
Flavonols/
Catechins
Amino acids
Antioxidants
Volatiles
Pesticide residues
Heavy metals
Additives
Microbes
CEYLON TEA
SYMBOL OF QUALITY

Tea Research Institute of Sri Lanka

Risk of Exceeding Maximum Residue Limits in Made Tea: Impact on Ceylon Tea and Strategies to Minimize Chemical Residues

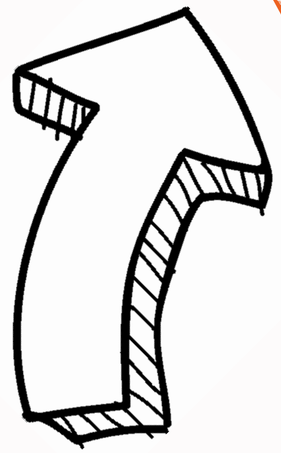
Ganga Sinniah
Head, Plant Pathology Division

Field

Factory

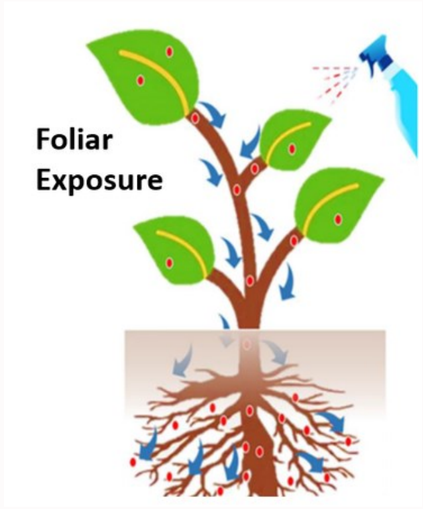
Brokers

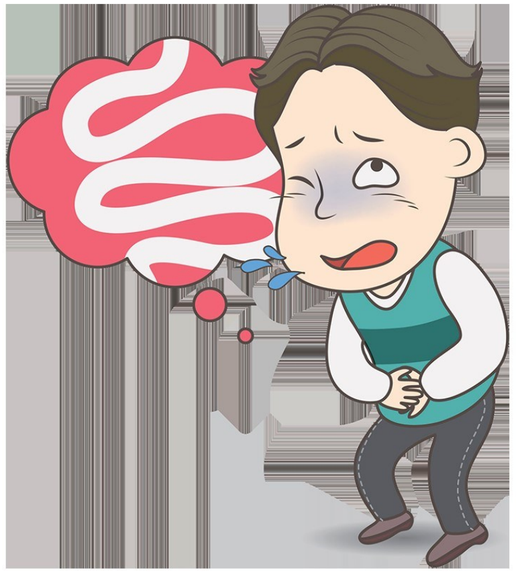
Exporters



Agro - inputs


Soil
Exposure


Foliar
Exposure



Status of Pesticide Residue Detection in Sri Lankan Teas

T.R.I. ADVISORY CIRCULAR

No.PU 1

Serial No. 01/24

Issued in: February 2024

PESTICIDE (PLANT PROTECTION PRODUCT) USE IN TEA

(This Circular supersedes Advisory Circular No. PU 1, Serial Nos. 03/08, 01/12, 01/15, 01/17, 01/18, 01/20, 01/22 and 01/23, issued in October 2008, June 2012, February 2015, February 2017, July 2018, November 2020, August 2022 and March 2023 respectively)

1. Introduction

Diseases, insect, mite and nematode pests and weeds occur in tea, in different stages of the crop, and at different times of the year. Therefore, an integrated approach (Integrated Pest Management (IPM) is recommended for efficient and timely management of pests in tea, which consists of various agronomic, cultural, biological and chemical strategies in a rational and environmental friendly manner. Rational use of fungicides, insecticides, acaricides, nematicides, fumigants and weedicides is a part of integrated management of diseases, insects, mites, nematodes and weeds respectively.

