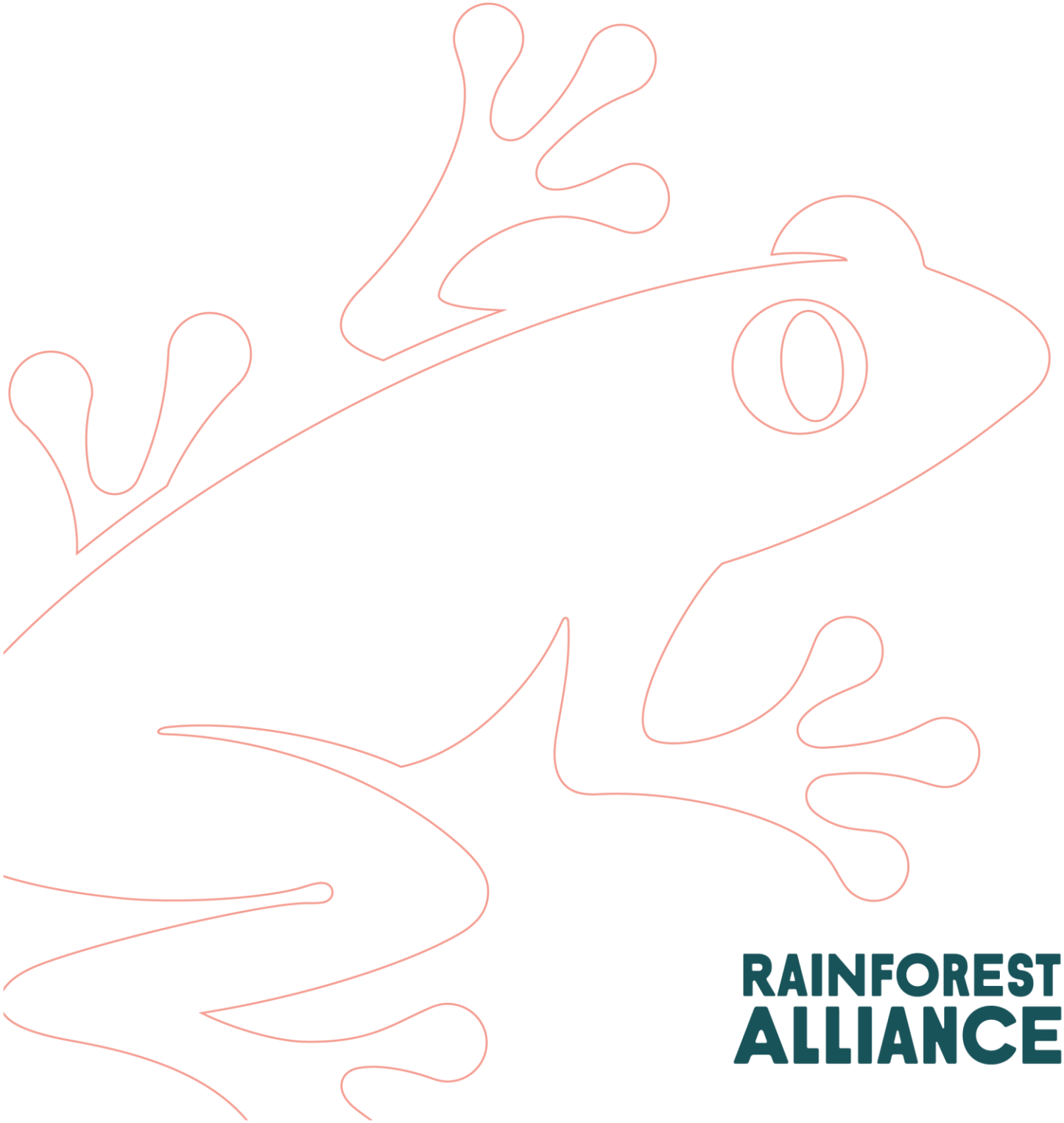
ANNEX 7

Pesticide Management

Version 1
June 2020



RAINFOREST ALLIANCE

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Issue Date:	**Binding date:**	**Expiration date:**
June 30, 2020	July 1, 2021	Until further notice
Developed by:	**Approved by:**	
Rainforest Alliance, Department Standards & Assurance	Chief Supply Chain Officer	
Linked to (code and name of documents, if applicable):		
Rainforest Alliance 2020 Sustainable Agriculture standard, Farm requirements Policy on Exceptional use of FAO/WHO highly hazardous pesticides (to be developed)		
Replaces:		
Rainforest Alliance Lists for Pesticide Management July, 2017, Version 1.3 UTZ List of Banned Pesticides and Pesticides Watchlist Version 1.0, 2015		
Clause or requirement number and text (if applicable):		
Farm requirements 4.5.7, 4.6, 4.7, 5.6.1		
Applicable to:		
All certificate holders		
Country/Regions:		
All		
Crops:	**Type of organizations:**	
Tree crops (such as coffee and cocoa), tea, fruits (such as bananas, coconuts and pineapples), nuts (such as hazelnuts) and cut flowers. Vegetables and palm: subject to confirmation	Supply chain actors, and small and large farms	

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1. RAINFOREST ALLIANCE & INTEGRATED PEST MANAGEMENT

Rainforest Alliance is committed to working towards more sustainable farming practices, including a holistic approach to reducing the impact of environmentally unfriendly farming practices in agriculture. The reduction of hazardous chemicals in agriculture is imperative to address a range of issues, linked to workers' health, pollution of water and soil, greenhouse gas emissions and biodiversity loss. Implementation of Integrated Pest Management (IPM) programs is key to effectively reduce the use of hazardous pesticides. Better IPM follows Rainforest Alliance's principle of continuous improvement and follows a holistic approach as visualized below.

