

Appendix G

The Environmental Protection Agency's Revised National and State Use and Usage Summary (SUUM) for Malathion



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

August 23, 2018

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

MEMORANDUM

SUBJECT: Malathion (057701) Revised National and State Use and Usage Summary

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Malathion: Revised National and State Use and Usage Summary

(August 22, 2018)

Introduction

This document is a revision of the March 28, 2018 document titled “Malathion: National and State Use and Usage Summary”. Per our previous discussions with the interagency Endangered Species Act (ESA) Workgroup, the California percent crop treated (PCT) estimates in Table 2 have been recalculated. This is necessary due to PCT underestimates reported in California Pesticide Use Reports (PUR) as a function of data collection methodology. In the March 28, 2018 document, site specific California PCTs were obtained from the California Pesticide Use Report (PUR). Unlike the previous document, the PCT values for each site are now calculated using the PUR estimate for base acres treated (BAT) divided by the crop acres grown (CAG) estimate from either the California Agricultural Statistics Review (CASR) or California County Agricultural Commissioner’ Reports (CCACR). CASR provides the primary estimate of CAG where available. In instances where a CASR does not provide a CAG estimate, CCACR is used as the secondary source of CAG in determining PCT for malathion usage.

The Environmental Protection Agency (EPA) has been working with the United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) to develop a method for assessing the risks of pesticides to endangered and threatened species. Given that many listed species range over large areas, it is necessary to consider use of pesticides on a landscape scale, rather than simply a field or a small watershed. One consideration involves the percent of the crop in a given area (relevant to a listed species' range) that is treated with a pesticide. There are uncertainties in extrapolating from national level usage data to regional and state level ranges of protected species. In particular, national level data does not distinguish if there are areas of a species' range where usage is greater or less than the average national usage. In order to address these concerns, this document provides all available estimates of pesticide usage data for malathion, nationally and by state. All registered use sites as of March 2018 are listed although usage data are not available for every site.

The intended use of the data presented here is to inform assumptions about how malathion is used in the United States, and the extent, variability, and rate of that usage at the state-level. Pesticide usage data are reported at the state-level; usage data at smaller levels may not be statistically valid due to reduced sample size. Extent and variability of usage at the state-level are presented using minimum, maximum, and average percent crop treated (PCT) over the five-year observation period (Table 2). PCT is calculated as the percent of the acres grown for a crop (CAG) that are treated with malathion. Additionally, the data may inform assumptions about crops and states where malathion is likely not being used, by identifying crops that are surveyed for but where usage is not observed during the observation period. The state-level estimates of pesticide usage presented here (especially PCT) can be used to inform estimates of the proportion of a species range that may be exposed to malathion.

The pesticide usage data summarized herein were obtained from both public and private (proprietary) sources. As presented, the data are not proprietary, business confidential, or a trade

secret. The most recent five years of available data were used, 2011-2015, in order to more accurately current usage. Additionally, Figure 1 presents the malathion usage trend for the 1998-2015 reporting period.

Data Sources

- **Agricultural Market Research Data (AMRD)** – proprietary pesticide usage data from 1998 to 2015 for historical use trend and 2011 to 2015 for current usage estimates. These data are collected and sold by a private market research firm. The data are collected by annual surveys of agricultural users in the continental United States and provides pesticide usage data for about 60 crops, including both specialty and row crops. The survey design targets at least 80 percent of US acreage/production of the surveyed commodities. Survey methodology provides statistically valid results, typically at the state-level.
- **United States Department of Agriculture’s National Agricultural Statistics Service (NASS)** – publicly available pesticide usage data from 2011 to 2015. NASS data are based on surveys that focus on the top-producing states that together account for the majority of U.S. acres or production of the surveyed commodity. NASS survey design targets a minimum of 80 percent of the acreage/production for every fruit, vegetable, and field crop surveyed. Operation level data are combined during summary and, pending compliance with disclosure rules, published at the state and national levels. NASS does not collect data annually for each crop, but surveys for various commodities on a rotating schedule.
- **California Department of Pesticide Regulation (CADPR) Pesticide Use Reporting (PUR)** – publicly available pesticide usage data for 2011 to 2015. The PUR database contains detailed records and summaries of agricultural applications of pesticides on crops based on application permits. All agricultural growers must submit their production agricultural pesticide use reports monthly and pest control businesses must submit pesticide use reports within 7 days after application. As such, CADPR data is a census of all usage rather than a survey. The Pesticide Use Summary reports are published annually.
- **California Agricultural Statistics Review (CASR)** – publicly available California crop production data for 2011-2015. CASR data is used as the primary source for CAG data when calculating PCT estimates for California crops and is based on acres planted.
- **California County Agricultural Commissioners’ Report (CCACR)** – publicly available California crop production data for 2011-2015. CCACR data is used as a secondary source to calculate California crop PCT estimates in instances where CASR data are not available. PCT estimates using CCACR data are based on acres harvested.
- **Non-Agricultural Market Research Data (NMRD)** - Proprietary data source that provides market data for agrochemicals/specialty pesticides for various market sectors, including professional turf and ornamental plants, professional pest control, consumer pesticides, and vegetation management. Market reports reflect usage by class/market segment and chemical and are based on sales information (manufacturer and retail) and end-user surveys. Study dates vary by market sector.

The presented usage data are averaged over the number of years of available survey data based on sampling frequency (five years for AMRD and CADPR, and 1-2 years for NASS and NMRD), regardless of whether usage is observed in each surveyed year. The presented data may thus

underestimate the maximum yearly usage. In certain cases, data are unavailable or withheld. These cases are indicated in the tables:

- Some data sources do not provide all data elements. When a data element is not available, this is indicated with a "--" notation in the relevant column.
- In some cases, not enough samples are available to establish a robust average. This is indicated with the notation "Insufficient number of reports to establish an estimate". Generally, this indicates that the chemical is only periodically used by a small number of users.
- If a registered use site is surveyed by one of our data sources but no usage is observed, this is indicated with the notation "Surveyed but no usage reported" across the data columns. Lack of reported usage data for the pesticide on a surveyed crop indicates that there is a very low likelihood that the given pesticide is used on that crop.
- If a registered use site is not surveyed nationally by any of our data sources, this is indicated with the notation "Not Surveyed at National Level" across the data columns.

Summary

Nationally, agricultural malathion usage has decreased in terms of both pounds applied and total acres treated since 1998. Total agricultural acres treated with malathion has decreased by 75%, and annual pounds applied agriculturally has decreased 61% since its peak in 1998. (Figure 1). During the most recent five years of available survey data (2011 - 2015), an annual average of approximately 856,000 pounds of malathion were applied to an approximate average of 685,000 acres of agricultural crops, (Table 1), in 38 states (Table 2). Approximately 85% of the pounds of malathion applied agriculturally are to eight crops: oranges, alfalfa, winter wheat, strawberries, cherries, caneberries, walnuts, and cotton. In terms of total acres treated, approximately 85% of the acres treated with malathion are for nine crops: alfalfa, oranges, winter wheat, cherries, strawberries, cotton, caneberries, walnuts, and lettuce. The remaining 15% of malathion usage is spread over 138 other crops. Further information on national usage of malathion by crop is available in Table 1. While the majority of malathion is only applied to a handful of crops, examination of the percent of individual crops grown by state that are treated with malathion indicates that it is an important pest control tool for certain crops in certain states. Further information on percent of crops treated with malathion by state is available in Table 2. Overall, yearly average agricultural application of malathion from 2011 to 2015 was approximately 1 million pounds.

