Endosulfan (Sum of alpha endosulfan, beta endosulfan and endosulfansulphate)	0.01
11.	Fenitrothion	0.01

12.	Heptachlor (sum of heptachlor & heptachlor epoxide)	0.01
13.	HCH(Sum of alpha, beta, gama& delta(HCH)	0.01
14.	Aldicarb	0.01
15.	Captafol	0.01
16.	Ferbam	0.01
17.	Formothion	0.01
18.	Fenthion	0.01
19.	Methyl Parathion	0.01
20.	Ethyl Parathion	0.01

- **<u>Additional developments in India</u>**

- Mandatory biannual testing and uploading the test report on the FoSCoS (Food Safety Compliance system) portal by the FBOs vide 15(31) 2020/FoSCos/RCD/FSSAIpt1-Part (1) dated 13.01.2023.
- Guidance Document & Standard Operating Procedures for fixation of Maximum Residue Limits (MRLs) of pesticides in food commodities (F.No. Std/SP-02/SOP-MRLs/2021-22) dated 16.03.2022 stated:

  "Beverages such as tea and coffee are consumed in the form of water infusions of the prepared leaves or seed as the case may be, and the most relevant part consumed is the perfusate or infusion. The RAC in case of tea refers to the "made tea" i.e, processed, fermented and graded dry leaves and the MRLs for processed tea are calculated on the basis of pesticide residue in the infusion obtained by following a standard procedure for preparation of the perfusate."

  -As per the Guidance document the MRL in tea in India will be fixed on risk assessment using brew factor or processing factor. For doing so residues will be determined on both Made tea and infusion following standard procedure. For MRL compliance the residue will be checked in made tea, the traded commodity.
- Policy on usage of Plant Protection Formulations in Tea Plantations of India- Plant Protection Code Version 15.0 released on May 2023.
- Along with Captafol, Tetrahydrothalimide (THPI) will also be monitored.
- Tea Authenticity study was also undertaken to develop a suitable protocol in order to authenticate the Region Specific India origin tea like Darjeeling tea, Assam tea, etc.

Sri Lanka

Sri Lanka continued strict regulations on safe and rational Plant Protection Products (PPPs) / pesticide use in tea cultivation having paid much attention to the periodical changes to meet the requirements of consumers, social and environmental acceptance etc. ensuring meeting the pesticide residues in made tea at levels below the Maximum Residue Limits (MRLs) set for different pesticides by different countries. Accordingly, the Tea Research Institute of Sri Lanka (TRI) revised the PU 1 – PU 4 Advisory Circulars as at March 2023 with the recommended chemical list of 27 Nos. for the Sri Lanka Tea Board (SLTB) to regularly monitor tea exports for pesticide residues through accredited laboratories ensuring export requirements.

Withdrawal of Agrochemical restrictions:
The Gazette Extraordinary of the Democratic Socialist Republic of Sri Lanka dated 29.07.2021 on the 'Presidential Task Force for the creation of a Green Socio- economy with Sustainable Solutions' restricting importation and use of synthetic and mineral sources of fertilizers and pesticides in agriculture was relaxed. While the R&D interventions focusing on technically based non-chemical measures for the tea sector in view of sustainable pest, disease and weed management etc. continued, rational use of PPPs as per the PU 1 was promoted.

Mitigation of Glyphosate and MCPA residues:
TRISL released the recommendation of RAPID, the hybrid herbicide with Glyphosate and MCPA molecules as a remedy to detections of Glyphosate and MCPA residues with proven guarantee of Glyphosate and MCPA residues below the set MRLs in Japan and the EU.

Alleged detections of residues of unintended chemical compounds in made teas:
Despite continuous monitoring and vigilance to maintain Sri Lanka's reputation for producing safe and quality tea with least MRLs, occasional detections of residues of unintended chemical compounds in single origin teas with unrealistic levels i.e. Anthraquinone, Salicylic acid, Pyrrolizidine Alkaloids, Pentachlorophenol (PCP), Perchlorate and Trimethylsulfonium cation. Thus, TRISL and SLTB continued formal agrochemical audits to review such alleged chemical detections and make appropriate remedies to the garden marks and / or tea factories.