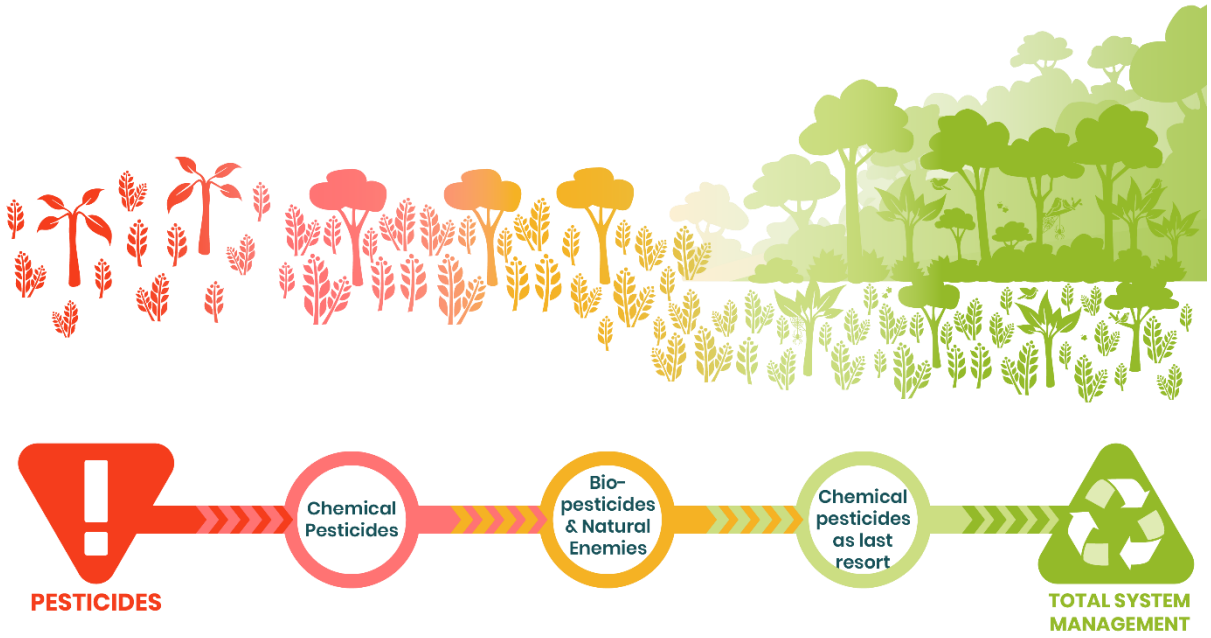

Illustration of a shift to a holistic approach to pest management through a greater reliance on natural solutions and ecosystem services while using chemical pesticides as last resort. Modified from: A total system approach to sustainable pest management, Lewis et al, 1997, PNAS, 94, pp. 12243–12248.

Rainforest Alliance is convinced that better IPM is an investment in the future of sustainable farming. Sustainable farming provides return on investment in the form of ecosystem and worker health, worker satisfaction, value to buyers and consumers and ultimately to farmers' viability. There is increasing evidence that farmers that focus on healthy ecosystems see the return in the quality of their produce, supported by ecosystem services such as pollination, pest predation, water quality and soil fertility.

IPM starts with preventing insects, microorganisms and plants from becoming pests, with healthy soil and farm ecosystems playing a vital role. What factors keep the balance in a particular cropping system, what are natural enemies of potential pests? These are questions that need to be answered in producers' IPM approach.

A second step is monitoring. This not only means measuring and registering pest numbers. It also means that interventions aimed at reducing pest pressure should be carefully considered, based on monitoring data (i.e., is there an early warning system in place; what are economic threshold levels? etc). Pesticides are frequently applied by force of habit or in situations of uncertainty, whether or not pests occur. This can create a vicious cycle of an unbalanced ecosystem over time leading to pest resistance, resurgence and secondary pest outbreaks and where pest pressure increases. This in turn can lead to the need to use ever more aggressive methods to manage the problems.

IPM also means carefully considering all options, including non-chemical alternatives. Rainforest Alliance in its new program plans to work with farmers and other stakeholders (based on field and science-based data), to develop and share best practices that can be scaled. Looking beyond the short term, aiming for cost-effective solutions for business, biodiversity and people's health. Finally, regular evaluation of the effectiveness of interventions is vital to optimize results, demonstrate continuous improvement and contribute to the identification of best practices.

A long-term and lasting reduction in the use of pesticides cannot be achieved by stricter prohibition rules alone. It needs a shift in the mindset on agronomic practices and continuous improvement of the IPM system, which for some crops means gradual, for other more systemic change in managing pests and diseases or the entire agroecosystem. Harmonizing a science and field-based approach, Rainforest Alliance plans to gradually move towards crop-specific IPM approaches. This document should be seen within that context, with use of pesticides on the Risk Mitigation List as a tool of last resort in a larger toolbox. The below lists will be updated regularly, with phase-in times so farmers can adjust.

2. RELATED STANDARD REQUIREMENTS AND GUIDANCE DOCUMENTS

The Rainforest Alliance standard includes multiple requirements that directly and indirectly relate to IPM:

- Requirements in §4.5 on Integrated Pest Management
- Requirements in §4.6 on Agrochemicals Management
- Requirements in §4.7 on Harvest and Post-harvest practices
- Requirement 5.6.1 on Occupational Health and Safety Risks

In addition, to further enhance IPM, the Rainforest Alliance standard documents include guidelines on IPM, on soil assessment and on pruning. It is within this context – the vision on IPM, the standard requirements and guidance documents - that the below Lists of Pesticides should be seen.

3. SCOPE OF THIS ANNEX

The scope of the annex on pesticides management includes the activities within the scope of the Farm requirements. This includes use in agriculture and post-harvest as far as it is carried out by, or for, the producer.
Use of chemicals by other supply chain parties after selling from the farm is not included in the scope at this moment.

4. LISTS OF PESTICIDES WITHIN THE CONTEXT OF IPM

This document contains lists of Prohibited and Risk Mitigation pesticides:

- The use of Prohibited Pesticides is prohibited for certified farms, because they are considered Highly Hazardous Pesticides (HHPs) that present major human health and environmental risks.
- The use of the Risk Mitigation Pesticides is discouraged, and farmers should strive to avoid the use of these pesticides as they are known to bear significant human health and environmental risks. Where they are applied, this should be done within the context of an IPM plan and following the related risk mitigation measures to protect people and the environment.

5. EXCEPTIONAL USE PROCEDURE

Under exceptional circumstances, producers can be granted temporary exemptions for use of pesticides included on the Prohibited List. Exemptions can be granted for the crop and geographical scope (country or part of country) for which the request has been made, and with mandatory risk mitigation requirements. Producers receiving an exemption are obliged to work on IPM alternatives as indicated by Rainforest Alliance, which may include cultural, manual or non-chemical methods. The conditions of each exemption are communicated alongside the decision in the Exceptional Use Policy.
If and when exemptions are granted, they are granted for one year at a time. Rainforest Alliance recognizes that in certain cases phasing out the exempted pesticide will not be possible within one year. In such cases a renewal of the exemption after a year can be considered. However yearly renewal of the request for exceptions and updates on progress and actual use will be required.
Producers who are granted an exemption are required to report on actual use of the exempted pesticide as indicated in the Exceptional use policy.