National non-agricultural usage data is more limited than agricultural data. However, available survey data indicates that more pounds of malathion are applied to non-agricultural than agricultural use sites. Summation of malathion usage across all non-agricultural sites and based on the most recent year of reported usage indicates approximately 1.7 million pounds of malathion applied annually to non-agricultural sites. Consumer application (garden, lawn, ornamental, and non-plant) and mosquito control application account for approximately 85% of non-agricultural malathion usage (Table 3).

Agricultural Usage

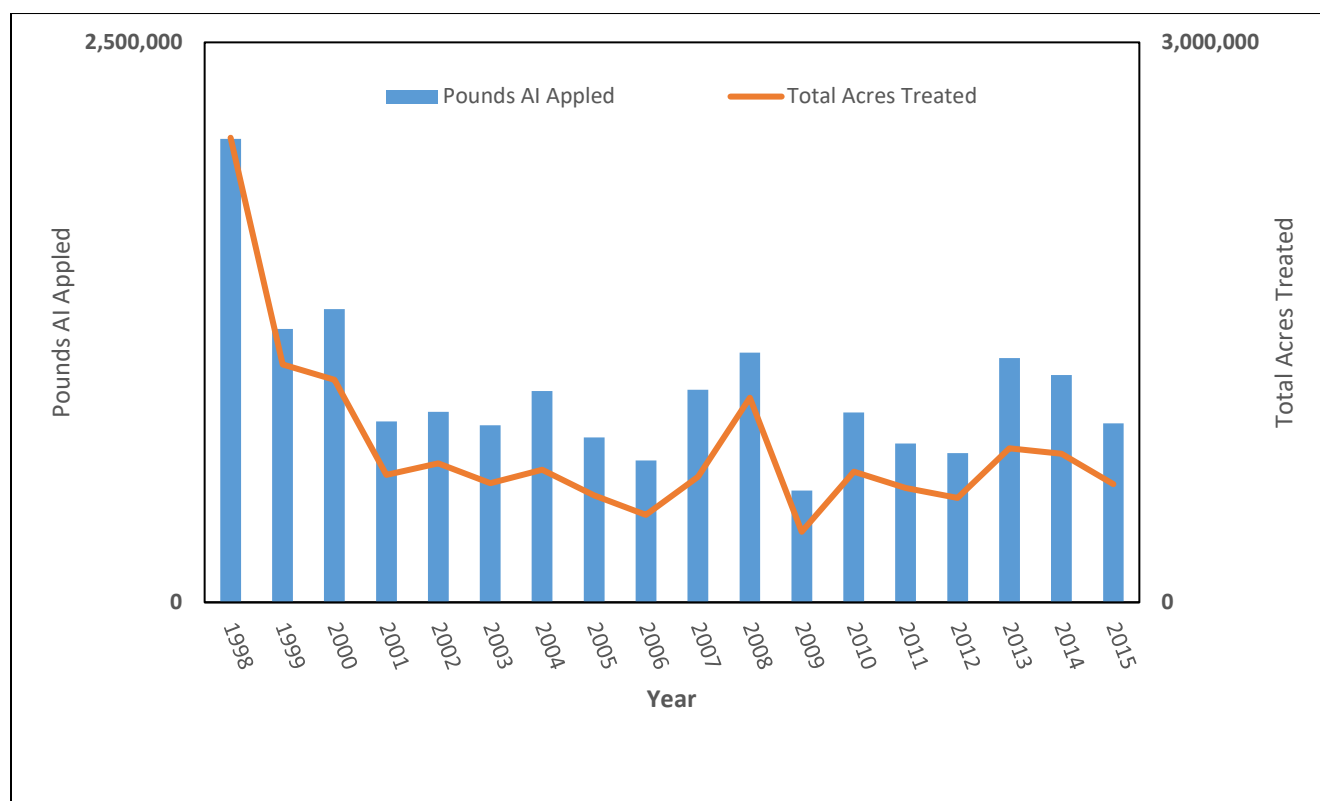


Figure 1: Malathion Total Acres Treated and Total Pounds A.I. Applied (1998-2015).

Source: Agricultural Market Research Data (AMRD). 2011-2015. (Does not include usage data for crops surveyed only by other data sources)

Table 1. National Malathion Agricultural Usage by Crop (Data Averaged Over Reported Years).

Crop	Data Source	States with Reported Usage	Avg. Annual Pounds AI Applied ^a	Avg. Annual Total Acres Treated ^b	% Applied by Air	Avg. Single AI Rate	Max Single Labeled Rate lb/a ^d
Root and Tuber Vegetables (including leaves)	See individual crops below						Full Group Not Registered
Beets (Garden/Table)	Not Surveyed at National Level						1.25
Carrots	AMRD (2011-2015)	CA	500	300	19	1.600 ^c	1.25
Chayote roots	Not Surveyed at National Level						1.56
Horseradish	Not Surveyed at National Level						1.25

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Crop	Data Source	States with Reported Usage	Avg. Annual Pounds AI Applied ^a	Avg. Annual Total Acres Treated ^b	% Applied by Air	Avg. Single AI Rate	Max Single Labeled Rate lb/a ^d
Parsnip	Not Surveyed at National Level						1.25
Potatoes	AMRD (2011-2015)	ID, MN, MT	1,200	1,100	98	1.03	1.56
Radish	Not Surveyed at National Level						1
Rutabagas	Not Surveyed at National Level						1
Salsify	Not Surveyed at National Level						1.25
Sweet Potato	Not Surveyed at National Level						1.56
Turnips	Not Surveyed at National Level						1.25
Yams	Not Surveyed at National Level						1.56
Bulb Vegetable	See individual crops below						Full Group Not Registered
Garlic	CDPR (2011-2015)	CA	137	206	65	0.663	1.56
Leeks	Not Surveyed at National Level						1.56
Onions (Bulb/Green)	AMRD (2011-2015)	CA, ID, OR, WA	10,300	6,900	9	1.468	1.56
Shallots	Not Surveyed at National Level						1.56
Leafy Vegetables (except Brassica)	See individual crops below						Full Group Not Registered
Amaranth	Not Surveyed at National Level						1.25
Arugula	Not Surveyed at National Level						1.25
Celery	CDPR (2011-2015)	CA	10,204	6,983	23	1.461	1.5
Celtuce	Not Surveyed at National Level						1.25
Chrysanthemum (Edible)	Not Surveyed at National Level						1.25
Corn Salad	Not Surveyed at National Level						1.25
Dandelion	Not Surveyed at National Level						1.25
Dock (Sorrel)	Not Surveyed at National Level						1.25
Endive	Not Surveyed at National Level						1.25
Florence fennel (Finochio)	Not Surveyed at National Level						1.25
Kale	Not Surveyed at National Level						1