Major constraints, challenges and lessons:
Sri Lanka has no objection in connection with the chemicals listed with MRLs under Tea Association of the USA i. e. Chlorantraniliprole, Flubendiamide, Glufosinate -Ammonium, Glyphosate and MCPA as they are within the TRISL recommendations on doses, timing and PHIs assuring the compliance.

Sri Lanka however faced practical issues in connection with certain agrochemical usage in force for Rain Forest Alliance (RA) certification which might be the concern for other producing countries as well.

In view of assuring safe and rational use of agro chemicals, Sri Lanka initiated GAP certification criteria for tea with the support from the FAO and technical material for record keeping and monitoring from the TRISL.

China

As the issue of new regulations, the full list of tolerance limits in tea in China is as follows:

Pesticide	**MRLs**	Pesticide	**MRLs**
2,3,6-TBA	0.01*	Fenobucarb	0.05
2,4-dichlorophenyl	0.01*	fenpropathrin	5
Acephate	0.05	fenvalerate and	0.1
Acequincyl	0.01	flucythrinate	20
Acetamiprid	10	flufenoxuron	20
Atrazine	0.1	fluorodifen	0.05*
Azadirachtin	1	fluoroitrofen	0.01*
Bentazone	0.1*	glufosinate-ammonium	0.5*

bifenthrin	5	glyphosate	1
binapacryl	0.05*	HCH	0.2
buprofezin	10	heptenophos	0.01*
carbaryl	5	hexachlorophene	0.01*
carbendazim	5	hexythiazox	15
carbofuran	0.02	hydroprene	0.01*
carbosulfan	0.01	imidacloprid	0.5
Cartap	20	imidaclothiz	3*
chlorfenapyr	20	indanofan	0.01*
chlorfenvinphos	0.01	indoxacarb	5
chlornitrofen	0.01*	isazofos	0.01
chlorobenzilate	0.05	isocarbophos	0.05
chloroneb	0.05	isofenphos-methyl	0.01*
chloropropylate	0.02*	ivermectin	0.2
chlorothalonil	10	kinoprene	0.01*
chlorpyrifos	2	Malathion	0.5
chlorsufuron	0.02	methamidophos	0.05
chlorthal	0.01*	methidathion	0.05
chlorthal-dimethyl	0.01	methomyl	0.2
clothianidin	10	methoxychlor	0.01
crotoxyphos	0.05*	methyl bromide	0.02*
cycloprate	0.01*	metsulfuron-methyl	0.02
cyfluthrin and beta-cyfluthrin	1	mevinphos	0.05
cyhalothrin and lambda-	15	naled	0.01*
cypermethrin and beta-	20	nitenpyram	1
dalapon	0.01*	omethoate	0.05
DDT	0.2	paraquat	0.2
deltamethrin	10	parathion-methyl	0.02
demeton	0.05	permethrin	20
diafenthiuron	5	phorate	0.01
dicofol	0.01	phosfolan	0.03
difenoconazole	10	phosfolan-methyl	0.03*
diflubenzuron	20	phoxim	0.2
dimethoate	0.05	picoxystrobin	20
Dinex	0.01*	profenofos	0.5
Dinosam	0.01*	pymetrozine	2
dinotefuran	20	pyraclostrobin	10
Dinoterb	0.01*	pyridaben	5
emamectin benzoate	0.5	simazine	0.05
endosulfan	10	terbufos	0.01*
Erbon	0.05*	tetrachlorvinphos	0.01

ethametsulfuron	0.02	thiacloprid	10
ethoprophos	0.05	thiamethoxam	10
etofenprox	50	tolfenpyrad	50
Etoxazole	15	trichlorfon	2
Fenazaquin	15	tridiphane	0.05*
Fenitrothion	0.5	Zineb	50

[Note: * temporary MRLs]

3. Collection of data on pest resistance to plant protection products [*Japan is coordinating this activity*]:

Cases of resistance development by red spider mites and tea mosquito bug have been studied in details in North East Indian tea pest. Data will be presented in the format provided by Japan.

A call for data on pest resistance to plant protection products was circulated to members on the 18th Feb 2022. To date information has been provided by Kenya, India, Argentina and Japan.