For a formal request, producers need to submit to ipm@ra.org the following information:

- Country and Region
- Name of the pesticide's active ingredient and details of formulation
- Name of the commercial product in use
- Crop (common and scientific name)
- Pest species to be controlled (common and scientific names)
- Evidence that the specific pest species cannot currently be managed by other methods included in the producer's IPM strategy (e.g. cultural or other non-chemical methods)
- Evidence that other alternatives to control this pest species are not registered by the local authority in the specific production country
- Alternatives the producer is working on

After consideration by Rainforest Alliance's technical team, such exceptions will be included in the Exceptional Use Policy which will be updated half-yearly.

The following procedure will be used[1]:

1. Until June 30/ December 31: Producer sends in request for exception
2. Rainforest Alliance posts incoming requests on our website
3. Rainforest Alliance evaluates and works out required conditions
4. Within 6 months (Until December 31 /June 30): Rainforest Alliance publishes adapted Exceptional use policy, including conditions to work on alternatives

The first round is opened upon publication of this document.

[1] The Rainforest Alliance Assurance Document, Section Rights reserved by the Rainforest Alliance, refers to handling in case of unforeseen cases

6. LIST OF PROHIBITED PESTICIDES

This List is based on the FAO/WHO Guidelines for Highly Hazardous Pesticides[2].
These guidelines include a definition of Highly Hazardous Pesticides (HHPs) following eight criteria. The Rainforest Alliance List of Prohibited Pesticides has eight columns that refer to each of these criteria.

1. WHO Category 1A Extremely hazardous for human health, or 1B Highly hazardous for human health
2. Globally Harmonized System of Classification and Labelling of Chemicals (GHS), Known or presumed carcinogenic,
3. Globally Harmonized System of Classification and Labelling of Chemicals (GHS), Known or presumed mutagenic,
4. Globally Harmonized System of Classification and Labelling of Chemicals (GHS), Known or presumed to be reproductive toxicant, (to induce heritable mutations in the germ cells of humans)
5. Montreal convention, Ozone depleting substances
6. Rotterdam convention on the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, Global treaty designed to give countries the right to refuse the import of highly hazardous toxins listed in the UNEP's PIC Procedure List. It attempts to end the dumping of obsolete or banned pesticides in the developing world6;
7. Stockholm convention, Persistent Organic Pollutants (POPs)
8. Severe effects

Legend:

No.	Prohibited pesticide Active ingredient or group	CAS number	Main use	Acute toxicity Extremely/highly hazardous for human health[1]	Chronic toxicity			International conventions	Severe effects[8]
					Carcinogenic Known or presumed carcinogens[2]	Mutagenic Known or presumed to induce heritable mutations in the germ cells of humans[3]	Reproductive toxicant Known or presumed reproductive toxicants[4]	Montreal Convention[5], Rotterdam Convention[6], Stockholm Convention[7]	

Abbreviations Main use Ac: Acaricide, Ad: Adjuvant, Fun: Fungicide, Fum: Fumigant, H: Herbicide, I: Insecticide, N: Nematicide, R: Rodenticide, Wood Pres.: Wood preservation

No.	PROHIBITED PESTICIDES Active ingredient or group	CAS number	Main use	Acute toxicity[1]	Chronic toxicity			International conventions[5]	Severe effects[6]
					Carcinogenic[2]	Mutagenic[3]	Reproductive toxicant[4]		
1	Abamectin	71751-41-2	I	1B					
2	Acetochlor	34256-82-1	A, I, N						✓
3	Acrolein	107-02-8	H	1B					
4	Alachlor	15972-60-8	H					R	
5	Aldicarb	116-06-3	I, A	1A				R	
6	Alpha chlorohydrin	96-24-2	R	1B					
7	Alpha-BHC; alpha-HCH	319-84-6	I, A					S	

[2] International Code of Conduct on Pesticide Management, Guidelines on Highly Hazardous Pesticides, FAO/WHO, 2016. These are the most recent FAO/WHO Guidelines on HHPs, see here. For the data sources that FAO/WHO refers to (incl. a.o. the European ECHA, the US EPA and the International Agency for Research on Cancer), see pages 25-28 of the same FAO/WHO Guidelines.

No.	PROHIBITED PESTICIDES Active ingredient or group	CAS number	Main use	Acute toxicity[1]	Chronic toxicity			International conventions[5]	Severe effects[6]
					Carcinogenic[2]	Mutagenic[3]	Reproductive toxicant[4]		
8	Aluminum phosphide	20859-73-8	Fum						✓
9	Amitrole	61-82-5	H				✓		
10	Anthracene oil	90640-80-5	Multiple		✓				
11	Arsenic and its compounds	several	Multiple	1B (a)	✓				
12	Atrazine	1912-24-9	H						✓
13	Azafenidin	68049-83-2	H				✓		
14	Azinphos-ethyl	2642-71-9	I, A	1B					
15	Azinphos-methyl	86-50-0	I, A	1B				R	
16	Benomyl	17804-35-2	Fun			✓	✓		
17	Benzovindiflupyr	1072957-71-1	Fun	1B					
18	Beta-cyfluthrin; Cyfluthrin	68359-37-5	I, A	1B					
19	Beta-HCH; beta-BCH	319-85-7	I, A					S	
20	Blasticidin-S	2079-00-7	Fun	1B					
21	Borax; Borate salts*	several	I, A				✓		
22	Boric acid	10043-35-3	I, A				✓		
23	Brodifacoum	56073-10-0	R	1A			✓		
24	Bromadiolone	28772-56-7	R	1A			✓		
25	Bromethalin	63333-35-7	R	1A					
26	Bromophos-ethyl	4824-78-6	I	1B					
27	Butocarboxim	34681-10-2	I, A	1B					
28	Butoxycarboxim	34681-23-7	I, A	1B					
29	Cadusafos	95465-99-9	N, I, A	1B					
30	Calcium cyanide	592-01-8	R	1A					
31	Captafol	2425-06-1	Fun	1A	✓			R	
32	Carbendazim	10605-21-7	Fun			✓	✓		
33	Carbetamide	16118-49-3	H				✓		
34	Carbofuran	1563-66-2	I, A	1B				R	
35	Chlordane	57-74-9	I, A					R, S	
36	Chlorethoxyphos	54593-83-8	I, A	1A					
37	Chlorfenvinphos	470-90-6	I, A	1B					
38	Chlormephos	24934-91-6	I, A	1A					
39	Chlorophacinone	3691-35-8	R	1A			✓		
40	Chlorothalonil	1897-45-6	Fun		✓				
41	Chlorotoluron	15545-48-9	H						✓
42	Chlorpyrifos	2921-88-2	I, A				✓		
43	Chlorpyrifos-methyl	5598-13-0	I, A				✓		
44	Clothianidin	210880-92-5	I, A						✓
45	Coumaphos	56-72-4	I, A	1B					
46	Coumatetralyl	5836-29-3	R	1B			✓		
47	Creosote	8001-58-9	Wood Pres.		✓				
48	Cyproconazole	94361-06-5	Fun				✓		
49	DDT	50-29-3	I, A					R, S	

