



# Highly Hazardous Pesticides (HHPs) and their harmonization

16 November 2023

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*“Highly Hazardous Pesticides means pesticides that are acknowledged to present particularly high levels of acute or chronic hazards to health or environment according to internationally accepted classification systems such as WHO or Global Harmonized System (GHS) or their listing in relevant binding international agreements or conventions. In addition, pesticides that appear to cause severe or irreversible harm to health or the environment under conditions of use in a country may be considered to be and treated as highly hazardous”.*

*(International Code of Conduct on Pesticide Management-  
tion (<http://www.fao.org/agriculture/crops/thematic-sitemap/theme/pests/code/en/> )*



# Highly Hazardous Pesticides (HHPs) and their harmonization

Highly hazardous pesticides (HHPs) may have **acute** or **chronic toxic effects**, posing particular risk to children, and are recognized as an issue of global concern.

Their widespread use has caused **health problems** and **fatalities** in many parts of the world, often because of occupational exposure and accidental or intentional poisonings.



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Environmental contamination can also result in human exposure through consumption of residues of pesticides in food as well as possibly drinking-water. Although developed countries have sophisticated systems already in place to register pesticides and control their trade and use, this is not always the case elsewhere.

# Highly hazardous Pesticides Criteria(WHO)

## Highly Hazardous Pesticides Criteria<sup>2,3</sup>

Criterion 1: Acute Toxicity –WHO Recommended Classification of Pesticides by Hazard Classes Ia or Ib.

Criteria 2–4: Chronic Toxicity

- GHS Carcinogenicity Categories 1A and 1B
- GHS Mutagenicity Categories 1A and 1B
- GHS Reproductive Toxicity Categories 1A and 1B.

Criterion 5: Stockholm Convention – Pesticides listed in Annexes A and B.

Criterion 6: Rotterdam Convention – Pesticides listed in Annex III.

Criterion 7: Montreal Protocol – Pesticides listed.

Criterion 8: High incidence of severe or irreversible adverse effects.





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PAN\* International Indicators for Identifying 'Highly Hazardous Pesticides'

1. High acute toxicity
2. Long term toxic effects
3. Endocrine disruptor
4. High environmental concern

\*PAN: *Pesticide Action Work International*

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5. High environmental concern – where two of the three following criteria are met:

- a) **P = 'Very persistent'** half-life > 60 days in marine- or freshwater or half-life > 180 days in soil ('typical' half-life), marine or freshwater sediment) (Indicators and thresholds according to the Stockholm Convention) AND/OR
- b) **B = 'Very bioaccumulative'** (BCF >5000) or Kow logP > 5 (existing BCF data supersede Kow log P data) (Indicators and thresholds according to the Stockholm Convention) AND/OR
- c) **T = Very toxic to aquatic organisms** (LC/EC 50 [48h] for Daphnia spp. < 0,1 mg/l)



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## 6. Hazard to ecosystem services

*'Highly toxic for bees' according to U.S. EPA (LD50,  $\mu\text{g}/\text{bee} < 2$ ) or*

## 7. Known to cause a high incidence of severe or irreversible adverse effects

*Pesticides listed in Annex III of the Rotterdam Convention or meeting the Conventions' criteria*



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## International List of Highly Hazardous Pesticides – March 2021 (PAN)

	CAS number	Pesticide	Grouped (see page 23)	Sum of max=1 in Groups 1-4	Acute Toxicity				Long term effects							Environmental toxicity				Conventions								
					WHO Ia	WHO Ib	H330	max = 1	EPA carc	IARC carc	GHS+ carc (1A, 1B)	IARC prob carc	EPA prob likel carc	GHS+ muta (1A, 1B)	GHS+ repro (1A, 1B)	EU EDC	GHS+ C2 & R2	max = 1	very bio acc	sediment	very pers water, soil or	very toxic to aq. organism	highly toxic bees	max = 1	Montn Prot	PLC	See note below the table	POP
0					30	52	63	118	1	4	14	8	77	5	42	1	58	159	22	18	30	118	150	1	31	0	10	36
1	542-75-6	1,3-dichloropropene		1				0					1				1					0						0
2	94-75-7	2,4-D		1				0								1	1					0						0
3	71751-41-2	Abamectin		2		1	1	1									0				1	1						0
4	30560-19-1	Acephate		1				0									0				1	1						0
5	34256-82-1	Acetochlor		1				0								1	1					0						0
6	62476-59-9	Acifluorfen, sodium		1				0				1					1					0						0
7	101007-06-1	Acrinathrin		1				0									0				1	1						0
8	107-02-8	Acrolein		1		1	1	1									0					0						0
9	15972-60-8	Alachlor		2				0				1				1	1					0		1				1
10	83130-01-2	Alanycarb		1				0									0				1	1						0
11	116-06-3	Aldicarb		3	1		1	1									0				1	1		1				1