4. To prepare joint dossiers for submission to JMPR for L-cyhalothrin and Propiconazole:

Two compounds identified in the last meeting were L-cyhalothrin and Propiconazole for preparation of dossier as per JMPR format. Currently India has 4 location residue data for Propiconazole and 2 locations data for L- Cyhalothrin. Sri Lanka has 8 field trials data for propiconazole (as per priority list) Dossiers can be prepared if additional data is obtained from other tea producing countries. Further using ***Proportionality Factor*** and ***Data scaling*** approach the older trial data carried out with doses different than GAP dose (recommended rates) the problem of insufficient trial data can be addressed. Members may deliberate on this proposal.

5. A review of the priority list of compounds:

Members agreed to notify the Chairpersons of compounds that are no longer relevant for their country and propose new compounds which should be considered for addition to the priority list.

A call for data on priority pesticide compounds was circulated to members on the 18th Feb 2022. To date information has been provided by Kenya, India and Argentina. The current priority list of compounds below will be reviewed by the working group once the data collection exercise is completed.

The list is based on new information on risk assessment, or replacements or potential use in tea.

Priority list of chemicals (to be updated on inputs from members)

Pesticides	**Data Availability**	**No of trials and Country**	**Data submitted to Codex and date**
2,4-D	Limited	1 (India)	-

Abamectin	No		
Acephate			
Acequinocyl	In progress	4 (Japan) 4 (Argentina)	
Acetamiprid	Yes	4 (Japan) 4 (India) 8 (China)	India (2016)
Azoxystrobin	Yes	4 (Japan)	
Bitertanol	Yes	8 (Sri Lanka)	Not submitted
Buprofezin	Submitted to EU#	6 (Japan)	30 (codex, Green Tea)
Carboxim	To be done		
Chlofentezine		2 (Japan)	
Chlorfluazuron	Yes	8 (Sri Lanka) 2 (Japan)	Not submitted
Chlorothalonil		2 (Japan)	
Chlorpyrifos	Yes	2 (Japan) 6 (India)	2 (2005) India
Chromafenozide	Limited	2 (Japan)	
Copper hydroxide	Yes	2 (India), not required in Japan	
Copper oxide	No		
Copper Oxychloride	Yes	8 (Sri Lanka) 4 (Japan) 2 (India)	Joint Application with India
Dichorvos	No		
Difenoconazol	Limited	2 (Japan)	
Dimethoate	Limited	4 (India)	India (2016)
Dinitrofuran			
Diuron	In progress	Not registered in Japan	
Emamectin Benzoate	Yes	2 (Japan) 4 (India)	
Ethion	Yes	12 (India)	India (2016)
Fipronil	Yes	8 (Sri Lanka)	Not submitted
Flupyradifuron	Yes	4 (India)	
Glufosinate-ammonium	Limited	Not registered in Japan	
Glyphosate	Yes	2 (Japan)	
Hexaconazole	Yes	8 (Sri Lanka) 4 (India)	India (2016)
Indaziflam	Yes	4 (India)	
MCPA	Yes	8 (Sri Lanka)	Not submitted
Metolachlor			
Milbemectin	No	2(Japan)	
Novaluron	No		
Oxyfluorfen	In progress	1 (India)	

Polysulphide sulphur	Exempted		
Propiconazole	Yes	8 (Sri Lanka) 4 (India)	India (2016)
Spirotetramat	Yes	4 (India)	
Streptomycin	Yes	4 (India)	
Tebuconazole	Yes	4 (Sri Lanka) 2 (Japan)	
Thiacloprid	Yes	4 (Japan) 2 (India) 8 (Registrant)	
Thiophanate-methyl	To be done	2 (Japan)	
Tolfenpyrad	Available	8(China)	30 (Codex, Green Tea, 8 Trials China)
Trifloxystrobin	To be done	3 (Japan)	
λ-Cyhalothrin	Yes	2(Japan) 2 (India)	India (2016)

6. Multiple Source Compounds and other Contaminants of Interest

- **Anthraquinone:**

Based on the study conducted by the Tea Research Association (TRA), Tocklai, India in 2015 as well as subsequent studies at the behest of UKTIA and the Group, it can be concluded that natural occurrence as well as atmospheric or environmental deposition has been the major source of Anthraquinone in tea and also this chemical has never been registered, used, or monitored in India as pesticide. So, EU may be requested to drop this from the list of pesticides to be monitored for tea samples.