No.	PROHIBITED PESTICIDES Active ingredient or group	CAS number	Main use	Acute toxicity[1]	Chronic toxicity			International conventions[5]	Severe effects[6]
					Carcinogenic[2]	Mutagenic[3]	Reproductive toxicant[4]		
50	Demeton-S-methyl	919-86-8	I, A	1B					
51	Dichlorvos; DDVP	62-73-7	I, A	1B					
52	Dicofol	115-32-2	I, A					S	
53	Dicrotophos	141-66-2	I, A	1B					
54	Difenacoum	56073-07-5	R	1A			✓		
55	Difethialone	104653-34-1	R	1A			✓		
56	Dimoxystrobin	149961-52-4	Fun						✓
57	Dinocap	39300-45-3	Fun				✓		
58	Dinoterb	1420-07-1	H	1B			✓		
59	Diphacinone	82-66-6	R	1A					
60	Disulfoton	298-04-4	I, A	1A					
61	DNOC and its salts	several	Fun	1B				R	
62	Dustable powder formul. containing a combination of: benomyl ≥7 %, carbofuran ≥10%, thiram ≥15%.	137-26-8_f	I, A					R	
63	E-Phosphamidon	297-99-4	I, A	1A				R	
64	Edifenphos	17109-49-8	I, A	1B					
65	Endosulfan; alpha-Endosulfann; beta Endosulfan*	115-29-7; 959-98-8; 33213-65-9	I, A					R, S	
66	Epichlorohydrin	106-89-8	I, A		✓				
67	EPN	2104-64-5	I, A	1A					
68	Epoxiconazole	133855-98-8	Fun				✓		
69	Ethiofencarb	29973-13-5	I, A	1B					
70	Ethoprophos; Ethoprop	13194-48-4	N, I, A	1A					
71	Ethylene dibromide; 1,2-dibromethane	106-93-4	Fum		✓			R	
72	Ethylene dichloride; 1,2-dichloroethane	107-06-2	Fum		✓			R	
73	Ethylene oxide	75-21-8	Fum		✓	✓		R	
74	Ethylene thiourea	96-45-7	Other				✓		
75	Famphur	52-85-7	I, A	1B					
76	Fenamiphos	22224-92-6	N, I, A	1B					
77	Fenchlorazole-ethyl	103112-35-2	H		✓				
78	Fentin Acetate	900-95-8	Fun						✓
79	Fentin Hydroxide	76-87-9	Fun						✓
80	Fipronil	120068-37-3	I, A						✓
81	Flocoumafen	90035-08-8	R	1A			✓		
82	Fluazifop-butyl	69806-50-4	H				✓		
83	Flucythrinate	70124-77-5	I, A	1B					
84	Flumioxazin	103361-09-7	H				✓		
85	Fluoroacetamide	640-19-7	I, A	1B				R	
86	Flusilazole	85509-19-9	Fun				✓		
87	Formetanate	22259-30-9	I, A	1B					

No.	PROHIBITED PESTICIDES Active ingredient or group	CAS number	Main use	Acute toxicity[1]	Chronic toxicity			International conventions[5]	Severe effects[6]
					Carcinogenic[2]	Mutagenic[3]	Reproductive toxicant[4]		
88	Furathiocarb	65907-30-4	I, A	1B					
89	Glufosinate-ammonium	77182-82-2	H				✓		
90	Heptenophos	23560-59-0	I, A	1B					
91	Hexachlorobenzene	118-74-1	Fun	1A	✓			R, S	
92	Hexachlorocyclohexane; BHC mixed isomers	608-73-1	I, A					R	
93	Hydrogen cyanide	74-90-8	Fum	1A					
94	Imidacloprid	138261-41-3	I, A						✓
95	Iprodione	36734-19-7	Fun		✓				
96	Isoxathion	18854-01-8	I, A	1B					
97	Lindane	58-89-9	I, A					R,S	
98	Linuron	330-55-2	H				✓		
99	Magnesium phosphide	12057-74-8	Fum						✓
100	Mecarbam	2595-54-2	I, A	1B					
101	Mercury and its compounds	several	Fun	1A (a)				R	
102	Methamidophos	10265-92-6	I, A	1B				R	
103	Methidathion	950-37-8	I, A	1B					
104	Methiocarb	2032-65-7	I, A	1B					
105	Methomyl	16752-77-5	I, A	1B					
106	Methyl bromide	74-83-9	Fum					M	
107	Mevinphos	7786-34-7	I, A	1A					
108	Molinate	2212-67-1	H						✓
109	Monocrotophos	6923-22-4	I, A	1B				R	
110	Nicotine	54-11-5	I, A	1B					
111	Nitrobenzene	98-95-3	I, A				✓		
112	Omethoate	1113-02-6	I, A	1B					
113	Oxamyl	23135-22-0	N, I, A	1A					
114	Oxydemeton-methyl	301-12-2	I, A	1B					
115	Paraffin oils with a DMSO content > 3%	several	Adj, A, Fun		✓				
116	Paraquat dichloride	1910-42-5	H					R	✓
117	Parathion	56-38-2	I, A	1A				R	
118	Parathion-methyl	298-00-0	I, A	1A				R	
119	PCP; Pentachlorphenol and its salts	87-86-5	Wood Pres.	1B				R, S	
120	Phorate	298-02-2	I, A	1A					
121	Phosphamidon	13171-21-6	I, A	1A				R	
122	Phosphine	7803-51-2	Fum						✓
123	Profoxydim	139001-49-3	H						✓
124	Propetamphos	31218-83-4	I, A	1B					
125	Propiconazol	60207-90-1	Fun				✓		
126	Propylene oxide, Oxirane	75-56-9	Fum		✓	✓			
127	Quizalofop-p-tefuryl	119738-06-6	H						✓