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12	319-84-6; 319-85-7	alpha-BHC; alpha-HCH		1			0								0				0			1	1	
13	96-24-2	Alpha-chlorohydrin		1		1	1								0				0				0	
14	20859-73-8	Aluminum phosphide		2			1	1							0				1	1			0	
15	348635-87-0	Amisulbrom		1				0							0		1	1			1		0	
16	61-82-5	Amitrole		1				0						1	1							0	0	
17	90640-80-5	Anthracene oil		1				0		1					1							0	0	
18	84-65-1	Anthraquinone		1				0			1	1			1							0	0	
19	7778-39-4	Arsen and its compounds	x	1				0	1	1	1				1							0	0	
20	68049-83-2	Azafenidin		1				0				1			1							0	0	
21	35575-96-3	Azamethiphos		1				0							0				1	1			0	
22	2642-71-9	Azinphos-ethyl		2		1		1							0					1	1		0	
23	86-50-0	Azinphos-methyl		3		1	1	1							0					1	1	1	1	
24	41083-11-8	Azocyclotin		2			1	1							0	1		1			1		0	
25	22781-23-3	Bendiocarb		1				0							0					1	1		0	
26	82560-54-1	Benfuracarb		1				0							0					1	1		0	
27	17804-35-2	Benomyl		2				0				1	1		1						0	1	X	1
28	741-58-2	Bensulide		1				0							0					1	1		0	
29	177406-68-7	Benthiavalicarb-isopropyl		1				0				1			1							0	0	
30	1820573-27-0	Beta-cyfluthrin		2		1	1	1							0					1	1		0	
31	319-85-7	beta-HCH; beta-BCH		2				0						1	1							0	1	1
32	82657-04-3	Bifenthrin		2				0						1	1						1	1	0	

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33	28434-01-7	Bioresmethrin		2			0					1		1			1	1			0
34	92-52-4	Biphenyl; Diphenyl		1			0		1					1				0			0
35	2079-00-7	Blasticidin-S		1	1		1							0				0			0
36	1303-96-4	Borax; Borate salts	x	1			0					1		1				0			0
37	10043-35-3	Boric acid		1			0					1	1	1				0			0
38	56073-10-0	Brodifacoum		2	1		1					1		1				0			0
39	28772-56-7	Bromadiolone		2	1		1					1		1				0			0
40	63333-35-7	Bromethalin		2	1		1							0	1		1	1			0
41	4824-78-6	Bromophos-ethyl		1		1	1							0				0			0
42	1689-84-5	Bromoxynil		2			1					1		1				0			0
43	56634-95-8	Bromoxynil heptanoate		2			0					1		1	1		1	1			0
44	1689-99-2	Bromoxynil octanoate		2			0					1		1	1		1	1			0
45	23184-66-9	Butachlor		1			0					1		1				0			0
46	34681-10-2	Butocarboxim		2		1	0							0				1	1		0
47	34681-23-7	Butoxycarboxim		1		1	1							0				0			0
48	95465-99-9	Cadusafos		2		1	1							0		1	1	1	1		0
49	592-01-8	Calcium cyanide		1	1		1							0				0			0

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50	2425-06-1	Captafol		3	1			1			1	1	1			1			0	1			1
51	133-06-2	Captan		1				0				1	1						0				0
52	63-25-2	Carbaryl		2				0				1				1	1		1	1			0
53	10605-21-7	Carbendazim		1				0				1	1			1							0
54	16118-49-3	Carbetamide		1				0				1				1							0
55	1563-66-2	Carbofuran		3		1	1	1								0			1	1	1	X	1
56	55285-14-8	Carbosulfan		3			1	1								0			1	1	1	C <sub>PIC</sub>	1
57	2439-01-2	Chinomethionat; Oxythioquinox		1				0				1				1							0
58	500008-45-7	Chlorantranilprole		1				0								0		1	1				1
59	57-74-9	Chlordane		3				0				1				1	1	1				1	1
60	54593-83-8	Chlorethoxyphos		2	1			1								0			1	1			0
61	122453-73-0	Chlorfenapyr		1				0								0			1	1			0
62	470-90-6	Chlorfenvinphos		2		1		1								0			1	1			0
63	71422-67-8	Chlorfluazuron		1				0								0	1		1				1
64	24934-91-6	Chlormephos		1	1			1								0							0
65	67-66-3	Chloroform		1				0				1				1							0
66	3691-35-8	Chlorophacinone		1	1			1								0							0