Anthraquinone has been classified by the European Chemical Agency (ECA) as a class 1B carcinogen. This explains why this category is presumed to have carcinogenic potential for humans. Classification is largely based on animal evidence, not human beings. Whereas, this same chemical has been categorized by the International Agency for Research on Cancer (IARC), WHO as class 2B which means possibly carcinogenic to humans. This implies more data and studies on the impact on humans are required.

THIE highlight that the EU Reference Laboratory (EURL) has published an improved method to analyse anthraquinone in tea at an LOQ of 0.005 mg/kg https://www.eurl-pesticides.eu/docs/public/tmplt_article.asp?CntID=1167&LabID=500&Lang=EN This involves the risk of a further decrease of the EU MRL of currently 0.02* mg/kg. A decrease of this MRL would lead to a high incompliance rate of tea samples according to THIE monitoring data. Due to the wildfires in the northern hemisphere last summer (e.g. Canada) we expect even higher anthraquinone levels in the products than calculated in the study of the Max-Planck-Institute (MPI). Accordingly, the anthraquinone study of the MPI an important module in the THIE strategy vis-à-vis the European legislator.

China shared details of 3 research papers of studies conducted on anthraquinone/ anthracene.

9,10-Anthraquinone deposit in tea plantation might be one of the reasons for contamination in tea
Xuan Wang, Li Zhou, Fengjian Luo, Xinzhong Zhang, Hezhi Sun, Mei Yang, Zhengyun Lou, Zongmao Chen. Food Chemistry 244 (2018) 254–259
http://dx.doi.org/10.1016/j.foodchem.2017.09.123

Uptake, translocation, and metabolism of anthracene in tea plants
Mei Yang, Fengjian Luo, Xinzhong Zhang, Xinru Wang, Hezhi Sun, Zhengyun Lou, Li Zhou, Zongmao Chen. Science of the Total Environment 821 (2022) 152905
http://dx.doi.org/10.1016/j.scitotenv.2021.152905

9,10-Anthraquinone contamination in tea processing using coal as heat source
Jiawei Yu, Li Zhou, Xuan Wang, Mei Yang, Hezhi Sun, Xinru Wang, Fengjian Luo, Xinzhong Zhang, Zhengyun Lou, and Zongmao Chen. Beverage Plant Research 2022, 2: 8
https://doi.org/10.48130/BPR-2022-0008

- **Nicotine**

In the latest communication, the EU mentioned that "EFSA performed a new acute dietary risk assessment for nicotine in teas excluding the controversial consumption data and concluded that the current MRL of nicotine in teas is safe for consumers." So based on this outcome the temporary MRL of 0.6 mg/kg for nicotine in tea was lowered to 0.5 mg/kg by EU Regulation 2023/136 and applies from 15/09/2023. THIE provided supporting material to go for an extension of this temporary MRL.

Moreover, as per the data presented by the Faculty of Agriculture, Japan (Quantitative Validation of Nicotine Production in Tea — by Ikka T., Yamashita H., Kurita L, Tanaka Y., Taniguchi F., Ogino A., et al., 2018), it is transpired that the black tea contains naturally occurring Nicotine which ranged between 00.02 mg/kg to 00.69 mg/kg. In association with THIE, Tea Research Association (TRA) has earlier studied the possible sources of Nicotine in tea cultivars in field and during processing in 2014 at Tocklai. Tocklai studies has also indicated the amplification of PMT genes in extreme China, extreme Assam, and few cultivated as well as wild tea plants. TRA is also generating systematic data on Nicotine occurrence in tea as well as EU collating the monitoring data on nicotine. Within a couple of years, both data sets will be available for scientific scrutiny and a fresh round of risk assessment.