No.	PROHIBITED PESTICIDES Active ingredient or group	CAS number	Main use	Acute toxicity[1]	Chronic toxicity			International conventions[5]	Severe effects[6]
					Carcinogenic[2]	Mutagenic[3]	Reproductive toxicant[4]		
128	Silafluofen	105024-66-6	I, A				✓		
129	Sodium cyanide	143-33-9	R	1B					
130	Sodium fluoracetate (1080)	62-74-8	R	1A					
131	Spirodiclofen	148477-71-8	I, A		✓				
132	Strychnine	57-24-9	R	1B					
133	Sulfluramid	4151-50-2	I, A					R, S	
134	Sulfotep	3689-24-5	I, A	1A					
135	Tebupirimifos	96182-53-5	I, A	1A					
136	Tefluthrin	79538-32-2	I, A	1B					
137	Tepraloxydim	149979-41-9	H						✓
138	Terbufos	13071-79-9	N, I, A	1A					
139	Thallium sulfate	7446-18-6	R	1B					
140	Thiamethoxam	153719-23-4	I, A						✓
141	Thiofanox	39196-18-4	I, A	1B					
142	Thiometon	640-15-3	I, A	1B					
143	Thiourea	62-56-6	Multiple						✓
144	Triadimenol	55219-65-3	Fun				✓		
145	Triazophos	24017-47-8	I, A	1B					
146	Tributyltin compounds	several	Fun					R	
147	Trichlorfon; Metrifonato	52-68-6	I, A					R	
148	Tridemorph	81412-43-3	Fun				✓		
149	Triflumizole	68694-11-1	Fun				✓		
150	Vamidothion	2275-23-2	I, A	1B					
151	Vinclozolin	50471-44-8	Fu				✓		
152	Warfarin	81-81-2	R	1B			✓		
153	Z-Phosphamidon	23783-98-4	I, A	1A				R (f)	
154	Zeta-Cypermethrin	52315-07-8z	I, A	1B					
155	Zinc phosphide	1314-84-7	R	1B					

Footnotes and other context with the above List of Prohibited Pesticides:

- CAS number is an internationally recognized identifier for chemicals, see www.cas.org
- (a): some actives in this group are classified WHO 1a or WHO 1b

7. OBSOLETE SUBSTANCES

The below table includes pesticides known to be '*obsolete*': no longer formally registered, produced or widely banned. These are included here, as some of these pesticides may still be accessible in some of the countries where Rainforest Alliance certified producers operate. All these substances are not allowed to be used on any Rainforest Alliance certified farm.

No.	OBSOLETE pesticides (active ingredient)	CAS number
1.	2,3,4,5-Bistetrahydro-2- furaldehyde	126-15-8
2.	2,4,5-T	93-76-5
3.	2,4,5-TCP, potassium salt	35471-43-3
4.	Aldrin	309-00-2
5.	Binapacryl	485-31-4
6.	Chloranil	118-75-2
7.	Chlordecone (kepone)	143-50-0
8.	Chlordimeform	6164-98-3
9.	Chlorobenzilate	510-15-6
10.	DBCP	96-12-8
11.	Dieldrin	60-57-1
12.	Dinoseb and its salts and esters	88-85-7
13.	Endrin	72-20-8
14.	Heptachlor	76-44-8
15.	Leptophos	21609-90-5
16.	Mirex	2385-85-5
17.	Nitrofen	1836-75-5
18.	Octamethylpyrophosp horamide (OMPA)	152-16-9
19.	Propham	122-42-9
20.	Safrole	94-59-7
21.	Silvex	93-72-1
22.	Strobane	8001-50-1
23.	TDE	72-54-8
24.	Toxaphene (Camphechlor)	8001-35-2

8. LIST OF RISK MITIGATION PESTICIDES

The use of the Risk Mitigation Pesticides is discouraged, and farmers should strive to avoid the use of these pesticides as they are known to bear significant human health and environmental risks as indicated in the columns[3].
Where these substances are applied, this should be done within the context of an IPM plan and following the related risk mitigation measures to protect people and environment as indicated below the table are taken.

Note: Acetochlor, Carbosulfan, Fenthion and Methoxychlor are now in the Risk Mitigation list, but these substances have been recommended for inclusion in the Rotterdam Convention (PIC) or, for inclusion in the Stockholm Convention (POP). When these substances are officially included, they will move to the Rainforest Alliance Prohibited List. Producers are urged to consider this, use alternative methods where possible and phase out these pesticides in anticipation of the listing under these conventions.

Legend for Main Use column: A: Acaricide, Fun: Fungicide, Fum: Fumigant, H: Herbicide, I: Insecticide, N: Nematicide, R: Rodenticide,

	RISK MITIGATION PESTICIDES	CAS Number	Main Use	Higher level PPE	Aquatic Risk	Wildlife Risk	Pollinator Risk	Bystander Risk
1.	1,3-Dichloropropene	542-75-6	Fum	✓	✓	✓	✓	✓
2.	2,4-D, 2-ethylhexyl ester	1928-43-4	H	✓	✓			
3.	2,4-D, isooctyl ester	53404-37-8	H	✓	✓			
4.	Acephate	30560-19-1	I, A	✓		✓	✓	
5.	Acequinocyl	57960-19-7	I, A		✓			
6.	Acetamiprid	135410-20-7	I, A		✓			
7.	Acifluorfen, sodium salt	62476-59-9	H	✓		✓		
8.	Amitraz	33089-61-1	I, A	✓				✓
9.	Anilazine	101-05-3	Fun		✓			
10.	Avermectin	71751-41-2	I, A	✓	✓		✓	
11.	Azoxystrobin	131860-33-8	Fun		✓			
12.	Bendiocarb	22781-23-3	I, A	✓	✓	✓	✓	✓
13.	Benfluralin	1861-40-1	H			✓		
14.	Benfurcarb	82560-54-1	I, A	✓	✓	✓	✓	
15.	Bensulide	741-58-2	H	✓	✓	✓		✓
16.	Bentazon, sodium salt	50723-80-3	H	✓		✓		✓
17.	Bifenthrin	82657-04-3	I, A		✓		✓	
18.	Bromacil	314-40-9	H	✓	✓			
19.	Bromoxynil butyrate	3861-41-4	H		✓	✓	✓	
20.	Bromoxynil heptanoate	56634-95-8	H		✓			
21.	Bromoxynil octanoate	1689-99-2	H		✓			
22.	Captan	133-06-2	Fun	✓			✓	
23.	Carbaryl	63-25-2	I, A	✓	✓	✓	✓	