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Crop	Data Source	States with Reported Usage	Avg. Annual Pounds AI Applied ^a	Avg. Annual Total Acres Treated ^b	% Applied by Air	Avg. Single AI Rate	Max Single Labeled Rate lb/a ^d
Kohlrabi	Not Surveyed at National Level						1.25
Lettuce (Leaf and Head)	AMRD (2011-2015)	AZ, CA	17,500	9,900	1	1.772	1.88
Mustard Greens	Not Surveyed at National Level						1
Mustard Spinach	Not Surveyed at National Level						1.25
Orach	Not Surveyed at National Level						1.25
Parsley	Not Surveyed at National Level						1.5
Purslane (Garden/Winter)	Not Surveyed at National Level						1.25
Radicchio	Not Surveyed at National Level						0.188
Spinach	AMRD (2011-2015)	CA	800	600	0	1.368 ^c	1
Swiss Chard	Not Surveyed at National Level						1
Watercress	Not Surveyed at National Level						1.25
Brassica (Cole) Leafy Vegetables	See individual crops below						1.25
Broccoli	CDPR (2011-2015)	CA	14,513	10,558	30	1.375 ^c	1.25
Broccoli Raab / Rappini	CDPR (2011-2015)	CA	366	205	51	1.778 ^c	1.25
Brussels sprout	CDPR (2011-2015)	CA	2,102	1,484	4	1.416 ^c	1.25
Cabbage	AMRD (2011-2015)	CA, FL, MI	2,000	1,700	0	1.162	1.25
Cabbage, Chinese (Bok Choy/Napa)	Not Surveyed at National Level						1.25
Cauliflower	CDPR (2011-2015)	CA	1,995	1,543	18	1.293 ^c	1.25
Cavalo Broccolo	Not Surveyed at National Level						1.25
Collards	Not Surveyed at National Level						1
Chinese broccoli (Gai lon)	Not Surveyed at National Level						1.25
Chinese mustard (Gai choy)	Not Surveyed at National Level						1.25
Mizuna	Not Surveyed at National Level						1.25

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Crop	Data Source	States with Reported Usage	Avg. Annual Pounds AI Applied ^a	Avg. Annual Total Acres Treated ^b	% Applied by Air	Avg. Single AI Rate	Max Single Labeled Rate lb/a ^d
Mustard spinach	Not Surveyed at National Level						1.25
Rape greens	Not Surveyed at National Level						1.25
Legume Vegetables	See individual crops below						Full Group Not Registered
Beans (Succulent)	AMRD (2011-2015)	Surveyed but no usage reported					0.61
Dry Beans/Peas	AMRD (2011-2015)	CA, ID, TX	1,000	1,000	0	1.000 ^c	0.61
Lima Beans	AMRD (2011-2015)	Surveyed but no usage reported					0.61
Peas (Fresh / Green / Sweet)	AMRD (2011-2015)	Surveyed but no usage reported					1
Fruiting Vegetable	See individual crops below						Full Group Not Registered
Eggplant	Not Surveyed at National Level						1.56
Okra	Not Surveyed at National Level						1.2
Peppers	AMRD (2011-2015)	CA, TX	700	500	0	1.297	1.56
Tomatillos	Not Surveyed at National Level						1.56
Tomatoes	AMRD (2011-2015)	CA, FL	5,600	4,900	0	1.141	1.56
Cucurbit Vegetables	See individual crops below						Full Group Not Registered
Chayote fruit	Not Surveyed at National Level						1.75
Cucumbers	AMRD (2011-2015)	FL	1,100	900	0	1.25	1.75
Melons	(see individual crops below)						1.873
Cantaloupe	AMRD (2011-2015)	CA, TX	400	400	91	0.994	1
Casabas	Not Surveyed at National Level						1

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Crop	Data Source	States with Reported Usage	Avg. Annual Pounds AI Applied ^a	Avg. Annual Total Acres Treated ^b	% Applied by Air	Avg. Single AI Rate	Max Single Labeled Rate lb/a ^d
Crenshaw	Not Surveyed at National Level						1
Honey Balls	Not Surveyed at National Level						1
Honeydews	NASS (2014)	Surveyed but no usage reported					1
Muskmelons	Not Surveyed at National Level						1
Persians	Not Surveyed at National Level						1
Pumpkins	AMRD (2011-2015)	CA, IL, IN, NJ, NY, OH, PA, TN, VA	1,700	1,900	6	0.91	1
Squash (Summer/Winter)	AMRD (2011-2015)	CA, GA, OH, TX	1,800	1,900	0	0.95	1.750 (summer) 1.000 (winter)
Watermelons	AMRD (2011-2015)	MS, OK, SC, TX	2,400	2,400	0	1.031	1.5
Citrus	See individual crops below						7.5 (CA)
							4.5 (non-CA)
Grapefruit	AMRD (2011-2015)	FL	6,300	5,700	41	1.098	7.5
Kumquats	Not Surveyed at National Level						4.5
Lemons	CDPR (2011-2015)	CA	145	92	0	1.571	7.5
Limes	Not Surveyed at National Level						7.5
Oranges	AMRD (2011-2015)	CA, FL	174,400	148,600	24	1.173	7.5
Tangelos	NASS (2011, 2015)	FL	550	1,000	--	0.55	7.5
Tangerines	NASS (2011, 2015)	FL, CA	16,150	19,918	--	0.811	7.5
Other citrus hybrids	Not Surveyed at National Level						7.5

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Crop	Data Source	States with Reported Usage	Avg. Annual Pounds AI Applied ^a	Avg. Annual Total Acres Treated ^b	% Applied by Air	Avg. Single AI Rate	Max Single Labeled Rate lb/a ^d
Pome Fruit	See individual crops below						Full Group Not Registered
Pears	AMRD (2011-2015)	Surveyed but no usage reported					1.25
Stone Fruits	See individual crops below						Full Group Not Registered
Apricots*	CDPR (2011-2015)	CA	2	6	0	0.415	1.5
Cherries (Sweet/Tart)	AMRD (2011-2015)	CA, OR, WA	66,500	49,200	55	1.351	1.75
Nectarines	CDPR (2011-2015)	CA	8	2	0	3.921 ^c	3
Peaches	AMRD (2011-2015)	MI, TX, WA	2,300	1,600	0	1.49	3
Berry and Small Fruit	See individual crops below						Full Group Not Registered
Bushberries	(see individual crops below)						
Blueberries	NASS (2011, 2015)	GA, MI, NJ, NC, OR, WA	75,950	70,209	NA	1.082	1.25
Currants	Not Surveyed at National Level						1.25
Gooseberries	Not Surveyed at National Level						2
Caneberries ¹	AMRD (2011-2015)	CA, OR, WA	53,600	28,300	5	1.892	2
Grapes	CDPR (2011-2015)	CA	2,041	1,288	0	1.584	1.88
Grapes (Raisin/Table)	CDPR (2011-2015)	CA	1,162	776	0	1.498	1.88
Grapes (Wine)	CDPR (2011-2015)	CA	879	512	0	1.716	1.88
Grape vines	Not Surveyed at National Level						1.888
Strawberries	AMRD (2011-2015)	CA, FL, MI, NY, OR, PA, WA	91,800	48,800	0	1.883	2

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Crop	Data Source	States with Reported Usage	Avg. Annual Pounds AI Applied ^a	Avg. Annual Total Acres Treated ^b	% Applied by Air	Avg. Single AI Rate	Max Single Labeled Rate lb/a ^d
Tree Nuts	See individual crops below						Full Group Not Registered
Chestnuts	Not Surveyed at National Level						2.5
Macadamia Nut	Not Surveyed at National Level						0.94
Pecans	AMRD (2011-2015)	AL, GA, TX	7,800	2,900	21	2.701 ^c	2.5
Walnuts	CDPR (2011-2015)	CA	14,333	6,228	16	2.301	2.5
Cereal Grains	See individual crops below						Full Group Not Registered
Barley	NASS (2011)	CA	Insufficient number of reports to establish an estimate				1.25
Corn	(see individual crops below)						1
Corn, Field	AMRD (2011-2015)	MI	500	800	0	0.625	1
Corn, Pop	Not Surveyed at National Level						1
Corn, Sweet	AMRD (2011-2015)	CA	6,200	6,100	35	1.005	1
Oats	NASS (2015)	Surveyed but no usage reported					1
Rice	AMRD (2011-2015)	AR, LA, TX	7,100	7,500	100	0.944	1.25
Rye	Not Surveyed at National Level						1
Sorghum (Milo)	AMRD (2011-2015)	TX	1,100	1,200	0	0.938	1
Wheat	AMRD (2011-2015)	CA, ID, KS, OK, TX, WA	100,700	85,700	71	1.175 ^c	1
Spring Wheat	AMRD (2011-2015)	CA, ID	8,800	9,000	0	0.979	1
Winter Wheat	AMRD (2011-2015)	CA, KS, OK, TX, WA	91,900	76,700	79	1.198 ^c	1
Wild rice	Not Surveyed at National Level						1.25