In parallel, it is necessary to strengthen biological systems and improve cultural practices in order to promote the build-up of tolerance in plant and biological-control organisms in the environment, and to prevent the introduction and dissemination of pests, diseases and weeds in tea fields. Also, use of tea cultivars resistant / tolerant to the different diseases and pests is the prime component in the IPM.

As tea is a food commodity for human consumption, there is a growing concern among health-conscious consumers on pesticide residues that may be present in tea.

Therefore, it is advisable to use pesticides in tea fields carefully, in order to minimize the residues in made tea, effects on workers and non-target organisms in the eco-system. Moreover, the cost, effectiveness, and the social acceptance of pesticide usage also have to be considered for the sustainability of the tea industry.

The chemicals and their use in tea as Plant Protection Products (PPPs) are subjected to change periodically to meet the requirements of consumers, social and environmental acceptance etc. It is extremely necessary to ensure that the pesticide residues in made tea at levels below the Maximum Residue Limits (MRLs) set for different pesticides by different countries.

When PPPs are applied to tea cultivations, it is necessary to strictly adhere to specific Pre-Harvest intervals (PHI) and bulk green leaf from the sprayed and unsprayed fields or made tea at a ratio of 1:10. This would help dilute and minimize the pesticide residues in the made tea. Proper record keeping and monitoring on rational use of the PPPs are made mandatory for traceability and regulatory purposes.

2. List of Recommended PPPs

The active substances recommended for control of diseases, insects, mites and nematode pests and weeds in tea plantations by the Tea Research Institute of Sri Lanka, as at March, 2023 and respective MRLs of Japan and the EU are given in the Table 1.

Growers are advised to use only the PPPs listed in Table 1 and as per TRI recommendations given in Advisory Circulars PU 2, PU 3 and PU 4 for management of diseases, weeds and insect, mite and nematode pests respectively

1

Revised Advisory Circulars PU 1

Table 1. List of recommended PPPs by the Tea Research Institute of Sri Lanka

No.	Common name / a.i. (active ingredient)	Type	MRL for made tea (ppm)		TRI Advisory Circular No.
			Japan	E U	
1	Brunolium/Tar Acids	F	Exempted	Exempted	PU2
2	Calcium hydroxide	n/a	Exempted	Exempted*	PU4
3	Chlorantraniliprole	I	50	0.05	PU4
4	Copper hydroxide	F	Exempted	40 (as Cu)	PU2
5	Copper oxide	F	Exempted	40 (as Cu)	PU2
6	Copper sulphate	F	Exempted	40 (as Cu)	PU2
7	Diazinon	I	0.10	0.05	PU4
8	Diuron	W	1	0.01	PU3
9	Emamectin Benzoate	I	0.5	0.01	PU4
10	Fipronil	I	0.002	0.005	PU4
11	Fluopyram	N	-	0.05	PU4
12	Glufosinate ammonium	W	0.30	0.10	PU3
13	Glyphosate	W	1	2	PU3
14	Hexaconazole	F	0.01	0.05	PU2
15	MCPA	W	0.06	0.10	PU3
16	Methyl Isothiocyanate/ Metam	N	0.10	0.05	PU4
17	Oxyfluorfen	W	0.01	0.05	PU3
18	Propiconazole	F	0.10	0.05	PU2
19	Sulphur	A/I	Exempted	Exempted*	PU4
20	Tebuconazole	F	80	0.05	PU2

F - Fungicide; I – Insecticide; A – Acaricide; N - Nematicide; W – Weedicide

n/a – Not applicable

**Annexure IV of EU list where MRLs are not applicable*

Tea Research Institute of Sri Lanka
Talawakelle

TRI Recommended Weedicides: Plucking Fields

- **Diuron (80% WP)**
- **Diuron liquid 50% SC**
- **Glyphosate (36% w/v)**
- **Glufosinate ammonium 28% 280 g / L SL**
- **Glufosinate ammonium 15% 150 g / L SL**
- **MCPA 60%**
- **Glyphosate Isopropyl Amine 29.3% + MCPA Iso propyl Amine 5.8%**

TRI Recommended Pesticides: Plucking Fields

Fungicides

Copper fungicides

TRI Recommended Pesticides: Plucking Fields

Insecticides & miticides

Lime Sulphur

Emamectin benzoate –Proclaim 5 SG

Sulphur 80%

Ants **Diazinon**

Reasons for Pesticide Residues in Tea

- Non-compliance to recommended dosage, dilution & frequency
- Non-compliance to recommended pre-harvest interval
- Use of non-recommended agrochemicals
- Insufficient monitoring
- Lack of communications

How to Manage this Issue?

