Food Alliance List of "High Risk" Active Pesticide Ingredients and Required Risk Mitigations[1]

The tables below specify risks associated with, and requirements to mitigate the risks of 166 active pesticide ingredients which have been identified as posing significant risks to human workers/bystanders, aquatic life, wildlife, and/or pollinators. This list is the result of an analysis performed by Oregon State University Integrated Plant Protection Center (OSU-IPPC) using the risk assessment tool IPM PRiME, and a risk model that identifies moderate to high (10% or greater) risk. This list will be reviewed by Food Alliance on an annual basis, and results of further analyses conducted by OSU will be incorporated into the list. The following parameters were used by OSU-IPPC to identify high risks:

1. **Risk to aquatic life:** Pesticides qualified for this risk category if one or more IPM PRiME aquatic risk models (aquatic algae, aquatic invertebrates, or fish chronic risk) exhibited high risk at a typical application rate.

2. **Risk to wildlife:** Pesticides qualified for this risk category if one or more IPM PRiME terrestrial risk models (avian reproductive, avian acute, or small mammal risk) exhibited high risk at a typical application rate.

3. **Risk to pollinators:** Pesticides were selected based on a widely-used hazard quotient (HQ) resulting of pesticide application rate (AR) in g a.i./ha, and contact LD50 for the honey bee (Apis mellifera). Values of HQ<50 have been validated as low risk in the European Union, and monitoring indicates that products with an HQ>2,500 are associated with a high risk of hive loss. The HQ value used for this analysis is >350, corresponding to a 15% risk of hive loss. The quotient includes a correction for systemic pesticides, where risks to bees are amplified.

4. **Inhalation risk:** Inhalation risk to bystanders was calculated using the IPM PRiME model for inhalation toxicity (Jepson et al., 2014[2]), calculated on the basis of child exposure and susceptibility. This index is protective for workers who may enter fields during or after application, and also bystanders.

Active Ingredient	CAS number	Risk to Aquatic life	Risk to Wildlife	Risk to Pollinators	Inhalation risk
1) **1,3-Dichloropropene**	542-75-6	☐	☐	☐	☐
2) **2,4-D, 2-ethylhexylester**	1928-43-4	☐			
3) **2,4-D, isooctylester**	53404-37-8	☐			
4) **Acephate**	30560-19-1		☐	☐	
5) **Acequinocyl**	57960-19-7	☐			
6) **Acetamiprid**	135410-20-7	☐			
7) **Acifluorfen, sodiumsalt**	62476-59-9		☐		
8) **Amitraz**	33089-61-1				☐

[1] The List of High Risk Active Pesticide Ingredients is a product of U.S.A. public funding and the intellectual property of the analysis for this list resides within Oregon State University.

[2] Jepson, P.C., Guzy, M., Blaustein, K., Sow, M., Sarr, M., Mineau, P., Kegley, S. (2014) Measuring pesticide ecological and health risks in West African agriculture to establish an enabling environment for sustainable intensification. Philosophical Transactions of the Royal Society B, http://rstb.royalsocietypublishing.org/content/369/1639/20130491