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Crop	Data Source	States with Reported Usage	Avg. Annual Pounds AI Applied ^a	Avg. Annual Total Acres Treated ^b	% Applied by Air	Avg. Single AI Rate	Max Single Labeled Rate lb/a ^d
Grass Forage, Fodder, and Hay	See individual crops below						Full Group Not Registered
Alfalfa	AMRD (2011-2015)	AZ, CA, CO, IL, IN, KS, KY, MI, NE, ND, OH, OK, PA, SD, UT, WY	155,300	166,100	17	0.935	1.25
Birdsfoot Trefoil	Not Surveyed at National Level						1.25
Grasses ²	Not Surveyed at National Level						1.25
Pasture and Rangeland	Not Surveyed at National Level						1.25
Nongrass Animal Feeds	See individual crops below						Full Group Not Registered
Clover	Not Surveyed at National Level						1.25
Lespedeza	Not Surveyed at National Level						1.25
Lupine	Not Surveyed at National Level						0.61
Vetch	Not Surveyed at National Level						1.25
Oilseed Crops	See individual crops below						Full Group Not Registered
Cotton	AMRD (2011-2015)	AR, LA, MO, OK, TX	46,800	39,600	17	1.182	2.5
Flax	Not Surveyed at National Level						0.5
Edible Fungi	See individual crops below						Full Group Not Registered
Mushrooms	Not Surveyed at National Level						1.7
Stalk Stem and Leaf Petiole Vegetables	See individual crops below						Full Group Not Registered
Asparagus	AMRD (2011-2015)	CA	2,100	2,000	0	1.037	1.25

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Crop	Data Source	States with Reported Usage	Avg. Annual Pounds AI Applied ^a	Avg. Annual Total Acres Treated ^b	% Applied by Air	Avg. Single AI Rate	Max Single Labeled Rate lb/a ^d
Tropical and Subtropical Fruit	See individual crops below						Full Group Not Registered
Avocados	CDPR (2011-2015)	CA	146	38	65	3.805	4.7
Figs	CDPR (2011-2015)	CA	781	455	59	1.716	2
Guava	Not Surveyed at National Level						1.25
Mangos	Not Surveyed at National Level						0.94
Papaya	Not Surveyed at National Level						1.25
Passion Fruit	Not Surveyed at National Level						1
Pineapples	Not Surveyed at National Level						2
Misc. Crops	See individual crops below						Full Group Not Registered
Hops	Not Surveyed at National Level						0.63
Mint	Not Surveyed at National Level						0.94
Peppermint	Not Surveyed at National Level						0.94
Spearmint	Not Surveyed at National Level						0.94

¹ Caneberries include blackberries, boysenberries, dewberries, loganberries, and raspberries.

² Grasses include Bermuda, barnyard grass, canary grass, fescue, orchardgrass, red top, timothy, and yellow foxtail

Notes	
AMRD (YEAR-YEAR)	Agricultural usage surveyed by market research firm(s)
NASS (YEAR)	Surveyed by United States Department of Agriculture National Agricultural Statistics Service
CDPR (YEAR)	Surveyed by the California Department of Pesticide Regulation. Over than 80% of crop grown in California
a	The pounds AI displayed in this document may differ from those displayed in the SLUA and other BEAD documents, because different calculation methods were used.
b	Total Acres Treated accounts for multiple applications to a single area. This may overestimate the number of acres treated as some acres are treated more than once.

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c	Malathion underwent re-registration, which culminated in a registration eligibility decision in 2009. As a result of that decision the maximum single application rate was reduced to the "Max Labeled Single AI Rate" listed for this crop. Because the malathion maximum single application rate for this crop was immediately prior to the sampling interval (2011-2015), products bearing the reduced application rate may not have entered the marketplace until after the beginning of the sampling interval and/or existing stocks of product with the higher pre-reregistration application rate were likely still being exhausted by growers during the sampling interval. For these reasons, use rate averages during the sampling interval that exceed the current labeled maximum use rates are not unexpected. The observed exceedance of the current "Max Labeled Single AI Rate" for this crop during the sampling interval is not suggestive of any exceedances of the maximum application rate by applicators. Furthermore, due to the application rate change near or during the sampling interval, the reported single application rate average cannot be considered a reliable estimate of the current average single application rate for this crop. The "Max Labeled Single AI Rate" should be considered the application rate for this crop.
d	Max labeled rate from 2017 EFED 1-3 Master Use Table.
--	Estimate not available

Table 2. Malathion Agricultural Usage by Crop and State (Data Averaged Over Reported Years).

Crop	Data Source	State	Avg. Annual Crop Acres Grown [†]	Avg. Annual Total Lbs. AI Applied ^a	Min. Annual PCT	Max. Annual PCT	Avg. Annual PCT
Root and Tuber Vegetables (including leaves)	See individual crops below						
Beets (Garden)	Not Surveyed at National Level						
	CDPR - CCACR (2011-2015)	California (21.1%) ⁺	1,067	99	3.3	20.8	7.8
Carrots	CDPR – CASR (2011-2015)	California (65.9%) ⁺	64,600	162	0.0	0.4	0.1
	AMRD (2011-2015)	MI	3,000	Surveyed but no usage reported			
		TX	1,700	Surveyed but no usage reported			
		WA	7,000	Surveyed but no usage reported			
		WI	4,800	Surveyed but no usage reported			
Chayote fruit/roots	Not Surveyed at National Level						
	CDPR - CCACR (2011-2015)	California (--%) ⁺	7	Surveyed but no usage reported			
Horseradish	Not Surveyed at National Level						
	CDPR - CCACR (2011-2015)	California (19.0%) ⁺	432	Surveyed but no usage reported			
Parsnip	CDPR - CCACR (2011-2015)	California (--%) ⁺	15	0	0.0	6.7	1.2

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Crop	Data Source	State	Avg. Annual Crop Acres Grown [†]	Avg. Annual Total Lbs. AI Applied ^a	Min. Annual PCT	Max. Annual PCT	Avg. Annual PCT
Potatoes	CDPR – CASR (2011-2015)	California (3.7%) ⁺	35,540	353	0.0	1.5	0.6
	AMRD (2011-2015)	Idaho	324,800	300	0.0	0.4	0.1
		Minnesota	47,000	800	0.0	7.1	1.4
		Montana	11,500	20	0.0	0.8	0.2
		CO	58,600	Surveyed but no usage reported			
		FL	35,000	Surveyed but no usage reported			
		ME	54,400	Surveyed but no usage reported			
		MI	45,800	Surveyed but no usage reported			
		NE	18,500	Surveyed but no usage reported			
		NY	17,400	Surveyed but no usage reported			
		NC	15,700	Surveyed but no usage reported			
		ND	82,800	Surveyed but no usage reported			
		OR	40,000	Surveyed but no usage reported			
		PA	7,700	Surveyed but no usage reported			
		TX	18,100	Surveyed but no usage reported			
		WA	164,000	Surveyed but no usage reported			
		WI	63,300	Surveyed but no usage reported			
	Radish	Not Surveyed at National Level					
CDPR - CCACR (2011-2015)		California (13.0%) ⁺	1,499	183	0.5	1.0	0.8
Rutabagas	Not Surveyed at National Level						
	CDPR - CCACR (2011-2015)	California (--) ⁺	128	Surveyed but no usage reported			
Salsify	Not Surveyed at National Level						
Sweet Potato	Not Surveyed at National Level						
	CDPR – CASR (2011-2015)	California (14.5%) ⁺	18,620	1	0.0	0.03	0.01
Turnips	Not Surveyed at National Level						
	CDPR - CCACR (2011-2015)	California (1.0%) ⁺	235	77	13.3	86.6	26.4
Yams	Not Surveyed at National Level						