Stick to TRI Recommendations

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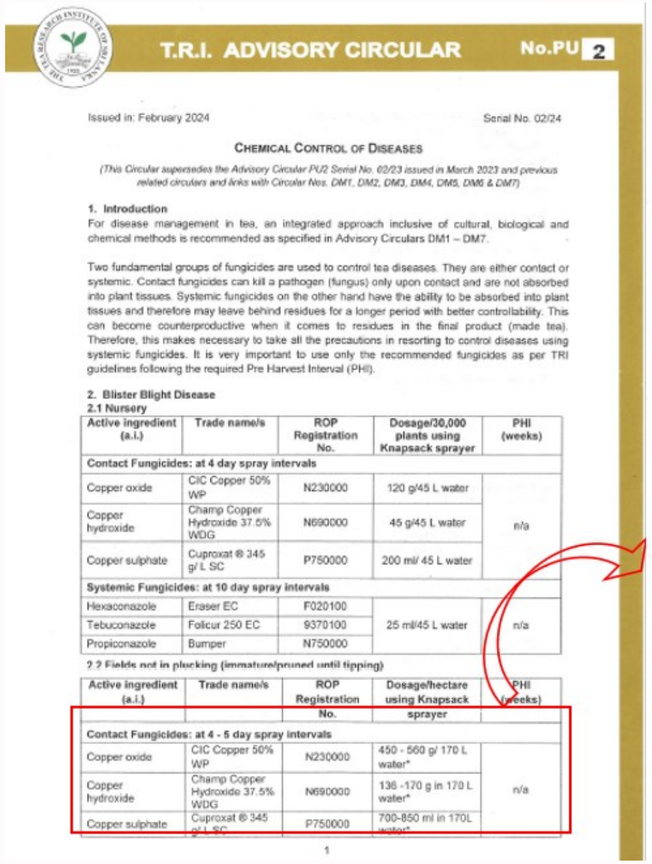
இலங்கை தேயிலை ஆராய்ச்சி நிறுவனம்

TEA RESEARCH INSTITUTE OF SRI LANKA

Revised Advisory Circulars PU 4



T.R.I. ADVISORY CIRCULAR No.PU 2

Issued in: February 2024 Serial No. 02/24

CHEMICAL CONTROL OF DISEASES

(This Circular supersedes the Advisory Circular PU2 Serial No. 02/23 issued in March 2023 and previous related circulars and links with Circular Nos. DM1, DM2, DM3, DM4, DM5, DM6 & DM7)

1. Introduction

For disease management in tea, an integrated approach inclusive of cultural, biological and chemical methods is recommended as specified in Advisory Circulars DM1 – DM7.

Two fundamental groups of fungicides are used to control tea diseases. They are either contact or systemic. Contact fungicides can kill a pathogen (fungus) only upon contact and are not absorbed into plant tissues. Systemic fungicides on the other hand have the ability to be absorbed into plant tissues and therefore may leave behind residues for a longer period with better controllability. This can become counterproductive when it comes to residues in the final product (made tea). Therefore, this makes necessary to take all the precautions in resorting to control diseases using systemic fungicides. It is very important to use only the recommended fungicides as per TRI guidelines following the required Pre Harvest Interval (PHI).