[3] The Risk Mitigation Pesticides list and the related risk mitigation measures are based on the work by the Oregon State University Integrated Plant Protection Center's state-of-the-science risk assessment as published in the Supplementary Appendix to the Article 'Selection of agrochemicals to reduce human and environmental health risks' by Paul C. Jepson et al, Lancet Planet Health, Feb 2020

	RISK MITIGATION PESTICIDES	CAS Number	Main Use	Higher level PPE	Aquatic Risk	Wildlife Risk	Pollinator Risk	Bystander Risk
24.	Carbosulfan (recommended PIC)	55285-14-8	I, A	✓	✓	✓	✓	✓
25.	Cartap hydrochloride	15263-53-3	I, A	✓	✓		✓	
26.	Chlorfenapyr	122453-73-0	I, A		✓	✓	✓	
27.	Chloropicrin	76-06-2	Fum	✓	✓	✓		✓
28.	Chlozolinate	84332-86-5	Fun	✓	✓			
29.	Copper hydroxide	20427-59-2	Fun	✓		✓		
30.	Copper oxide (ic)	1317-38-0	Fun		✓			
31.	Copper oxide (ous)	1317-39-1	Fun				✓	
32.	Copper oxychloride	1332-40-7	Fun	✓		✓	✓	
33.	Copper oxychloride sulfate	8012-69-9	Fun	✓			✓	
34.	Copper sulfate (anhydrous)	7758-98-7	Fun		✓			
35.	Copper sulfate (pentahydrate)	7758-99-8	I, A	✓	✓	✓	✓	
36.	Cube root extracts	no cas		✓				✓
37.	Cyanazine	21725-46-2	H	✓		✓		
38.	Cycloate	1134-23-2	H	✓			✓	✓
39.	Cyhalothrin	68085-85-8	I, A	✓	✓		✓	
40.	Cyhalothrin, gamma	76703-62-3	I, A	✓	✓			
41.	Cyhalothrin, lambda	91465-08-6	I, A	✓	✓		✓	
42.	Cypermethrin, alpha	52315-07-8	I, A	✓	✓		✓	
43.	Cypermethrin, beta	65731-84-2	I, A	✓	✓		✓	
44.	Dazomet	533-74-4	Fun	✓	✓	✓	✓	
45.	Deltamethrin	52918-63-5	I, A	✓	✓		✓	
46.	Diazinon	333-41-5	I, A	✓	✓	✓	✓	✓
47.	Dichlobenil	1194-65-6	H	✓		✓		
48.	Dichloran	99-30-9	Fun	✓		✓		✓
49.	Diclofop-methyl	51338-27-3	H	✓		✓		
50.	Difenzoquat methyl sulfate	43222-48-6	H	✓		✓		
51.	Diflubenzuron	35367-38-5	I, A	✓	✓	✓		
52.	Dimethenamid	87674-68-8	H		✓			
53.	Dimethenamid-P	163515-14-8	H		✓			
54.	Dimethoate	60-51-5	I, A	✓	✓	✓	✓	✓
55.	Dinotefuran	165252-70-0	I, A		✓		✓	
56.	Diquat dibromide	85-00-7	H	✓		✓		✓
57.	Diquat ion	2764-72-9	H	✓		✓		
58.	Diuron	330-54-1	H	✓		✓		
59.	Dodine	10/3/2439	Fun	✓	✓	✓	✓	
60.	D-trans Allethrin (Bioallethrin)	584-79-2	I, A	✓				✓
61.	Emamectin benzoate	137512-74-4	I, A	✓	✓		✓	
62.	EPTC	759-94-4	H	✓		✓	✓	✓
63.	Esfenvalerate	66230-04-4	I, A	✓	✓		✓	
64.	Ethalfluralin	55283-68-6	H	✓	✓			
65.	Ethion	563-12-2	I, A	✓	✓	✓	✓	✓

	RISK MITIGATION PESTICIDES	CAS Number	Main Use	Higher level PPE	Aquatic Risk	Wildlife Risk	Pollinator Risk	Bystander Risk
66.	Etoxazole	153233-91-1	I, A		✓			
67.	Famoxadone	131807-57-3	Fun		✓	✓		
68.	Fenbutatin-oxide	13356-08-6	I, A	✓	✓	✓		
69.	Fenitrothion	122-14-5	I, A	✓		✓		
70.	Fenoxycarb	79127-80-3	I, A		✓			
71.	Fenpropathrin	39515-41-8	I, A	✓	✓	✓	✓	
72.	Fenpyroximate	134098-61-6	I, A	✓	✓	✓		
73.	Fenvalerate	51630-58-1	I, A	✓	✓		✓	
74.	Fenthion (recommended PIC)	55-38-9	I, A		✓	✓	✓	
75.	Ferbam	14484-64-1	Fun	✓	✓		✓	✓
76.	Fluazinam	79622-59-6	Fun	✓			✓	✓
77.	Flufenacet	142459-58-3	H	✓	✓			
78.	Fluopyram	658066-35-4	Fun			✓		
79.	Flupyradifurone	951659-40-8	I, A				✓	
80.	Folpet	133-07-3	Fun	✓	✓			
81.	Fomesafen sodium	108731-70-0	H	✓				✓
82.	Formetanate hydrochloride	23422-53-9	I, A	✓	✓	✓	✓	
83.	Glyphosate, isopropylamine salt	38641-94-0	H			✓		
84.	Glyphosate-trimesium	81591-81-3	H			✓		
85.	Haloxyfop-P	95977-29-0	H	✓	✓		✓	✓
86.	Hexazinone	51235-04-2	H	✓	✓	✓		
87.	Indoxacarb, S-isomer	173584-44-6	I, A				✓	
88.	Iodosulfuron methyl, sodium salt	144550-36-7	H		✓			
89.	Isoxaben	82558-50-7	H			✓		
90.	Lenacil	2164-08-1	H		✓			
91.	Lime-sulfur	1344-81-6	I, A	✓		✓		
92.	Lufenuron	103055-07-8	I, A		✓		✓	
93.	Malathion	121-75-5	I, A	✓			✓	
94.	Maleic hydrazide	123-33-1	H				✓	✓
95.	Maleic hydrazide, potassium salt	28382-15-2	H				✓	✓
96.	Mancozeb	8018-01-7	Fun	✓		✓		
97.	Maneb	12427-38-2	Fun	✓		✓	✓	✓
98.	MCPA, 2-ethyl hexyl ester	29450-45-1	H	✓	✓			
99.	MCPA, isooctyl ester	26544-20-7	H	✓	✓			
100.	Metalaxyl	57837-19-1	Fun	✓		✓		
101.	Metam	144-54-7	Fum	✓	✓	✓		
102.	Metam potassium	137-41-7	Fum	✓	✓	✓		
103.	Metam-sodium	6734-80-1	Fum	✓	✓	✓		
104.	Metconazole	125116-23-6	Fun			✓		
105.	Methoprene	40596-69-8	I, A		✓	✓		
106.	Methoxychlor	72-43-5	I, A	✓	✓			
107.	Methyl iodide	74-88-4	Fum	✓	✓	✓		✓