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Crop	Data Source	State	Avg. Annual Crop Acres Grown [†]	Avg. Annual Total Lbs. AI Applied ^a	Min. Annual PCT	Max. Annual PCT	Avg. Annual PCT
Bulb Vegetable	See individual crops below						
Garlic	CDPR – CASR (2011-2015)	California (86.4%) ⁺	23,780	137	0.0	2.4	0.7
Leeks	Not Surveyed at National Level						
	CDPR – CCACR (2011-2015)	California (--%) ⁺	625	476	0.0	100.0	57.6
Onions	CDPR – CCACR (2011-2015)	California (25.4%) ⁺	47,382	1,834	0.4	3.1	2.0
	AMRD (2011-2015)	Idaho	8,400	500	0.0	16.5	5.4
		Oregon	19,700	6,000	4.7	26.0	12.9
		Washington	23,900	2,900	0.0	16.6	3.3
		CO	5,700	Surveyed but no usage reported			
		GA	12,700	Surveyed but no usage reported			
		NY	8,900	Surveyed but no usage reported			
		TX	9,800	Surveyed but no usage reported			
Green Onion and Shallots	Not Surveyed at National Level						
	CDPR - CCACR (2011-2015)	California (55.7%) ⁺	1,452	153	0.0	23.6	6.1
Leafy Vegetables (except Brassica)	See individual crops below						
Amaranth (Chinese spinach)	Not Surveyed at National Level						
	CDPR (2011-2015)	California (--%) ⁺	--	34	--	--	--
Arugula	Not Surveyed at National Level						
Celery	CDPR – CASR (2011-2015)	California (83.0%) ⁺	27,660	10,204	16.0	27.4	22.0
Celtuce	Not Surveyed at National Level						
Chervil	Not Surveyed at National Level						
Chrysanthemum (edible)	Not Surveyed at National Level						
	CDPR - CCACR (2011-2015)	California (--%) ⁺	53	1	0.0	1.2	0.9
Corn Salad	Not Surveyed at National Level						
	CDPR (2011-2015)	California (--%) ⁺	--	Surveyed but no usage reported			

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Crop	Data Source	State	Avg. Annual Crop Acres Grown [†]	Avg. Annual Total Lbs. AI Applied ^a	Min. Annual PCT	Max. Annual PCT	Avg. Annual PCT
Dandelion	Not Surveyed at National Level						
	CDPR (2011-2015)	California (--) ⁺	--	9	--	--	--
Dock (Sorrel)	Not Surveyed at National Level						
Endive	Not Surveyed at National Level						
	CDPR – CCACR (2011-2015)	California (62.0%) ⁺	489	45	1.6	12.6	6.7
Florence fennel	Not Surveyed at National Level						
	CDPR – CCACR (2011-2015)	California (--) ⁺	818	75	0.0	13.0	4.0
Kale	Not Surveyed at National Level						
	CDPR – CCACR (2011-2015)	California (26.9%) ⁺	4,671	488	4.5	10.7	7.1
Kohlrabi	Not Surveyed at National Level						
	CDPR - CCACR (2011-2015)	California (--) ⁺	58	23	0.0	1.0	0.5
Lettuce (leaf and head)	CDPR – CASR (2011-2015)	California (72.0%) ⁺	205,920	33,025	6.7	11.3	8.4
	AMRD (2011-2015)	Arizona	12,800	100	0.0	0.6	0.1
Mustard Greens	Not Surveyed at National Level						
	CDPR – CCACR (2011-2015)	California (10.6%) ⁺	2,432	1	0.0	0.2	0.1
Mustard Spinach	Not Surveyed at National Level						
Orach	Not Surveyed at National Level						
Parsley	Not Surveyed at National Level						
	CDPR – CCACR (2011-2015)	California (48.1%) ⁺	3,391	40	0.2	2.3	0.8
Purslane	Not Surveyed at National Level						
Radicchio	Not Surveyed at National Level						
	CDPR – CCACR (2011-2015)	California (--) ⁺	1,743	19	0.0	2.6	0.8
Swiss Chard	Not Surveyed at National Level						
	CDPR – CCACR (2011-2015)	California (--) ⁺	1,468	42	1.7	5.6	2.7

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Crop	Data Source	State	Avg. Annual Crop Acres Grown [†]	Avg. Annual Total Lbs. AI Applied ^a	Min. Annual PCT	Max. Annual PCT	Avg. Annual PCT
Watercress	Not Surveyed at National Level						
	CDPR (2011-2015)	California (31.2%) ⁺	--	354	--	--	--
Brassica (Cole) Leafy Vegetables	See individual crops below						
Broccoli	CDPR – CASR (2011-2015)	California (80.9%) ⁺	120,800	14,513	4.3	7.9	5.9
Broccoli Raab/Rappini	Not Surveyed at National Level						
	CDPR - CCACR (2011-2015)	California (--) ⁺	2,866	366	1.3	8.8	3.7
Brussels sprout	CDPR - CCACR (2011-2015)	California (96.4%) ⁺	2,342	2,102	22.9	70.2	52.2
Cabbage	CDPR – CASR (2011-2015)	California (14.9%) ⁺	13,300	2,007	8.5	14.6	10.3
	AMRD (2011-2015)	Florida	9,400	1,200	0.0	9.5	2.8
		Michigan	3,200	200	0.0	23.3	5.3
		AZ	2,900	Surveyed but no usage reported			
		CO	1,800	Surveyed but no usage reported			
		GA	5,400	Surveyed but no usage reported			
		NY	9,900	Surveyed but no usage reported			
		NC	4,000	Surveyed but no usage reported			
		TX	6,800	Surveyed but no usage reported			
		WI	3,000	Surveyed but no usage reported			
Cauliflower	CDPR – CASR (2011-2015)	California (81.7%) ⁺	32,660	1,995	1.7	6.3	4.5
Cavalo Broccolo	Not Surveyed at National Level						
Chinese broccoli (Gai lon)	Not Surveyed at National Level						
	CDPR (2011-2015)	California (--) ⁺	--	21	--	--	--
Chinese cabbage (bok choy and Nappa)	Not Surveyed at National Level						
	CDPR - CCACR (2011-2015)	California (42.7%) ⁺	6,910	1,749	8.8	30.0	14.5