2. Blister Blight Disease

2.1 Nursery

Active ingredient (a.i.)	Trade name/s	ROP Registration No.	Dosage/30,000 plants using Knapsack sprayer	PHI (weeks)
Contact Fungicides: at 4 day spray intervals				
Copper oxide	CIC Copper 50% WP	N230000	120 g/45 L water	n/a
Copper hydroxide	Champ Copper Hydroxide 37.5% WDG	N690000	45 g/45 L water	
Copper sulphate	Cuproxat ® 345 g/ L SC	P750000	200 ml/ 45 L water	
Systemic Fungicides: at 10 day spray intervals				
Hexaconazole	Eraser EC	F020100	25 ml/45 L water	n/a
Tebuconazole	Folicur 250 EC	9370100		
Propiconazole	Bumper	N750000		

2.2 Fields not in plucking (immature/pruned until tipping)

Active ingredient (a.i.)	Trade name/s	ROP Registration No.	Dosage/hectare using Knapsack sprayer	PHI (weeks)
Contact Fungicides: at 4 - 5 day spray intervals				
Copper oxide	CIC Copper 50% WP	N230000	450 - 560 g/ 170 L water*	n/a
Copper hydroxide	Champ Copper Hydroxide 37.5% WDG	N690000	136 -170 g in 170 L water*	
Copper sulphate	Cuproxat ® 345 g/ L SC	P750000	700-850 ml in 170L water*	

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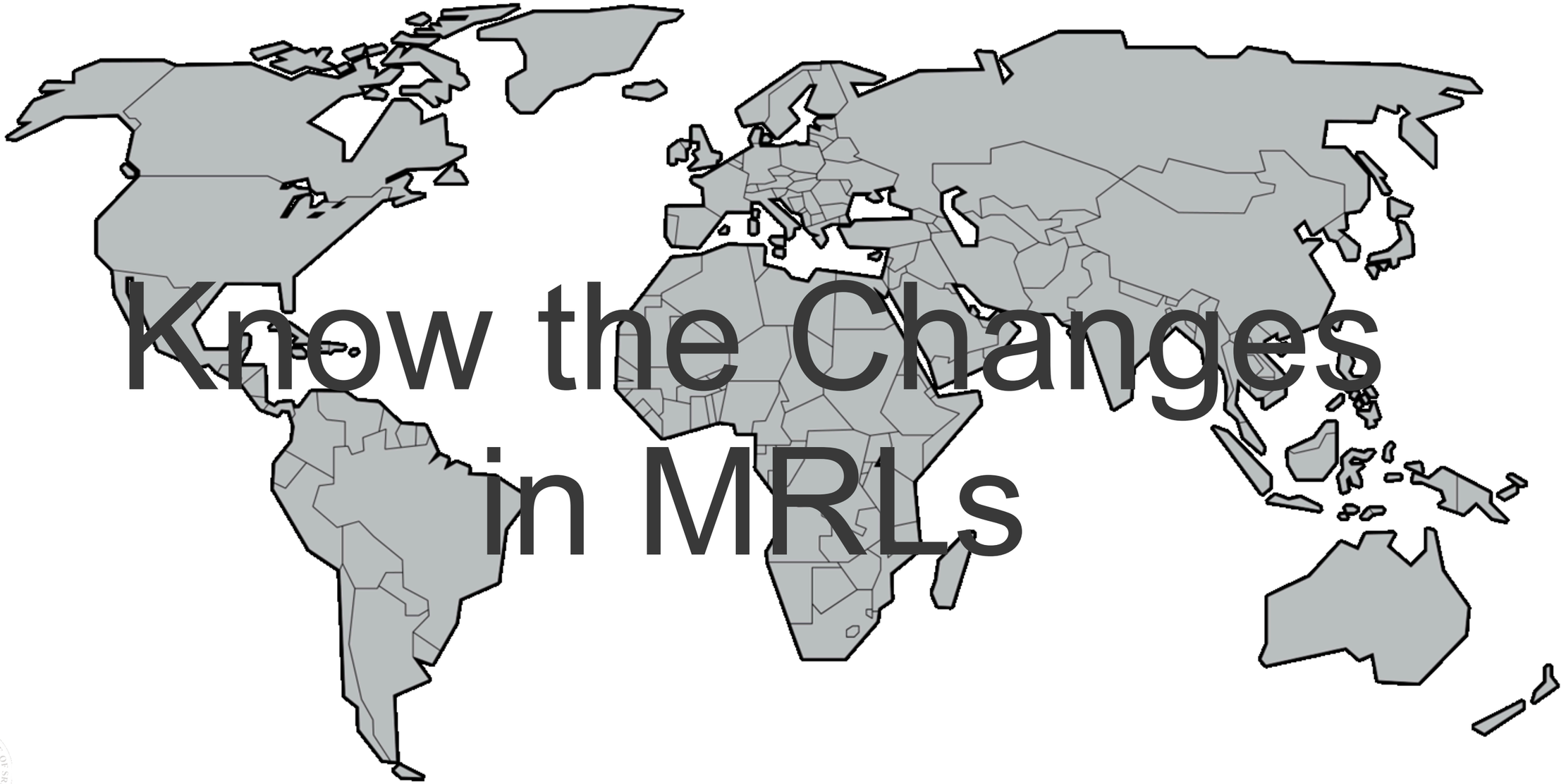
2.3 Plucking fields