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67	120-32-1	Chlorophene; 2-benzyl-4-chlorophenol	1			0							1	1				0				0
68	76-06-2	Chloropicrin	1		1	1								0				0				0
69	1897-45-6	Chlorothalonil	2		1	1			1					1				0				0
70	15545-48-9	Chlorotoluron	1			0							1	1				0				0
71	101-21-3	Chlorpropham	1			0							1	1				0				0
72	2921-88-2	Chlorpyrifos	2			0				1				1			1	1				0
73	5598-13-0	Chlorpyrifos-methyl	2			0				1				1			1	1				0
74	67-97-0	Cholecalciferol	1			0				1				1				0				0
75	38083-17-9	Climbazole	1			0								0			1	1				0
76	210880-92-5	Clothianidin	1			0								0			1	1				0
77	20427-59-2	Copper (II) hydroxide	2		1	1								0		1	1	1				0
78	56-72-4	Coumaphos	2		1	1	1				1			1				0				0
79	5836-29-3	Coumatetralyl	1		1	1	1				1			0				0				0
80	8001-58-9	Creosote	1			0			1	1	1			1				0				0
81	420-04-2	Cyanamide	1			0							1	1				0				0
82	21725-46-2	Cyanazine	1			0							1	1				0				0
83	68359-37-5	Cyfluthrin	2		1	1	1							0			1	1				0





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100	62-73-7	Dichlorvos; DDVP		2		1	1	1										0					1	1							0
101	51338-27-3	Diclofop-methyl		1				0					1					1													0
102	115-32-2	Dicofol		1				0										0								C <sub>PO</sub>	P		1	1	
103	141-66-2	Dicrotophos		2		1		1										0						1	1						0
104	56073-07-5	Difenacoum		2	1			1										0	1												0
105	104653-34-1	Difethialone		2	1		1	1					1					1													0
106	60-51-5	Dimethoate		1				0										0							1	1					0
107	149961-52-4	Dimoxystrobin		2				0									1	1		1	1										0
108	39300-45-3	Dinocap		1				0					1					1													0
109	165252-70-0	Dinotefuran		1				0										0							1	1					0
110	1420-07-1	Dinoterb		2		1		1					1					1													0
111	82-66-6	Diphacinone		1	1			1										0													0
112	85-00-7	Diquat dibromide		1			1	1										0													0
113	4032-26-2	Diquat dichloride		1			1	1										0													0
114	298-04-4	Disulfoton		1	1			1										0													0
115	330-54-1	Diuron		1				0					1					1													0
116	534-52-1	DNOC and its salts	x	2		1	1	1										0								1					1

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117	2439-10-3	Dodine	1		1	1								0				0				0
118	17109-49-8	Edifenphos	1		1	1								0				0				0
119	155569-91-8	Emamectin benzoate	1			0								0	1	1	1	1				0
120	115-29-7	Endosulfan	2		1	1								0				0	1		1	1
121	297-99-4	E-Phosphamidon	1	1		1								0				0				0
122	106-89-8	Epichlorohydrin	1			0		1	1	1			1	1				0				0
123	2104-64-5	EPN	2	1		1								0			1	1				0
124	133855-98-8	Epoxiconazole	1			0			1	1	1	1						0				0
125	66230-04-4	Esfenvalerate	1			0								0			1	1				0
126	29973-13-5	Ethiofencarb	1		1	1								0				0				0
127	563-12-2	Ethion	1		1	1								0				0				0
128	23947-60-6	Ethirimol	1			0								0			1	1				0
129	13194-48-4	Ethoprophos; Ethoprop	2	1	1	1			1				1					0				0
130	106-93-4	Ethylene dibromide; 1,2-dibromoethane	2			0		1	1	1			1	1				0	1			1
131	107-06-2	Ethylene dichloride; 1,2-Dichloroethane	2			0		1	1				1					0	1			1
132	75-21-8	Ethylene oxide	2			0	1	1		1	1		1					0	1			1