	RISK MITIGATION PESTICIDES	CAS Number	Main Use	Higher level PPE	Aquatic Risk	Wildlife Risk	Pollinator Risk	Bystander Risk
108.	Methyl isothiocyanate	556-61-6	I, A	✓	✓			✓
109.	Metiram	9006-42-2	Fun	✓		✓		✓
110.	Metolachlor	51218-45-2	H	✓		✓		
111.	Metolachlor, (S)	87392-12-9	H	✓	✓			
112.	Metribuzin	21087-64-9	H	✓		✓		
113.	Mineral oil, refined	8042-47-5	I, A		✓			
114.	Monolinuron	1746-81-2	H		✓			
115.	Myclobutanil	88671-89-0	Fun	✓		✓		
116.	Naled	300-76-5	I, A	✓	✓	✓	✓	✓
117.	Napropamide	15299-99-7	H	✓		✓		
118.	Norflurazon	27314-13-2	H		✓	✓		
119.	Novaluron	116714-46-6	I, A		✓			
120.	Oryzalin	19044-88-3	H	✓	✓	✓		
121.	Oxadiazon	19666-30-9	H	✓	✓	✓		
122.	Oxycarboxin	5259-88-1	Fun				✓	
123.	Oxyfluorfen	42874-03-3	H	✓	✓	✓		
124.	Oxythioquinox; Chinomethionat	2439-01-2	Fun, A	✓	✓	✓		
125.	PCNB (Quintozene)	82-68-8	Fun	✓	✓		✓	✓
126.	Pendimethalin	40487-42-1	H			✓		
127.	Permethrin	52645-53-1	I, A	✓	✓	✓	✓	
128.	Phosalone	2310-17-0	I, A	✓	✓	✓		
129.	Phosmet	732-11-6	I, A	✓	✓	✓	✓	
130.	Pirimicarb	23103-98-2	I, A	✓	✓	✓	✓	
131.	Pirimiphos methyl	29232-93-7	I, A	✓	✓	✓	✓	✓
132.	Profenofos	41198-08-7	I, A	✓	✓	✓	✓	✓
133.	Prometryn	7287-19-6	H	✓	✓	✓		
134.	Propamocarb hydrochloride	25606-41-1	Fun	✓			✓	
135.	Propanil	709-98-8	H	✓	✓	✓		
136.	Propargite	2312-35-8	I, A	✓		✓		
137.	Propoxur	114-26-1	I, A	✓	✓	✓	✓	✓
138.	Prosulfuron	94125-34-5	H		✓			
139.	Pyraclostrobin	175013-18-0	Fun	✓	✓			
140.	Pyrazophos	13457-18-6	Fun		✓	✓	✓	
141.	Pyrethrins	8003-34-7	I, A	✓			✓	
142.	Pyridaben	96489-71-3	I, A	✓	✓		✓	
143.	Pyridalyl	179101-81-6	I, A		✓			
144.	Resmethrin	10453-86-8	I, A		✓	✓	✓	
145.	Rotenone	83-79-4	I, A	✓			✓	✓
146.	S-Dimethenamid	163515-14-8	H	✓	✓			
147.	Simazine	122-34-9	H			✓		
148.	Sodium chlorate	7775-09-9	H			✓		
149.	Sodium tetrathiocarbonate	7345-69-9	Fun	✓		✓		
150.	Spinetoram (XDE-175-J)	187166-40-1 935545-74-7	I, A				✓	

	RISK MITIGATION PESTICIDES	CAS Number	Main Use	Higher level PPE	Aquatic Risk	Wildlife Risk	Pollinator Risk	Bystander Risk
151.	Spinosad (mixture of Factors A & D)	131929-60-7	I, A				✓	
152.	Sulfentrazone	122836-35-5	H	✓		✓		
153.	Tecnazene	117-18-0	Fun	✓	✓	✓	✓	
154.	Teflubenzuron	83121-18-0	I, A		✓			
155.	Terrazole; etridiazole	2593-15-9	Fun	✓		✓		✓
156.	Tetrachlorvinphos, Z-isomer	22248-79-9	I, A	✓	✓	✓	✓	
157.	Tetraconazole	112281-77-3	Fun			✓		
158.	Thiabendazole	148-79-8	Fun		✓	✓	✓	
159.	Thiacloprid	111988-49-9	I, A		✓	✓		
160.	Thiobencarb	28249-77-6	H	✓	✓	✓		
161.	Thiodicarb	59669-26-0	M	✓	✓	✓	✓	✓
162.	Thiophanate-methyl	23564-05-8	Fun	✓		✓		
163.	Tolfenpyrad	129558-76-5	I, A	✓	✓			
164.	Triallate	2303-17-5	H	✓	✓	✓		
165.	Triazamate	112143-82-5	I, A		✓	✓		
166.	Triclopyr, triethylamine salt	57213-69-1	H	✓		✓		
167.	Trifloxystrobin	141517-21-7	Fun	✓	✓			
168.	Triflumuron	68628-44-0	I, A		✓	✓	✓	
169.	Trifluralin	1582-09-8	H	✓		✓		
170.	Triforine	26644-46-2	Fun				✓	
171.	Triticonazole	131983-72-7	Fun			✓		
172.	Zineb	12122-67-7	Fun	✓			✓	
173.	Ziram	137-30-4	Fun	✓	✓	✓	✓	

If these substances are used, the specific risk mitigation measures required for the different risk categories include:

a. **"Higher-level personal protection required"** indicates that occupational exposure risk assessments have demonstrated potential for exposure, and significant acute or chronic risks. If labels do not provide details of PPE for applicators, the following PPE are used: wear coveralls over long-sleeved shirt, long pants, socks and stout shoes, with chemically resistant gloves, with protection for eyes (i.e. a face mask or goggles), and respiratory protection (i.e. a respirator).

b. Pesticides listed as having **risk to aquatic life** or **risk to terrestrial wildlife** are only applied if:
    a. *Non-application zones* are used around natural ecosystems and sensitive sites; or
    b. *Vegetative barriers*, or *riparian buffers* and *wetland buffers* are established; or
    c. Other effective mechanisms are used to reduce spray drift.