This further scientific evidence will be helpful for lobbying to the EU Commission. As can be seen from the explanatory note in Regulation (EU) 2023/1536, the scientific evidence currently available is not regarded sufficient to identify the source for the presence of the substance in tea: "Scientific evidence is not conclusive to demonstrate that nicotine occurs naturally in the concerned crop and to elucidate its mechanism of formation. Temporary MRL valid until 22 February 2026. After this date the MRL will be 0.4 mg/kg unless further modified by a Regulation in light of new information provided by 30 June 2025 at the latest." THIE has shared its monitoring data with the EU Commission and could avoid a further decrease at the moment; it will continue its efforts and provide the necessary information on nicotine levels in the products before 30th of June, 2025. The target is to avoid a further decrease to 0.4 mg/kg which would discriminate Indian teas in practice as they show higher nicotine levels compared to other origins.

- **Ethylene oxide (ETO) and its metabolite 2 Chloroethanol (2 CE)**

In late August 2020, Belgium initiated a RASFF notification concerning residues of the unauthorized substance ethylene oxide (ETO) in various lots of sesame seeds from India at levels up to 186 mg/kg. Until 20 November 2020, roughly 140 notifications concerning ETO in sesame from India were notified within the RASFF portal with two of them being border rejections. These notifications originated from 17 different EU-Member states and 2 EFTA countries. The ETO-levels encountered in the sesame samples mostly ranged between 0.1 and 10 mg/kg, all exceeding the EU-MRL (maximum residue limit) of 0.05 mg/kg. Current EU MRL on tea for ETO is 0.1 ppm.

ETO is one of the most widely produced chemicals worldwide. It is mainly used as a chemical intermediate in the manufacture of numerous important chemicals. Only 0.05% of the global ETO production is used for fumigation purposes including the sterilization of medical equipment and the control of insects and microorganisms (fungi and bacteria) in dry food products. Currently we don't have any occurrence or monitoring data on tea.

- **Other**

Tea & Herbal Infusions Europe (THIE) is currently trying to make EU authorities change different inappropriate MRL definitions which have a severe impact on tea as detection of residues of Folpet/Phthalimide, and Trimesium may not arise from use of pesticide(s). Recent studies (https://www.sciencedirect.com/science/article/abs/pii/S0308814621025504?via%3Dihub) calls for a deeper look into the tea plants itself.

China have published 2 papers on perchlorate and phthalimide in tea. The references to the papers are:
Concentrations, generation and risk characterization of phthalimide in tea-derived from folpet or not? Hezhi Sun, Xinzhong Zhang, Wenjing Zuo, Zhongyang Dai, Li Zhou, Fengjian Luo, Mei Yang, Xinru Wang, Zhengyun Lou, Zongmao Chen. Science of the Total Environment 852 (2022) 158194
http://dx.doi.org/10.1016/j.scitotenv.2022.158194

Uptake, Accumulation, Translocation, and Subcellular Distribution of Perchlorate in Tea (Camellia sinensis L.) Plants Yabo Liang, Li Zhou, Xinzhong Zhang, Huan Yu, Mingming Guo, Jiawei Yu, Xinru Wang, Mei Yang, Zhengyun Lou, Fengjian Luo, Hezhi Sun and Zongmao Chen
Cite This: J. Agric. Food Chem. 2021, 69, 4655−4662
https://doi.org/10.1021/acs.jafc.1c01270

7. 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).

EU

1. The current EU MRL status:

The current EU MRLs in tea can be downloaded from the EU pesticides database (food products) https://ec.europa.eu/food/plant/pesticides/eu-pesticides-database/start/screen/mrls, search for "Teas" (Code No. 0610000) in the products tree and the current list of MRLs for tea (Camellia sinensis) will be generated.

2. EU Green Deal

The EU Green Deal https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en which has an impact on pesticide legislation in the EU and will have an even bigger impact in the future. Worth noting that the 'Sustainable Use Regulation' which aimed to reduce the use and risk of pesticides by at least 50% by 2030, and the use of more hazardous chemicals by 65% by the same date, failed to pass the EU Parliament Plenary Vote in November 2023. The environmental aspects needs to be taken into account while assessing requests for import tolerances for pesticide substances no longer approved in the EU. While respecting WTO standards and obligations. Environmental issues emerged as major drivers as EU is currently lowering all MRLs for neonicotinoids to 0.01 mg/kg or the LOD.