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166	69409-94-5	Fluvalinate		1		1	1									0				0				0
167	133-07-3	Folpet		2		1	1							1	1					0				0
168	68157-60-8	Forchlorfenuron		1			0							1	1					0				0
169	50-00-0	Formaldehyde		1			0	1		1					1					0				0
170	22259-30-9	Formetanate		2		1	1	1							0					1	1			0
171	98886-44-3	Fosthiazate		1			0								0					1	1			0
172	65907-30-4	Furathiocarb		1		1	1	1							0						0			0
173	98-01-1	Furfural		1			0			1					1						0			0
174	121776-33-8	Furilazole		1			0			1					1						0			0
175	77182-82-2	Glufosinate-ammonium		1			0				1				1						0			0
176	1071-83-6	Glyphosate	x	1			0			1					1						0			0
177	111872-58-3	Halfenprox		1			0								0	1		1			1			0
178	100784-20-1	Halosulfuron-methyl		1			0				1				1						0			0
179	69806-40-2	Haloxypop-methyl (unstated stereochemistry)		1			0			1					1								0	0
180	23560-59-0	Heptenophos		2		1	1								0						1	1		0
181	118-74-1	hexachlorobenzene / benzene hexachloride (HCB/BHC)		4	1		1		1	1				1	1	1					1	1	1	1

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182	86479-06-3	Hexaflumuron	1			0							0			1	1			0
183	608-73-1	Hexachlorocyclohexane; mix of isomers (beta-HCH & alpha-HCH)	2			0			1			1	1				0		1	1
184	78587-05-0	Hexythiazox	1			0			1				1				0			0
185	74-90-8	Hydrogen cyanide**	1	1	1	1							0							0
186	35554-44-0	Imazalil	1			0			1				1				0			0
187	58594-72-2	Imazalil sulfate	1			0			1				1				0			0
188	138261-41-3	Imidacloprid	1			0							0			1	1			0
189	72963-72-5	Imiprothrin	1			0							0			1	1			0
190	173584-44-6	Indoxacarb	1			0							0			1	1			0
191	36734-19-7	Iprodione	1			0			1				1				0			0
192	140923-17-7	Iprovalicarb	1			0			1				1				0			0
193	881685-58-1	Isopyrazam	2			0			1				1	1	1		1			0
194	141112-29-0	Isoxaflutole	1			0			1				1				0			0
195	18854-01-8	Isoxathion	2		1	1							0			1	1			0
196	143390-89-0	Kresoxim-methyl	1			0			1				1				0			0
197	77501-63-4	Lactofen	1			0			1				1				0			0

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198	91465-08-6	Lambda-cyhalothrin		2		1	1							0			1	1				0
199	58-89-9	Lindane		3			0		1				1	1			1	1		1		1
200	330-55-2	Linuron		1			0					1	1	1					0			0
201	103055-07-8	Lufenuron		1			0							0	1	1	1		1			0
202	12057-74-8	Magnesium phosphide		1		1	1							0					0			0
203	121-75-5	Malathion		2			0			1				1			1	1				0
204	8018-01-7	Mancozeb		1			0			1	1	1	1	1					0			0
205	12427-38-2	Maneb		1			0			1			1	1					0			0
206	2595-54-2	Mecarbam		1	1		1							0					0			0
207	7085-19-0	Mecoprop; MCPP		1			0					1	1						0			0
208	110235-47-7	Mepanipyrim		1			0			1				1					0			0
209	131-72-6	Meptyldinocap		1			0				1			1					0			0
210	7439-97-6	Mercury and its compounds	x	2		1	1							0					0		1	1
211	139968-49-3	Metaflumizone		1			0							0	1	1		1	1			0
212	137-41-7	Metam-potassium		1			0			1				1					0			0
213	137-42-8	Metam-sodium		1			0			1			1	1					0			0
214	18691-97-9	Methabenzthiazuron		1			0							0				1	1			0

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215	10265-92-6	Methamidophos		3	1	1	1								0			1	1	1	X	1
216	950-37-8	Methidathion		2	1		1								0			1	1			0
217	2032-65-7	Methiocarb		2	1		1								0			1	1			0
218	16752-77-5	Methomyl		2	1		1								0			1	1			0
219	72-43-5	Methoxychlor		1			0								0						1	1
220	74-83-9	Methyl bromide		1			0								0			0	1			1
221	9006-42-2	Metiram		1			0			1			1	1					0			0
222	21087-64-9	Metribuzin		1			0						1	1					0			0
223	7786-34-7	Mevinphos		2	1		1								0			1	1			0
224	51596-10-2	Milbemectin		1			0								0			1	1			0
225	2212-67-1	Molinate		1			0						1	1					0			0
226	71526-07-3	MON 4660; AD 67		1			0			1				1					0			0
227	6923-22-4	Monocrotophos		3	1	1	1								0			1	1	1		1
228	300-76-5	Naled		1			0								0			1	1			0
229	54-11-5	Nicotine		1	1	1	1								0				0			0
230	150824-47-8	Nitenpyram		1			0								0			1	1			0
231	98-95-3	Nitrobenzene		1			0			1		1	1						0			0