Active ingredient (a.i.)	Trade name/s	ROP Registration No.	Dosage/hectare	PHI (weeks)
Contact Fungicides: at 7-10 day spray intervals				
Copper oxide	CIC Copper 50% WP	N230000	280 - 420 g/ 170 L water*	1
Copper hydroxide	Champ Copper Hydroxide 37.5% WDG	N690000	136 -170 g / 170 L water *	
Copper sulphate	Cuproxat ® 345 g/ L SC	P750000	700-850 ml in 170L water	
Systemic Fungicides: Not recommended				

Stick to Pre-harvest Intervals (PHI)

Spraying

Harvesting



Know the Changes in MRLs

Recent Changes of EU MRLs

Tea and Herbal Infusions Europe- Maximum Residue Limits as per EU Legislation

Reference: Regulation No. 396/2005/EC in its current version Commission Regulation (EU) 2023/1783 of 15 September 2023

No.	Common name / a.i. (active ingredient)	Type	E U MRL (ppm)
1	Chlorantraniliprole	Insecticide	0.05 (0.02) ⬆
2	Diuron	Weedicide	0.01 (0.05) ⬇
3	Emamectin Benzoate	Insecticide	0.01 (0.02) ⬇
4	Methyl Isothiocyanate/ Metam	Nematicide	0.05 (0.02) ⬇
5	Propiconazole	Fungicide	0.01 (0.05) ⬆

Use Alternatives and Alternative Strategies

Maintaining Quality of “Pure Ceylon Tea”: Strategies

1.For Glyphosate ----------> Glufosinate Ammonium

- 28% 280g/L SL (Lifeline; Class III product) at 700 ml/ha
- 15% 150g/L SL (Zagro; Class III product) at 1.4L/ha

Herbicide	MRL [ppm] (Japan)	MRL [ppm] (EU)	Test value (ppm)
			7 days
Glufosinate ammonium 28%	0.3	0.1	Non detected

Maintaining Quality of “Pure Ceylon Tea”: Strategies

2. For MCPA and Glyphosate ----------> RAPID

Active ingredient (a.i.)	ROP Registration No.	Dosage/hectare	Remarks
Glyphosate Iso propyl Amine 29.3% + MCPA Iso propyl Amine 5.8%	Q380000	2.5 L in 500 L of water (22.5 ml in 4.5 L of water)	Avoid spraying for new clearings and pruned fields