The matter of concern is the pace of change of EU MRLs downwards as it will adversely affect the global tea trade to Europe. This necessitates effective sharing of information and data generated scientifically to address the gap and look for viable alternatives that may require time and effective engagement with EU. The THIE Political Statement regarding pesticides legislation is available at https://thie-online.eu/activities/green-deal.html

UK

The UK now has its own GB MRL register which can be found at https://secure.pesticides.gov.uk/mrls/search. Changes in GB MRLs will be notified to WTO. The UK CRD will review and adopt where appropriate CODEX CXLs. Alternatively, a separate import tolerance request is required for consideration of new MRLs for tea.

From the time that the UK left the EU divergence in MRLs for tea from the EU has occurred, and at present there are more than 40 differences in MRLs that the UKTIA has identified. In some cases, the MRLs are significantly lower than the EU MRL e.g. Flubendiamide – 50 mg/kg (EU) and 0.02 mg/kg (GB) and as noted above, an import tolerance application is in progress.

USA

Five new MRLs have been adopted for tea by the US EPA: MCPA 0.3 mg/kg, pyflubumide 80 mg/kg, trifloxystrobin 5 mg/kg, trifluralin 0.05 mg/kg and cypermethrin 15 mg/kg.

There are also several petitions proposing new or amended MRLs: Kasugamycin 3 mg/kg, glufosinate-ammonium 0.5 mg/kg, tetraniliprole 80 mg/kg.

A petition was also filed by EPA to revoke all tolerances for Dicofol in October 2023.

Canada

Three MRLs for tea have been adopted in Canada since the last meeting: glufosinate-ammonium 0.5 mg/kg, hexythiazox 15 mg/kg and pyrifluquizanon 20 mg/kg.

Australia

The 2022 MRL Harmonisation Proposal M1021 has reached the final stages. Gazettal of the M1021 changes is anticipated in March 2024. The changes anticipated for tea are the deletion of the MRL for chlorpyrifos in tea (currently 2 mg/kg), the adoption of the Codex CXLs for difenoconazole (20 mg/kg), fenbuconazole (20 mg/kg), methoxyfenozide (80 mg/kg) and spinetoram (70 mg/kg). A reduction of the MRL for diquat from the temporary MRL of 0.5 to 0.1 mg/kg is also proposed.

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

Comparison of MRLs of a few pesticides in tea fixed by CODEX & other countries

Sl. No.	Pesticides	CODEX MRL (mg/kg)	EU MRL (mg/kg)	USA (mg/kg)	Canada (mg/kg)	Australia (mg/kg)	Japan (mg/kg)	India (mg/kg)	China (mg/Kg)	UK (mg/Kg)	Russia (mg/Kg)
1	Acetamiprid	-	0.05*	50	-		30	-	-	0.05*	
2	Azoxystrobin	-	0.05*	20	20	20(T)	10	-	-	0.05*	
3	Bifenthrin	30	30	30	30	5	30	30	5	30	
4	Bitertanol	-	0.05*	-	-		0.1	0.05*	-	0.05*	
5	Boscalid	40	40	70	-	40	60	-	-	40	
6	Buprofezin	30 (Green)	0.05*	20	30		30	-	10	0.05*	
7	Carbendazim	-	0.1*	-	-		10	0.5	5	0.1*	
8	Carfentrazone Ethyl	-	0.1*	0.1	-		0.1	0.02*	-	0.02*	
9	Chlorfenapyr	60	50	70	70	60	40	-	-	50	
10	Chlorpyrifos	2	0.01*	-	-	2	10	2	-	0.01*	2.0
11	Clothianidin	0.7	0.7 (0.05* from 07/03/2026)	70	70	0.7(T)	50	0.7	-	0.7	0.7*
12	Cypermethrin	15	0.5	15	-	0.5	20	-	20	0.5	20
13	Cyclaniliprole	50	0.05*	50	50	50	30	-	-	0.05*	
14	Cyflumetofen	-	0.05*	40	-		40	0.05*	-	-	
15	Deltamethrin	5	5	-	7	5	10	5	10	5	5
16	Dicofol	40	20	50	-	5	3	40	0.2	20	20
17	Difenoconazole	20	0.05*	15	30	0.05*	15	-	10	0.05*	
18	Emamectin Benzoate	-	0.01*	0.5	-	0.02*	0.5	0.06	-	0.02*	
19	Endosulfan	10	30	-	-	10	30	-	10*	30	30
20	Ethion	-	3	-	-	5	0.3	5	-	3	
21	Etoxazole	15	15	15	15	15	15	15	-	15	
22	Fenazaquin	-	9	9			10	3	15	10	
23	Fenbuconazole	30	0.05*	30		0.05*	-	-		0.05*	
24	Fenpropathrin	3	2	2	2	2	25	2	5	2	2
25	Fenpyroximate	8	8	20	44	0.1	40	6	8	8	
26	Flubendiamide	50	50	50	50	0.02	50	50	-	0.02*	
27	Flufenoxuron	20	15	-	-		15	-	-	15	
28	Fluvalinate	-	0.05*	-	-		10	0.01*	-	0.01*	