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Crop	Data Source	State	Avg. Annual Crop Acres Grown [†]	Avg. Annual Total Lbs. AI Applied ^a	Min. Annual PCT	Max. Annual PCT	Avg. Annual PCT
Chinese mustard (Gai choy)	Not Surveyed at National Level						
	CDPR (2011-2015)	California (--) ⁺	--	7	--	--	--
Collards	Not Surveyed at National Level						
	CDPR - CCACR (2011-2015)	California (5.0%) ⁺	299	41	2.1	21.9	11.4
Mizuna	Not Surveyed at National Level						
Mustard Spinach	Not Surveyed at National Level						
Rape greens	Not Surveyed at National Level						
	CDPR (2011-2015)	California (--) ⁺	--	17	--	--	--
Legume Vegetables	See individual crops below						
Beans (Succulent)	CDPR – CASR (2011-2015)	California (3.5%) ⁺	5,120	148	0.0	3.8	1.3
	AMRD (2011-2015)	<i>FL</i>	42,200	Surveyed but no usage reported			
		<i>GA</i>	10,300	Surveyed but no usage reported			
		<i>IL</i>	8,300	Surveyed but no usage reported			
		<i>IN</i>	3,600	Surveyed but no usage reported			
		<i>MI</i>	19,000	Surveyed but no usage reported			
		<i>NY</i>	26,200	Surveyed but no usage reported			
		<i>NC</i>	6,600	Surveyed but no usage reported			
		<i>OR</i>	13,200	Surveyed but no usage reported			
		<i>PA</i>	12,800	Surveyed but no usage reported			
		<i>TN</i>	8,700	Surveyed but no usage reported			
		<i>TX</i>	2,600	Surveyed but no usage reported			
		<i>WI</i>	71,200	Surveyed but no usage reported			
Dry Beans/Peas	CDPR – CASR (2011-2015)	California (2.4%) ⁺	51,800	1,010	0.5	3.0	1.5
	AMRD (2011-2015)	Idaho	188,800	300	0.0	0.8	0.2
		Texas	23,600	500	0.0	8.9	2.2
		<i>CO</i>	45,400	Surveyed but no usage reported			
		<i>MI</i>	206,000	Surveyed but no usage reported			
		<i>MN</i>	156,000	Surveyed but no usage reported			
		<i>MT</i>	602,000	Surveyed but no usage reported			

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Crop	Data Source	State	Avg. Annual Crop Acres Grown [†]	Avg. Annual Total Lbs. AI Applied ^a	Min. Annual PCT	Max. Annual PCT	Avg. Annual PCT
		NE	131,000	Surveyed but no usage reported			
		NY	9,200	Surveyed but no usage reported			
		ND	970,000	Surveyed but no usage reported			
		WA	245,000	Surveyed but no usage reported			
		WI	37,200	Surveyed but no usage reported			
Lima Beans	AMRD (2011-2015)	CA (37.2%)	7,600	Surveyed but no usage reported			
		DE	11,700	Surveyed but no usage reported			
		GA	1,600	Surveyed but no usage reported			
		IL	2,400	Surveyed but no usage reported			
		MD	400	Surveyed but no usage reported			
		SC	500	Surveyed but no usage reported			
		WA	2,500	Surveyed but no usage reported			
		WI	4,200	Surveyed but no usage reported			
Peas (Fresh/Green/ Sweet)	CDPR - CCACR (2011-2015)	California (1.6%) ⁺	2,309	626	12.7	30.6	22.5
	AMRD (2011-2015)	MN	70,800	Surveyed but no usage reported			
		OR	16,700	Surveyed but no usage reported			
		WA	39,300	Surveyed but no usage reported			
		WI	37,900	Surveyed but no usage reported			
Fruiting Vegetable	See individual crops below						
Eggplant	Not Surveyed at National Level						
	CDPR - CCACR (2011-2015)	California (23.1%) ⁺	1,202	11	0.2	0.7	0.4
Okra	Not Surveyed at National Level						
	CDPR - CCACR (2011-2015)	California (17.5%) ⁺	662	Surveyed but no usage reported			
Peppers	CDPR – CASR (2011-2015)	California (32.1%) ⁺	26,740	353	0.3	1.7	1.1
	AMRD (2011-2015)	Texas	3,000	10	0.0	1.6	0.3
		AZ	1,300	Surveyed but no usage reported			
		FL	16,200	Surveyed but no usage reported			
		GA	3,700	Surveyed but no usage reported			
		NJ	3,300	Surveyed but no usage reported			
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Crop	Data Source	State	Avg. Annual Crop Acres Grown [†]	Avg. Annual Total Lbs. AI Applied ^a	Min. Annual PCT	Max. Annual PCT	Avg. Annual PCT
		NM	9,200	Surveyed but no usage reported			
		NC	2,400	Surveyed but no usage reported			
		OH	3,000	Surveyed but no usage reported			
Tomatillos	Not Surveyed at National Level						
	CDPR – CCACR (2011-2015)	California (–%) ⁺	33	Surveyed but no usage reported			
Tomato	CDPR – CASR (2011-2015)	California (74.2%) ⁺	308,180	10,672	0.3	4.1	1.7
	AMRD (2011-2015)	Florida	32,000	3,700	0.0	8.7	3.5
Cucurbit Vegetables	See individual crops below						
Cantaloupe	CDPR – CASR (2011-2015)	California (52.0%) ⁺	35,240	131	0.0	0.8	0.3
	AMRD (2011-2015)	Texas	2,500	40	0.0	7.6	1.5
		AZ	16,600	Surveyed but no usage reported			
		FL	2,900	Surveyed but no usage reported			
		GA	3,400	Surveyed but no usage reported			
		IN	1,900	Surveyed but no usage reported			
		NC	1,700	Surveyed but no usage reported			
		SC	200	Surveyed but no usage reported			
Cucumbers	CDPR – CASR (2011-2015)	California (7.0%) ⁺	3,760	59	0.1	1.6	0.7
	AMRD (2011-2015)	Florida	26,000	1,100	0.0	4.0	0.8
		DE	4,800	Surveyed but no usage reported			
		GA	10,400	Surveyed but no usage reported			
		MD	2,600	Surveyed but no usage reported			
		MI	33,700	Surveyed but no usage reported			
		MO	4,700	Surveyed but no usage reported			
		NJ	700	Surveyed but no usage reported			
		NC	11,900	Surveyed but no usage reported			
		SC	2,900	Surveyed but no usage reported			
		WA	1,800	Surveyed but no usage reported			
		WI	5,600	Surveyed but no usage reported			

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Crop	Data Source	State	Avg. Annual Crop Acres Grown [†]	Avg. Annual Total Lbs. AI Applied ^a	Min. Annual PCT	Max. Annual PCT	Avg. Annual PCT
Melons	(see individual crops below)						
Casaba	Not Surveyed at National Level						
Crenshaw	Not Surveyed at National Level						
Honey balls	Not Surveyed at National Level						
Honeydew	CDPR - CCACR (2011-2015)	California (80.8%) ⁺	13,958	24	0.0	0.8	0.2
Muskmelon	Not Surveyed at National Level						
Persian	Not Surveyed at National Level						
Pumpkins	CDPR - CCACR (2011-2015)	California (6.8%) ⁺	4,297	1,192	15.7	37.2	27.2
	AMRD (2011-2015)	Illinois	17,300	10	0.0	0.3	0.1
		Indiana	3,400	100	0.0	12.5	2.5
		New Jersey	2,400	200	0.0	26.7	5.3
		New York	6,000	90	0.0	7.7	1.5
		Ohio	7,100	1,100	0.0	38.4	7.8
		Pennsylvania	6,600	30	0.0	2.3	0.6
		Tennessee	1,800	80	0.0	23.3	4.9
		Virginia	2,200	60	0.0	7.5	1.9
		CT	1,400	Surveyed but no usage reported			
		MD	1,100	Surveyed but no usage reported			
		MA	2,000	Surveyed but no usage reported			
		MI	6,500	Surveyed but no usage reported			
		MN	2,300	Surveyed but no usage reported			
		MO	1,300	Surveyed but no usage reported			
		NM	2,000	Surveyed but no usage reported			
		NC	500	Surveyed but no usage reported			
		OR	2,100	Surveyed but no usage reported			
		TX	2,200	Surveyed but no usage reported			
		WA	2,100	Surveyed but no usage reported			
		WI	3,300	Surveyed but no usage reported			
Squash (summer and winter)	CDPR – CASR (2011-2015)	California (13.3%) ⁺	6,160	343	0.3	4.0	2.7
	AMRD (2011-2015)	Georgia	3,300	10	0.0	1.3	0.3