Active Ingredient	CAS number	Risk to Aquatic life	Risk to Wildlife	Risk to Pollinators	Inhalation risk
9) **Amitrole**	61-82-5		☐		
10) **Anilazine**	101-05-3	☐			
11) **Avermectin**	71751-41-2	☐		☐	
12) **Azoxystrobin**	131860-33-8	☐			
13) **Bendiocarb**	22781-23-3	☐	☐	☐	☐
14) **Benfluralin**	1861-40-1		☐		
15) **Bensulide**	741-58-2	☐	☐		☐
16) **Bentazon, sodium salt**	50723-80-3		☐		☐
17) **Bifenthrin**	82657-04-3	☐		☐	
18) **Bromacil**	314-40-9	☐			
19) **Bromoxynil heptanoate**	56634-95-8	☐			
20) **Bromoxynil octanoate**	1689-99-2	☐			
21) **Captan**	133-06-2			☐	
22) **Carbaryl**	63-25-2	☐	☐	☐	
23) **Chlorine dioxide**	10049-04-4				☐
24) **Chlormequat chloride**	999-81-5		☐		
25) **Chloropicrin**	76-06-2	☐	☐		☐
26) **Chlorothalonil**	1897-45-6	☐	☐		
27) **Chlorpyrifos**	2921-88-2	☐	☐	☐	☐
28) **Chlorpyrifos-methyl**	5598-13-0				☐
29) **Copper hydroxide**	20427-59-2		☐		
30) **Copper oxide (ic)**	1317-38-0	☐			
31) **Copper oxide (ous)**	1317-39-1			☐	
32) **Copper oxychloride**	1332-40-7		☐	☐	
33) **Copper oxychloride sulfate**	8012-69-9			☐	
34) **Copper sulfate (anhydrous)**	7758-98-7	☐			
35) **Copper sulfate (pentahydrate)**	7758-99-8	☐	☐	☐	
36) **Cube extracts**					☐
37) **Cyanazine**	21725-46-2		☐		
38) **Cycloate**	1134-23-2			☐	☐
39) **Cyhalothrin, gamma**	76703-62-3	☐			
40) **Cyhalothrin, lambda**	91465-08-6	☐		☐	
41) **Cypermethrin**	52315-07-8	☐		☐	
42) **Cypermethrin, beta**	65731-84-2	☐		☐	
43) **Dazomet**	533-74-4	☐	☐	☐	
44) **Deltamethrin**	52918-63-5	☐		☐	
45) **Diazinon**	333-41-5	☐	☐	☐	☐
46) **Dichlobenil**	1194-65-6		☐		
47) **Dichloran**	99-30-9		☐		☐
48) **Diclofop-methyl**	51338-27-3		☐		

Active Ingredient	CAS number	Risk to Aquatic life	Risk to Wildlife	Risk to Pollinators	Inhalation risk
49) **Dicofol**	115-32-2		☐		☐
50) **Difenzoquat methyl sulfate**	43222-48-6		☐		
51) **Diflubenzuron**	35367-38-5	☐	☐		
52) **Dimethenamid-P**	163515-14-8	☐			
53) **Dimethoate**	60-51-5	☐	☐	☐	☐
54) **Dinotefuran**	165252-70-0	☐		☐	
55) **Diphenylamine**	122-39-4	☐			
56) **Diquat dibromide**	85-00-7		☐		☐
57) **Diquat ion**	2764-72-9		☐		
58) **Diuron**	330-54-1		☐		
59) **Dodine**	2439-10-3	☐	☐	☐	
60) **D-trans Allethrin (Bioallethrin)**	584-79-2				☐
61) **Emamectin benzoate**	137512-74-4	☐		☐	
62) **EPTC**	759-94-4		☐	☐	☐
63) **Esfenvalerate**	66230-04-4	☐		☐	
64) **Ethalfluralin**	55283-68-6	☐			
65) **Ethion**	563-12-2	☐	☐	☐	☐
66) **Etoxazole**	153233-91-1	☐			
67) **Famoxadone**	131807-57-3	☐	☐		
68) **Fenbutatin-oxide**	13356-08-6	☐	☐		
69) **Fenitrothion**	122-14-5		☐		
70) **Fenoxycarb**	79127-80-3	☐			
71) **Fenpropathrin**	39515-41-8	☐	☐	☐	
72) **Fenpyroximate**	134098-61-6	☐	☐		
73) **Fentin hydroxide**	76-87-9	☐	☐		
74) **Ferbam**	14484-64-1	☐		☐	☐
75) **Fluazinam**	79622-59-6			☐	☐
76) **Flufenacet**	142459-58-3	☐			
77) **Fluopyram**	658066-35-4		☐		
78) **Folpet**	133-07-3	☐			
79) **Fomesafen sodium**	108731-70-0				☐
80) **Formaldehyde**	50-00-0	☐	☐		☐
81) **Formetanate hydrochloride**	23422-53-9	☐	☐	☐	
82) **Glyphosate, isopropylamine salt**	38641-94-0		☐		
83) **Glyphosate-trimesium**	81591-81-3		☐		