c. Farms establish and maintain non-crop *vegetative barriers* and *non-application zones* between agrochemical treated crops and areas of human activity.

d. Pesticides listed as having **risk to pollinators** are only applied if

    a. Less toxic, efficacious pesticides are **not** available
    b. Exposure of *natural ecosystems* to pesticides is minimized by establishing non-application zones, or functional *vegetative barriers*; and
    c. Contact of pollinators with these substances is further reduced:

i. Substances are not applied to flowering weeds or flowering weeds are removed; and
ii. Substances are not applied while the crop is in its peak flowering period.

e. Pesticides listed as having **bystander risk** have an increased **inhalation risk** and are only applied if:
    a. *Restricted Entry Intervals* (REIs) are enforced; and
    b. All application sites are flagged to indicate inhalation risks to bystanders.
    c. Pesticide handlers are using respirators with an organic vapor (OV) cartridge or canister with any N, R, P, or 100-series filter.

    Bystanders are defined as people, other than farm workers, pesticide handlers, or their families, who are exposed to pesticides by inhalation.

9. REQUIREMENTS FOR AERIAL APPLICATION

Referring to requirement 4.6.7 in the Farm requirements
In addition to the other requirements on the use of pesticides, for aerial application the following requirements apply.
In case the national legislation framework provides an equivalent safety level compared to these requirements, as confirmed by Rainforest Alliance, such national legislation framework may apply.

1. For aerial application as conducted by helicopters, planes or other manned aerial vehicles that can carry liquids for aerial application.

a. Aerial applications are conducted by a *competent technician* and the application is consistent with *MSDS* and/or label instructions, rates and precautions.
b. Aerial application of agrochemicals with WHO classification 1a and 1b is prohibited.
c. Aerial application of agrochemicals is prohibited on areas outside the legal limits of the farm, public roads, area with human activity, animal farms and natural ecosystems, which include aquatic ecosystems;
d. Aerial application of agrochemicals is prohibited when one of the following conditions occurs:
    i. Temperature exceeds 30 ° C
    ii. Wind speed exceeds 15km/h
    iii. There is an inversion phenomenon
e. Aircraft are equipped with geographical positioning systems (GPS) and automatic or manual shut-off valves connected to the GPS system. The length of the application boom is at maximum 80% of the length of the aircraft. The application equipment is in optimal conditions according to its specifications.
f. Application equipment is calibrated every six months under the corresponding technical supervision and records.
g. Visible signalling systems or effective warning mechanisms are implemented for the notification and protection of third parties. In the case of roads managed by the farm or group administrator, the people that may be affected by the aerial application are identified and warned in advance. Access to the application areas is prohibited and the corresponding re-entry periods are respected.
h. A flight plan that mitigates negative impacts to the adjacent areas of the application area is designed. Agrochemicals are applied in the determined area within the flight plan and the respective *agrochemical non-application zones* are respected. The flight altitude is maximum 5 meters above the crop or vegetative barriers canopy.
i. Aerial drift to the adjacent areas is prevented through agrochemical non-application zones, which is preferred, and/or by existing fully grown and effective vegetative barriers. Agrochemical non-application zones are at minimum
    a. 30 meter wide next to public roads, areas with human activity, animal farms and other natural ecosystems
    b. In the case of rivers, a 15 m non-application zone for each river bank
j. In the case of applications over primary or secondary drains, these are covered with vegetation or other effective physical means.
k. Each aerial application is documented with an operational report, including:
    i. Location of the property;
    ii. Date and time of application (start and end time);
    iii. Type of service performed and type of application equipment, including width of the effective deposition range, model, prefix and type of used aircraft;
    iv. Treated crop and area (in hectares) with a sketch of the area indicating its boundaries, barriers, roads, power grids, buildings, sensitive areas (areas with human activity and natural ecosystems), magnetic north and geographic coordinates (at least one point);

v. Applied agrochemicals, including label name, active ingredient, concentration (volume per litre, mass per kg, or percentage of active ingredient) for each product and quantity of each product applied;
vi. Name of the agrochemicals' handlers;
vii. Flight and application parameters: height of the flight, weather conditions during application time: temperature range, wind speed and direction;
viii. Direction of application ranges (shots); location of the flight track through georeferencing, specifying whether the application was performed with the Differential Global Positioning System (DGPS)

2. In addition to the requirements for aerial application above, for aerial application with drones the following requirements apply.
As the use of drones and the legal regulations for this use are developing fast, these requirements are provisional and may be updated as needed.

a. Aerial application of pesticides by drones follows all existing legislation in the country of application. This includes all legislation applicable to drones and/or UAVs in general, and to aerial application of pesticides by drones and/or UAVs in particular.
b. Aerial application by Unmanned Aerial Vehicles (UAV)[1] weighing more than 150 kg is prohibited.
c. The drones used are specifically designed and produced for the task of aerial application of chemicals. Only drones are used with safety settings to fly to the pilot, hover in place and/or come down slowly vertically upon loss of signal to prevent the drone crossing the farm boundary. The pilot follows all guidance from the producer of the drone, including maximum speeds.
d. Aerial application by drones is performed by pilots who are competent technicians trained by the manufacturer of the drones, specifically for this task, with >1 year of experience flying drones professionally including >6 months experience flying drones designed for aerial application.
e. Before the flight the pilot receives written documentation of the chemical(s) used (brand name, active ingredient(s), concentration and all health and environmental risks associated with that/those active ingredient(s) in that concentration).
f. The flight plan includes where and how to refill the containers.
g. Before the flight the pilot is fully prepared for emergencies with a procedure and equipment for recovering the vehicle, cleaning up and storing chemicals, and warning people within possible reach of the drone.
h. Pesticides are only allowed if the producer explicitly confirms the active ingredients can be used in that combination and concentration in general and for aerial application by drones. The pilot has to ensure to follow all guidance from the producer of the chemical(s) used, including not using a concentration higher than allowed.
i. When in flight, the pilot should ensure to always have the drone in the line of sight.
j. No drone swarms are allowed. Only one drone can be active in flight above a farm at any point in time.
k. Aerial application of pesticides by drones is reported directly to Rainforest Alliance at ipm@ra.org in the month of the first application.
l. In case of subcontracted use of drones, the farm owner is liable in case of any accidents and associated with the use of the drone and responsible for mitigation of all damage related to it, unless otherwise agreed between farm owner and subcontractor. Any accident is reported to Rainforest Alliance through ipm@ra.org within a week.