

**Table C6: Illnesses and Injuries Reported in California<sup>1</sup> Associated With<sup>2</sup> Pesticide Exposure, Summarized by Pesticide(s) and Type of Illness  
2021**

Pesticide <sup>3</sup>	Systemic/ Respiratory <sup>4</sup>		Topical <sup>4</sup>		Total	
	Definite/ Probable	Possible	Definite/ Probable	Possible	Definite/ Probable	Possible
<b>Organophosphates</b>						
Acephate	2	0	1	1	3	1
Bensulide	7	0	1	0	8	0
DDVP	7	0	0	0	7	0
Malathion	9	0	0	0	9	0
Methamidophos	5	0	0	0	5	0
<b>N-Methyl Carbamates</b>						
Carbaryl	0	1	0	0	0	1
Formetanate Hydrochloride	0	0	1	0	1	0
<b>Pyrethrins and Pyrethroids</b>						
Beta-Cyfluthrin	2	1	1	0	4	1
Bifenthrin	2	2	2	0	4	2
Cypermethrin	11	1	2	0	17	1
Deltamethrin	0	0	2	0	2	0
Gamma-Cyhalothrin	6	2	3	0	9	2
Lambda-Cyhalothrin	0	0	2	0	2	0
Permethrin	1	0	0	0	1	0
Zeta-Cypermethrin	1	1	0	0	1	1
<b>Organochlorines</b>						
Chlordane	0	1	0	0	0	1
<b>Other Pesticides</b>						
Alkyl Amino Propane	0	0	1	0	1	0
Aluminum Phosphide	5	1	0	0	6	1
Amitraz	0	0	0	0	1	0
Borax	1	1	0	0	1	1
Boric Acid	3	2	1	0	5	3
Bromethalin	0	1	0	0	0	1

Pesticide <sup>3</sup>	Systemic/ Respiratory <sup>4</sup>		Topical <sup>4</sup>		Total	
	Definite/ Probable	Possible	Definite/ Probable	Possible	Definite/ Probable	Possible
Chlorfenapyr	1	0	0	0	1	0
Chlorinated-Cyanuric Acid	0	0	1	0	1	0
Chlorine	1	0	0	0	1	0
Chloropicrin	4	0	1	0	5	0
Chlorothalonil	3	1	0	1	3	2
Cholecalciferol	1	0	0	0	1	0
Copper Acetoarsenite	0	1	0	0	0	1
Copper Ammonium Complex	0	0	1	0	1	0
Copper Naphthenate	1	0	0	1	1	1
Deet	1	0	1	1	4	1
Dinotefuran	0	2	0	0	0	2
Diphacinone	1	1	0	0	1	1
Diquat	1	0	1	0	2	0
Dithiopyr	0	0	1	0	1	0
Endothall	0	0	1	0	1	0
Etofenprox	1	0	0	0	1	0
Fipronil	1	1	0	0	1	1
Glycolic Acid	4	0	0	0	4	0
Glyphosate	4	1	1	0	5	1
Hydrogen Chloride	1	1	3	0	6	1
Hydrogen Peroxide	0	0	4	0	4	0
Indoxacarb	0	1	0	0	0	1
Isothiazoline Disinfectants	0	0	2	0	2	0
Metaldehyde	0	0	0	0	0	1
Methoxyfenozide	0	0	1	0	1	0
Neem Oil	0	1	0	0	0	1
Nonanoic Acid	0	1	0	1	0	2
Para-Dichlorobenzene	2	1	0	0	2	1
Phosphine	0	1	0	0	0	1
Quaternary Ammonia	14	1	21	2	36	5
Sodium Chlorite	3	0	0	0	3	0

Pesticide <sup>3</sup>	Systemic/ Respiratory <sup>4</sup>		Topical <sup>4</sup>		Total	
	Definite/ Probable	Possible	Definite/ Probable	Possible	Definite/ Probable	Possible
Sodium Hypochlorite	40	4	32	1	87	6
Strychnine	1	0	0	0	1	0
Sulfur	2	0	2	0	5	0
Sulfuryl Fluoride	2	2	0	0	2	2
Thymol	1	1	0	0	1	1
Trichloromelamine	0	0	0	0	1	0
Trisodium Phosphate	0	0	0	0	0	1
Zinc Phosphide	2	1	0	0	2	1
Combinations of Antimicrobials	14	3	10	1	51	6
Combinations of Fumigants	7	0	11	0	20	0
Combinations of Fungicides	5	0	2	0	10	0
Combinations of Herbicides	27	15	12	1	39	16
Combinations of Insecticides Without ChE Inhibitor(s)	58	22	11	4	94	27
Miscellaneous Combinations	121	5	8	4	171	10
Unknown Antimicrobials	4	0	8	0	15	0
Unknown Herbicides	4	1	2	0	7	1
Unknown Insecticides	21	12	7	0	40	15
Unknown Pesticides	8	4	1	0	9	4
<b>TOTAL</b>	<b>423</b>	<b>98</b>	<b>162</b>	<b>18</b>	<b>730</b>	<b>129</b>

**1. Source:** California Department of Pesticide Regulation, Pesticide Illness Surveillance Program.

**2. Associated With:** Includes cases classified as definitely, probably, or possibly related to pesticide exposure.

**Definite:** High degree of correlation between pattern of exposure and resulting symptomatology. Requires both medical evidence (e.g., measured cholinesterase inhibition, positive allergy tests, characteristic signs observed by medical professional) and physical evidence of exposure (e.g., environmental and/or biological samples, exposure history) to support the conclusions.

**Probable:** Relatively high degree of correlation exists between the pattern of exposure and the resulting symptomatology. Either medical or physical evidence is inconclusive or unavailable.

Possible: Health effects correspond generally to the reported exposure, but evidence is not available to support a Definite or Probable relationship.

**3. Type of Pesticide:** Type of pesticide based on functional class.

Antimicrobials: Pesticides used to kill or inactivate microbiological organisms (e.g., bacteria, viruses).

Cholinesterase Inhibitors: Pesticides known to inhibit the function of the cholinesterase enzyme.

Other Pesticides: Any pesticide that is not an antimicrobial or cholinesterase-inhibiting pesticide.

**4. Type of Illness:** Categorization of the type of symptoms experienced.

Systemic: Any health effects not limited to the respiratory tree, skin, and/or eyes. Cases involving multiple illness symptom types including systemic symptoms are included in the systemic category.

Respiratory: Health effects involving any part of the respiratory tree.

Topical: Health effects involving only the eyes and/or skin. This excludes outward physical signs (e.g., miosis, lacrimation) related to effects on internal bodily systems. These signs are classified under ‘Systemic.’

Asymptomatic: Exposure occurred, but did not result in illness/injury. Cholinesterase depression without symptoms falls in this category.

**Whom to Contact:**

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**About the Pesticide Illness Surveillance Program Data**

Pesticide-related illnesses have been tracked within the state of California for more than 50 years. The California Environmental Protection Agency, Department of Pesticide Regulation (DPR) maintains a surveillance program which records human health effects of pesticide exposure. The Pesticide Illness Surveillance Program (PISP) documents information on adverse effects from pesticide products, whether elicited by the active ingredients, inert ingredients, impurities, or breakdown products. This program maintains a database, which is utilized for evaluating the circumstances of pesticide exposures resulting in illness. This database is consulted regularly by staff who evaluate the effectiveness of the DPR pesticide safety programs and recommend changes when appropriate.