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Crop	Data Source	State	Avg. Annual Crop Acres Grown [†]	Avg. Annual Total Lbs. AI Applied ^a	Min. Annual PCT	Max. Annual PCT	Avg. Annual PCT	
		Ohio	1,900	900	0.0	91.8	32.5	
		Texas	1,900	700	0.0	29.2	6.9	
		CT	800	Surveyed but no usage reported				
		FL	9,100	Surveyed but no usage reported				
		MA	1,700	Surveyed but no usage reported				
		MI	6,100	Surveyed but no usage reported				
		NJ	3,100	Surveyed but no usage reported				
		NY	4,600	Surveyed but no usage reported				
		NC	3,300	Surveyed but no usage reported				
		OR	2,600	Surveyed but no usage reported				
		PA	900	Surveyed but no usage reported				
		SC	2	Surveyed but no usage reported				
		TN	300	Surveyed but no usage reported				
		WI	1	Surveyed but no usage reported				
Watermelons	CDPR – CASR (2011-2015)	California (10.4%) ⁺	10,680	143	0.0	1.3	0.5	
	AMRD (2011-2015)	Mississippi	2,200	1,000	0.0	62.1	12.4	
		Oklahoma	4,800	4	0.0	0.4	0.1	
		South Carolina	7,900	90	0.0	6.2	1.6	
		Texas	27,000	1,400	0.0	5.8	2.3	
		AL	3,400	Surveyed but no usage reported				
		AZ	2,800	Surveyed but no usage reported				
		FL	24,300	Surveyed but no usage reported				
		GA	23,300	Surveyed but no usage reported				
		IN	7,400	Surveyed but no usage reported				
		MD	700	Surveyed but no usage reported				
		MO	2,300	Surveyed but no usage reported				
		NC	7,300	Surveyed but no usage reported				
Citrus	See individual crops below							
Grapefruit	CDPR – CASR (2011-2015)	California (11.8%) ⁺	9,780	266	0.3	2.0	1.0	
	AMRD (2011-2015)	Florida	52,400	6,300	4.8	12.9	9.4	
		TX	18,300	Surveyed but no usage reported				

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Crop	Data Source	State	Avg. Annual Crop Acres Grown [†]	Avg. Annual Total Lbs. AI Applied ^a	Min. Annual PCT	Max. Annual PCT	Avg. Annual PCT
Kumquat	CDPR - CCACR (2011-2015)	California (71.3%) ⁺	93	Surveyed but no usage reported			
Lemons	CDPR – CASR (2011-2015)	California (79.6%) ⁺	45,600	145	0.0	0.4	0.2
Limes	Not Surveyed at National Level						
	CDPR - CCACR (2011-2015)	California (56.1%) ⁺	354	Surveyed but no usage reported			
Oranges	CDPR – CASR (2011-2015)	California (28.8%) ⁺	171,400	7,683	2.0	3.5	2.6
	AMRD (2011-2015)	Florida	481,800	172,700	12.1	33.2	24.5
Tangelos	CDPR - CCACR (2011-2015)	California (42.5%) ⁺	1,379	102	0.4	12.9	3.0
	NASS (2011, 2015)	Florida	4,925	550	7.0	41.0	20.3
Tangerines	CDPR - CCACR (2011-2015)	California (79.1%) ⁺	54,347	6,816	1.5	3.5	2.7
	NASS (2011, 2015)	Florida	31,238	3,400	12.0	12.0	12.0
Other Hybrids	Not Surveyed at National Level						
Pome Fruit	See individual crops below						
Pears	CDPR – CASR (2011-2015)	California (21.0%) ⁺	11,860	10	0	0.1	0.0
	AMRD (2011-2015)	OR	17,100	Surveyed but no usage reported			
		WA	23,000	Surveyed but no usage reported			
Stone Fruits	See individual crops below						
Apricots	CDPR – CASR (2011-2015)	California (83.6%) ⁺	9,560	2	0.0	0.1	0.1
Cherries (sweet and tart)	CDPR – CASR (2011-2015)	California (49.0%) ⁺	32,000	23,399	24.9	48.2	32.6
	AMRD (2011-2015)	Oregon	17,000	11,000	3.0	71.1	21.3
		Washington	42,200	17,000	6.9	29.4	16.2
		MI	45,900	Surveyed but no usage reported			
Nectarines	CDPR – CASR (2011-2015)	California (87.4%) ⁺	19,400	8	0.0	0.0	0.0

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Crop	Data Source	State	Avg. Annual Crop Acres Grown [†]	Avg. Annual Total Lbs. AI Applied ^a	Min. Annual PCT	Max. Annual PCT	Avg. Annual PCT	
Peaches	CDPR – CASR (2011-2015)	California (40.4%) ⁺	45,500	13	0.0	0.4	0.1	
	AMRD (2011-2015)	Michigan	4,100	20	0.0	3.0	0.6	
		Texas	5,100	1,600	0.0	55.0	13.6	
		Washington	2,600	700	0.0	67.2	13.4	
		AL	2,300	Surveyed but no usage reported				
		CO	700	Surveyed but no usage reported				
		GA	10,500	Surveyed but no usage reported				
		IL	1,400	Surveyed but no usage reported				
		NJ	5,300	Surveyed but no usage reported				
		NY	400	Surveyed but no usage reported				
		PA	5,000	Surveyed but no usage reported				
		SC	18,000	Surveyed but no usage reported				
Berry and Small Fruit	See individual crops below							
Bushberries	See individual crops below							
Blueberries	CDPR – CASR (2011-2015)	California (5.0%) ⁺	4,740	776	4.0	20.2	11.3	
	NASS (2011, 2015)	Georgia	44,171	23,450	54.0	55.0	54.5	
		Michigan	28,381	9,100	13.0	26.0	19.5	
		New Jersey	13,239	3,750	4.0	27.0	15.5	
		North Carolina	35,709	17,800	55.0	60.0	57.5	
		Oregon	17,775	11,750	32.0	58.0	45.0	
		Washington	15,592	10,050	32.0	75.0	53.5	
Currants	Not Surveyed at National Level							
	CDPR (2011-2015)	California (–%) ⁺	--	0	--	--	--	
Gooseberries	Not Surveyed at National Level							
Caneberries	CDPR - CCACR (2011-2015)	California (17.6%) ⁺	9,715	10,175	21.1	50.9	40.2	
	AMRD (2011-2015)	Oregon	11,800	9,500	5.1	59.8	39.0	
		Washington	9,300	26,800	0.0	87.1	51.9	
Blackberry	CDPR - CCACR (2011-2015)	California (7.8%) ⁺	1,708	1,519	6.0	60.6	25.1	