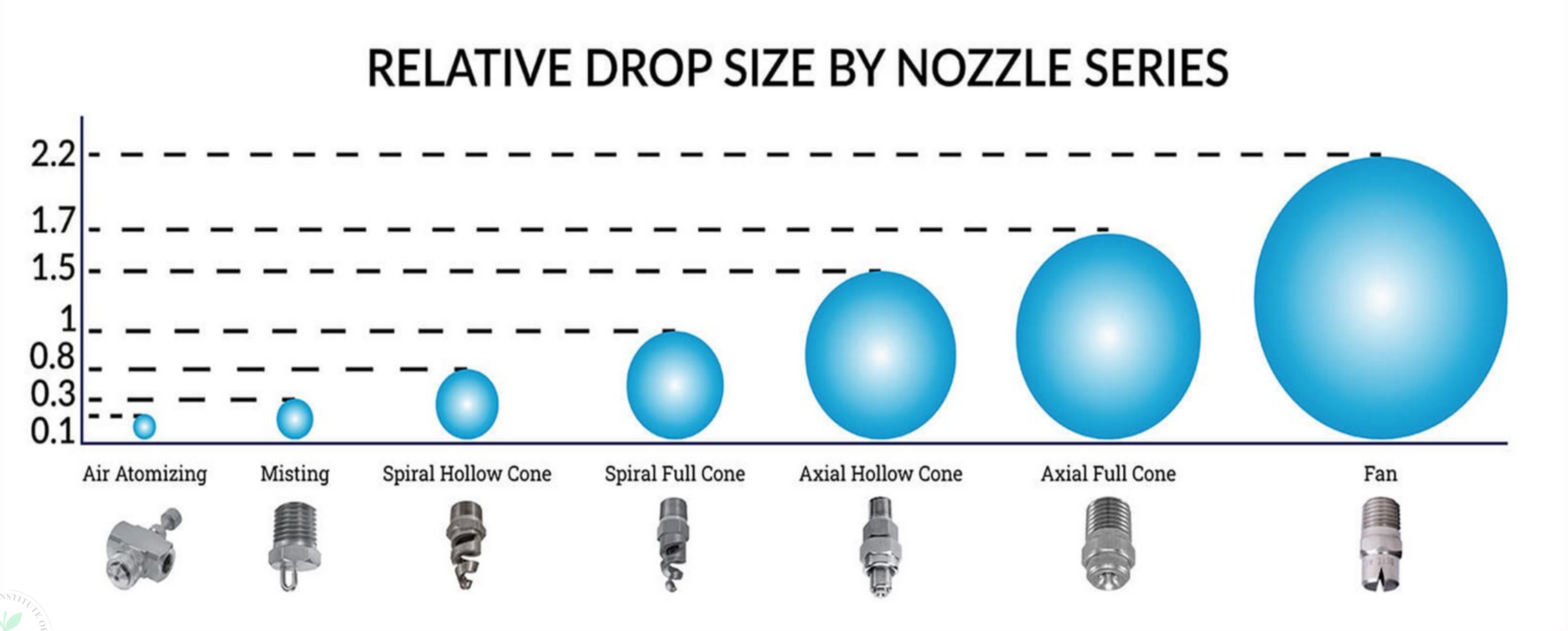
Test value (ppm) with RAPID at 7 days		Japan MRL [ppm]		EU MRL [ppm]	
Glyphosate	MCPA	Glyphosate	MCPA	Glyphosate	MCPA
0.01	<0.01	1	0.06	2	0.1