Active Ingredient	CAS number	Risk to Aquatic life	Risk to Wildlife	Risk to Pollinators	Inhalation risk
84) **Hexazinone**	51235-04-2	☐	☐		
85) **Hydrogen cyanamide**	420-04-2	☐	☐	☐	☐
86) **Indoxacarb, S-isomer**	173584-44-6			☐	
87) **Iodosulfuron methyl, sodium salt**	144550-36-7	☐			
88) **Isoxaben**	82558-50-7		☐		
89) **Lenacil**	2164-08-1	☐			
90) **Lime-sulfur**	1344-81-6		☐		
91) **Malathion**	121-75-5			☐	
92) **Maleic hydrazide, potassium salt**	28382-15-2			☐	☐
93) **Mancozeb**	8018-01-7		☐		
94) **Maneb**	12427-38-2		☐	☐	☐
95) **MCPA, 2-ethyl hexyl ester**	29450-45-1	☐			
96) **MCPA, isooctyl ester**	26544-20-7	☐			
97) **Metalaxyl**	57837-19-1		☐		
98) **Metam potassium**	137-41-7	☐	☐		
99) **Metconazole**	125116-23-6		☐		
100) **Methoprene**	40596-69-8	☐	☐		
101) **Methoxychlor**	72-43-5	☐			
102) **Methyl iodide**	74-88-4	☐	☐		☐
103) **Methyl isothiocyanate**	556-61-6	☐			☐
104) **Metiram**	9006-42-2		☐		☐
105) **Metolachlor**	51218-45-2		☐		
106) **Metolachlor, (S)**	87392-12-9	☐			
107) **Metribuzin**	21087-64-9		☐		
108) **Mineral oil, refined**	8042-47-5	☐			
109) **Myclobutanil**	88671-89-0		☐		
110) **Nabam**	142-59-6		☐	☐	
111) **Naled**	300-76-5	☐	☐	☐	☐
112) **Napropamide**	15299-99-7		☐		
113) **Norflurazon**	27314-13-2	☐	☐		
114) **Novaluron**	116714-46-6	☐			
115) **Ortho-phenylphenol**	90-43-7	☐			
116) **Ortho-phenylphenol, sodium salt**	132-27-4			☐	☐
117) **Oryzalin**	19044-88-3	☐	☐		
118) **Oxadiazon**	19666-30-9	☐	☐		
119) **Oxycarboxin**	5259-88-1			☐	
120) **Oxyfluorfen**	42874-03-3	☐	☐		