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232	121451-02-3	Noviflumuron		1			0				1				1				0				0
233	1113-02-6	Omethoate		3		1	1						1	1				1	1				0
234	19044-88-3	Oryzalin		1			0				1			1					0				0
235	19666-30-9	Oxadiazon		1			0				1			1					0				0
236	23135-22-0	Oxamyl		2	1		1	1						0					1	1			0
237	301-12-2	Oxydemeton-methyl		2		1		1						0					1	1			0
238	42874-03-3	Oxyfluorfen		1			0				1			1						0			0
239	64741-88-4	Paraffin oils; mineral oils	x	1			0			1				1						0			0
240	1910-42-5	Paraquat dichloride / Paraquat dichloride >276g/L		2			1	1						0						0	1	CF	1
241	56-38-2	Parathion		3	1			1						0					1	1	1		1
242	298-00-0	Parathion-methyl		2	1		1	1						0						0	1	X	1
243	87-86-5	PCP; Pentachlorophenol		3		1	1	1			1			1						0	1		1
244	40487-42-1	Pendimethalin		1				0						0	1	1				1			0
245	52645-53-1	Permethrin		2				0			1			1					1	1			0
246	2597-03-7	Phenthoate		1				0						0					1	1			0
247	298-02-2	Phorate		2	1			1						0					1	1			0



# Highly Hazardous Pesticides (HHPs) and their harmonization

265	34643-46-4	Prothiofos		1			0							0	1		1		1				0
266	123312-89-0	Pymetrozine		1			0			1				1					0				0
267	77458-01-6	Pyraclufos		1			0							0				1	1				0
268	129630-19-9	Pyraflufen-ethyl		1			0			1				1					0				0
269	6814-58-0	Pyrazachlor		1			0			1				1					0				0
270	13457-18-6	Pyrazophos		1			0							0				1	1				0
271	108-34-9	Pyrazoxon		1		1	1							0					0				0
272	8003-34-7	Pyrethrins, Pyrethrum extract		1			0							0					1	1			0
273	96489-71-3	Pyridaben		1			0							0					1	1			0
274	179101-81-6	Pyridalyl		1			0							0	1	1	1			1			0
275	119-12-0	Pyridiphenthion		1			0							0					1	1			0
276	105779-78-0	Pyrimidifen		1		1	1							0						0			0
277	13593-03-8	Quinalphos		2			0					1	1						1	1			0
278	2797-51-5	Quinoclamine		1			0							0					1	1			0
279	148-24-3	Quinolin-8-ol; 8-hydroxyquinoline		1			0				1			1						0			0
280	124495-18-7	Quinoxifen		1			0							0	1		1			1			0







# Highly Hazardous Pesticides (HHPs) and their harmonization

315	137-26-8	Thiram in formulations with benomyl and carbofuran		1				0								0				0		1	X			1
316	330459-31-9	Tioxazafen		1				0				1				1				0						0
317	129558-76-5	Tolfenpyrad		1				0								0	1		1	1						0
318	731-27-1	Tolyfluanid		2			1	1				1				1				0						0
319	66841-25-6	Tralomethrin		1				0								0			1	1						0
320	55219-65-3	Triadimenol		1				0				1				1				0						0
321	2303-17-5	Tri-allate		1				0								0		1	1	1						0
322	24017-47-8	Triazophos		1		1		1								0				0						0
323	78-48-8	Tribufos, Tribuphos		1				0				1				1				0						0
324	nocas 8	Tributyltin compounds	x	2				0						1	1					0		1				1
325	52-68-6	Trichlorfon		3				0				1		1	1				1	1		1				1
326	76-03-9	Trichloroacetic acid		1				0						1	1					0						0
327	81412-43-3	Tridemorph		1				0				1			1					0						0
328	99387-89-0	Triflumizole		1				0				1			1					0						0
329	1582-09-8	Trifluralin		2				0						1	1	1				1						0
330	37248-47-8	Validamycin		1				0								0				1	1					0





**THANK YOU**

**FOR YOUR**

**ATTENTION**