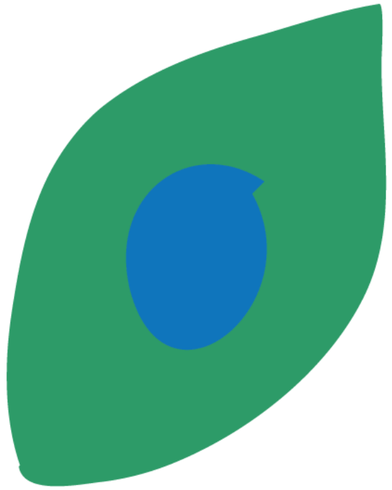
Proper Maintenance of Spray Equipment

Knapsack sprayers

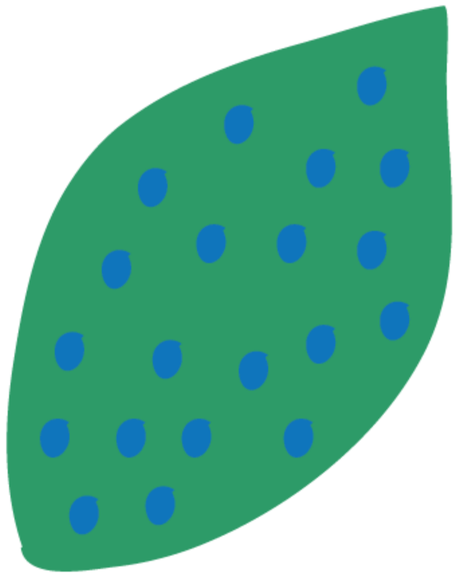
Mist blowers

Use Correct Nozzle

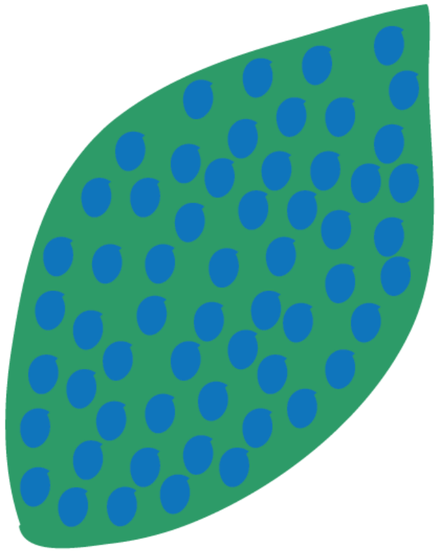




Coarse Droplet – Very Poor Coverage



Medium Size Droplets – Poor Coverage



Fine Droplets – Good Coverage

Rational Use

- Biology of the pest
- Growth stage
- Chemicals- mode of action
- Volume of spray solution/dilution
- Droplet size and coverage
- Time of spraying
- Spray interval, pre-harvest interval

Record Keeping

Chemical Stock Details

Chemical Name:
Active ingredient:
Trade name:
Date of purchase:
Expiry date:

Chemical Spray Details

Date:
Sprayed amount:
Field No:
Extent/ ha:
PHI:

Cautionary Note on Safe and Rational Use of Agro-chemicals in Tea Cultivation

Communication to all stakeholders 06th February 2024

Urgent and important for internal circulation only

Cautionary Note on Safe and Rational Use of Agro chemicals in Tea Cultivation

Sri Lankan teas are considered as the cleanest teas in the world with respect to pesticide residues. Nevertheless, very frequent notifications were reported in the recent past on chemical residue detections in teas exported from Sri Lanka to important destinations such as Germany, Japan, Thaiwan, China, France and *Saudi Arabia*. The alleged chemical compounds include the following as reported by the exporters and regulatory authorities in such market destinations.

Chemicals with TRISL recommendations: MCPA, Glyphosate, Diuron
Chemicals not recommended by the TRISL: *Transfluthrin, Fenarimol, Acetamiprid,* Salicylic Acids, *Transfluthrin, Fenarimol*
Unintended chemicals: Anthroquinone, Pyrrolizidine Alkaloids (PA), Trimesium (trimethylsulfonin), Pentachlorophenol (PCP)

In view of curtailing the border entry violations, immediate remedies are solicited from Sri Lanka ensuring strict compliances to the import and quarantine regulations applicable to such exports. As (i) majority of such alleged detection levels are either reaching the MRLs set by the EU, *Saudi Arabia* and / or Japan, (ii) some are violations by exceeding the Maximum Residue Limits (MRLs) and (iii) the chances of getting such residues in made tea are not possible under the guidance given by the TRISL, TRISL and SLTB are not in a position to justify the cases raised by the regulatory authorities of the importing countries.

As such, all growers and producers are strictly advised to adhere to the following practices in a responsible manner in view of safe guarding the image and reputation maintained by Sri Lanka with respect to its cleanliness in pesticide residues in made tea.

Summary

- ✓ Recommended chemicals- Trade names
- ✓ Dose
- ✓ Pre-Harvest Interval
- ✓ Frequency
- ✓ Pure chemical without mixes
- ✓ Supervision and record keeping

- ✗ Outsourcing

Tea Research Institute of Sri Lanka

THANK YOU !

For Listening to this presentation

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