Active Ingredient	CAS number	Risk to Aquatic life	Risk to Wildlife	Risk to Pollinators	Inhalation risk
121) **Oxythioquinox**	2439-01-2	☐	☐		
122) **PCNB (Quintozene)**	82-68-8	☐		☐	☐
123) **Pendimethalin**	40487-42-1		☐		
124) **Permethrin**	52645-53-1	☐	☐	☐	
125) **Phosalone**	2310-17-0	☐	☐		
126) **Phosmet**	732-11-6	☐	☐	☐	
127) **Pirimicarb**	23103-98-2	☐	☐	☐	
128) **Prometryn**	7287-19-6	☐	☐		
129) **Propamocarb hydrochloride**	25606-41-1			☐	
130) **Propanil**	709-98-8	☐	☐		
131) **Propargite**	2312-35-8		☐		
132) **Propoxur**	114-26-1	☐	☐	☐	☐
133) **Prosulfuron**	94125-34-5	☐			
134) **Pyraclostrobin**	175013-18-0	☐			
135) **Pyrethrins**	8003-34-7			☐	
136) **Pyridaben**	96489-71-3	☐		☐	
137) **Resmethrin**	10453-86-8	☐	☐	☐	
138) **Rotenone**	83-79-4			☐	☐
139) **S-Dimethenamid**	163515-14-8	☐			
140) **Simazine**	122-34-9		☐		
141) **Sodium chlorate**	7775-09-9		☐		
142) **Sodium dimethyl dithio carbamate**	128-04-1		☐		☐
143) **Sodium hypochlorite**	7681-52-9	☐			
144) **Sodium tetrathiocarbonate**	7345-69-9		☐		
145) **Spinetoram (XDE-175-J)**	187166-40-1 935545-74-7			☐	
146) **Spinosad (mixture of Factors A & D)**	131929-60-7			☐	
147) **Spirodiclofen**	148477-71-8	☐			
148) **Sulfentrazone**	122836-35-5		☐		
149) **Terrazole; etridiazole**	2593-15-9		☐		☐
150) **Tetrachlorvinphos, Z-isomer**	22248-79-9	☐	☐	☐	
151) **Tetraconazole**	112281-77-3		☐		
152) **Thiabendazole**	148-79-8	☐	☐	☐	
153) **Thiacloprid**	111988-49-9	☐	☐		

Active Ingredient	CAS number	Risk to Aquatic life	Risk to Wildlife	Risk to Pollinators	Inhalation risk
154) **Thiobencarb**	28249-77-6	☐	☐		
155) **Thiodicarb**	59669-26-0	☐	☐	☐	☐
156) **Thiophanate-methyl**	23564-05-8		☐		
157) **Tolfenpyrad**	129558-76-5	☐			
158) **Triadimenol**	55219-65-3		☐		
159) **Triallate**	2303-17-5	☐	☐		
160) **Triclopyr, triethylamine salt**	57213-69-1		☐		
161) **Trifloxystrobin**	141517-21-7	☐			
162) **Trifluralin**	1582-09-8		☐		
163) **Triforine**	26644-46-2			☐	
164) **Triticonazole**	131983-72-7		☐		
165) **Zineb**	12122-67-7			☐	
166) **Ziram**	137-30-4	☐	☐	☐	

Risks associated with the use of pesticides containing any of the active ingredients listed above must be mitigated through implementation of the following practices:

Risk Type	Required Mitigations
Risk to aquatic life; Risk to wildlife	Pesticides containing active ingredients which pose high risks to aquatic life or wildlife are only used if: Non-application zones around aquatic natural ecosystems are enforced, vegetative barriers are established, or other effective mechanisms are implemented to reduce spray drift.
Risk to pollinators	Pesticides containing active ingredients which pose high risks to pollinators are only used if: a) Less toxic, efficacious pesticides are not available. b) Exposure to natural ecosystems is minimized by enforcing non-application zones, by establishing vegetative barriers, or implementing other effective mechanisms to reduce spray drift. c) Contact of pollinators with these substances is further reduced through: only applying substances when pollinators are not active; not applying substances to flowering weeds or removing flowering weeds; applying substances while the crop is not in peak flowering period. d) If bee hives are used, they are temporarily covered during application, and hive bees are provided with a clean water source outside the treated area.
Inhalation risk	Pesticides containing active ingredients which pose high inhalation risks are only used if: a) Functional Personal Protective Equipment (PPE) is used in accordance with the product's MSDS, safety tag or other instructions (whichever are more stringent) and is provided free of cost to workers. b) All persons who mix or handle pesticides, fertilizers, hazardous materials, or other chemical substances or natural pest control substances with possible dermatological or microbiological risks use PPE. c) Restricted entry intervals are enforced and respirators with an organic vapor (OV) cartridge or canister with any N, R, P, or 100 series pre-filter are used. d) Application sites are flagged to indicate inhalation risks to bystanders.