29	Glufosinate ammonium	-	0.1*	-	0.5	0.05*	0.3	0.01	0.5	0.1*	
30	Glyphosate	-	2	1	-	20(T)	1	1	1	2	
31	Hexaconazole	-	0.05*	-	-		-	5	-	0.05*	
32	Hexythiazox	15	15	15	15	4	15	15	15	4	
33	Imidacloprid	50	0.05*	-	50	50	10	-	0.5	0.05*	
34	Indoxacarb	5	5	-	-	5	-	-	5	5	
35	L-cyhalothrin	-	0.01*	-	2	1	15	0.05*	15	0.01*	
36	Mancozeb	-	0.1*	-	-		-	3	-	0.1*	
37	Methidathion	0.5	0.1*	-	-		1	-	-	0.1*	0.5*
38	Methoxyfenozide	0.5	80	-	-		70	-	-	80	
39	Oxyfluorfen	-	0.05*	-	-		-	0.2	-	0.05*	
40	Paraquat	0.2	0.05*	-	-		0.3	0.2	-	0.05*	0.2*
41	Permethrin	20	0.1*	20	-	0.1	20	-	20	0.1*	20*
42	Propargite	5	10	10	-		5	10	-	10	5.0*
43	Propiconazole	-	0.05*	4	4		0.1	6	-	0.05*	
44	Pyraclostrobin	6	0.1*	-	-	6	25	-	-	0.1*	
45	Quinalphos	-	0.05*	-	-		0.1	0.7	-	0.05*	
46	Spiromesifen	70	50	40	60	50	30	70	-	50	
47	Spinetoram	70	0.1*	70	-		70	-	-	0.1*	
48	Thiacloprid	-	10	-	-	10	30	5	-	10	
49	Thiamethoxam	20	20 (0.05* from 07/03/2026)	20	-	20	20	20	10	20	
50	Tolfenpyrad	30 (Green)	0.01	30	30		20	-	-	0.05*	
51	Zineb	-	0.01	-	-		-	0.1	-	0.2*	
52	2,4 D	-	0.1*	-	-		-	0.05*	-	0.1*	

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

- **Future action plan**

Following things need to be addressed:

1. Advance Information Sharing mechanism for emerging contaminants for effectively developing testing protocol in producing countries to avoid surprises affecting smooth tea trade.
2. Group to consider lobbying for a review of the pesticide definition to exclude multiple source substances.

3. Regular quarterly on-line meeting of the working group to be scheduled to progress and discuss the work plan.

4. Acceptance of Test reports from the ISO/IEC 17025:2017 compliance accredited labs of producing countries with ILAC MRA recognition for universal acceptance to reduce cost & time.

5. The Group will prepare a joint submission to JMPR for L-Cyhalothrin and Propiconazole where sufficient field trials exist among producing countries for fixation of MRLs in tea.

6. Country wise regulator also need to be sensitized regarding brew factor while calculating MRL and dietary risk assessment as per CCPR Guidance document on risk assessment using brew factor for fixation of MRLs of Pesticides in Tea (CRD 21, 2016) along with Proportionality Approach for assessing different dose residue data as per the JMPR report 2011 (Report No 211 of FAO plant production and Protection paper).

7. Information on data generation and submission to national Codex points/national regulators will be shared with the members. The priority list will be updated as per the inputs from the member countries.

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31 January 2024