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Crop	Data Source	State	Avg. Annual Crop Acres Grown [†]	Avg. Annual Total Lbs. AI Applied ^a	Min. Annual PCT	Max. Annual PCT	Avg. Annual PCT
Boysenberry	CDPR - CCACR (2011-2015)	California (13.8%) ⁺	6	1	0.0	27.4	4.9
Loganberry	CDPR (2011-2015)	California (8.8%) ⁺	--	Surveyed but no usage reported			
Raspberry	CDPR - CCACR (2011-2015)	California (24.1%) ⁺	8,001	8,656	30.4	51.1	43.5
Grapes	CDPR – CASR (2011-2015)	California (82.5%) ⁺	917,000	2,041	0.0	0.2	0.1
Grapes (table and raisin)	CDPR – CASR (2011-2015)	California (--%) ⁺	317,400	1,162	0.1	0.3	0.2
Grapes (wine)	CDPR – CASR (2011-2015)	California (--%) ⁺	599,600	879	0.0	0.2	0.1
Grape vines (overwinter nursery stock)	Not Surveyed at National Level						
Strawberries	CDPR – CASR (2011-2015)	California (60.7%) ⁺	40,100	85,260	45.0	65.4	57.5
	AMRD (2011-2015)	Florida	9,700	700	0.0	9.8	2.5
		Michigan	700	20	0.0	5.7	1.4
		New York	1,400	50	0.0	6.0	1.4
		Oregon	2,100	1,000	16.8	60.2	37.5
		Pennsylvania	800	10	0.0	3.6	1.0
		Washington	1,200	400	0.0	39.3	10.9
Tree Nuts	See individual crops below						
Chestnuts	Not Surveyed at National Level						
	CDPR - CCACR (2011-2015)	California (13.4%) ⁺	24	Surveyed but no usage reported			
Macadamia Nut	Not Surveyed at National Level						
	CDPR (2011-2015)	California (1.4%) ⁺	230	Surveyed but no usage reported			
Pecans	CDPR – CASR (2011-2015)	California (0.6%) ⁺	3,166	459	0.0	13.2	2.8
	AMRD (2011-2015)	Arizona	14,200	2,200	0.0	4.9	1.8
		Texas	170,900	4,900	0.4	2.0	1.0
		AL	14,100	Surveyed but no usage reported			
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Crop	Data Source	State	Avg. Annual Crop Acres Grown [†]	Avg. Annual Total Lbs. AI Applied ^a	Min. Annual PCT	Max. Annual PCT	Avg. Annual PCT
		LA	3,200	Surveyed but no usage reported			
		NM	40,100	Surveyed but no usage reported			
		OK	126,700	Surveyed but no usage reported			
Walnuts	CDPR – CASR (2011-2015)	California (99.1%) ⁺	329,000	14,333	1.1	2.0	1.5
Cereal Grains	See individual crops below						
Barley	CDPR - CCACR (2011-2015)	California (2.5%) ⁺	32,552	1,337	0.9	10.5	3.6
Corn	(see individual crops below)						
Corn, Field	CDPR – CASR (2011-2015)	California (0.2%) ⁺	564,000	541	0.1	0.1	0.1
	AMRD (2011-2015)	Michigan	2,600,000	500	0.0	0.2	0.0
		AL	296,000	Surveyed but no usage reported			
		AR	648,000	Surveyed but no usage reported			
		CO	1,268,000	Surveyed but no usage reported			
		DE	186,000	Surveyed but no usage reported			
		GA	379,000	Surveyed but no usage reported			
		ID	352,000	Surveyed but no usage reported			
		IL	12,300,000	Surveyed but no usage reported			
		IN	5,980,000	Surveyed but no usage reported			
		IA	542,000	Surveyed but no usage reported			
		KS	4,490,000	Surveyed but no usage reported			
		KY	1,520,000	Surveyed but no usage reported			
		LA	542,000	Surveyed but no usage reported			
		MD	490,000	Surveyed but no usage reported			
		MN	8,440,000	Surveyed but no usage reported			
		MS	748,000	Surveyed but no usage reported			
		MO	3,400,000	Surveyed but no usage reported			
		NE	9,740,000	Surveyed but no usage reported			
		NM	122,000	Surveyed but no usage reported			
		NY	1,150,000	Surveyed but no usage reported			
		NC	878,000	Surveyed but no usage reported			

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Crop	Data Source	State	Avg. Annual Crop Acres Grown [†]	Avg. Annual Total Lbs. AI Applied ^a	Min. Annual PCT	Max. Annual PCT	Avg. Annual PCT
		ND	3,090,000	Surveyed but no usage reported			
		OH	3,710,000	Surveyed but no usage reported			
		OK	358,000	Surveyed but no usage reported			
		PA	1,460,000	Surveyed but no usage reported			
		SC	319,000	Surveyed but no usage reported			
		SD	5,640,000	Surveyed but no usage reported			
		TN	890,000	Surveyed but no usage reported			
		TX	2,150,000	Surveyed but no usage reported			
		VA	494,000	Surveyed but no usage reported			
		WA	196,000	Surveyed but no usage reported			
		WI	4,200,000	Surveyed but no usage reported			
		WY	95,000	Surveyed but no usage reported			
Corn, Pop	Not Surveyed at National Level						
Corn, Sweet	CDPR – CASR (2011-2015)	California (5.7%)+	32,340	1,633	2.8	3.6	3.2
	AMRD (2011-2015)	FL	46,100	Surveyed but no usage reported			
		GA	21,500	Surveyed but no usage reported			
		IL	17,200	Surveyed but no usage reported			
		MI	9,900	Surveyed but no usage reported			
		MN	124,000	Surveyed but no usage reported			
		NJ	7,500	Surveyed but no usage reported			
		NY	32,900	Surveyed but no usage reported			
		OH	16,000	Surveyed but no usage reported			
		OR	23,600	Surveyed but no usage reported			
		PA	14,700	Surveyed but no usage reported			
		WA	93,300	Surveyed but no usage reported			
		WY	78,300	Surveyed but no usage reported			
Oats	NASS (2015)	Surveyed but no usage reported					
	CDPR – CASR (2011-2015)	California (2.3%)+	150,000	371	0.0	0.5	0.3
Rice	CDPR – CASR (2011-2015)	California (20.9%)+	516,400	678	0.0	0.7	0.1
	AMRD (2011-2015)	Arkansas	1,262,000	700	0.0	0.4	0.1
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Crop	Data Source	State	Avg. Annual Crop Acres Grown [†]	Avg. Annual Total Lbs. AI Applied ^a	Min. Annual PCT	Max. Annual PCT	Avg. Annual PCT	
		Louisiana	424,400	6,000	0.0	2.7	1.4	
		Texas	144,400	100	0.0	0.6	0.1	
		MS	152,000	Surveyed but no usage reported				
		MO	178,200	Surveyed but no usage reported				
Rye	Not Surveyed at National Level							
	CDPR - CCACR (2011-2015)	California (0.7%)+	6,762	4	0.0	1.3	0.1	
Sorghum (Milo)	CDPR - CCACR (2011-2015)	California (0.3%)+	28,462	112	0.0	0.8	0.4	
	AMRD (2011-2015)	Texas	2,510,000	1,100	0.0	0.1	0.0	
		AR	191,600	Surveyed but no usage reported				
		CO	316,000	Surveyed but no usage reported				
		GA	48,000	Surveyed but no usage reported				
		IL	28,600	Surveyed but no usage reported				
		KS	2,850,000	Surveyed but no usage reported				
		LA	112,000	Surveyed but no usage reported				
		MO	88,000	Surveyed but no usage reported				
		NE	201,000	Surveyed but no usage reported				
		NM	112,000	Surveyed but no usage reported				
		OK	344,000	Surveyed but no usage reported				
		SD	226,000	Surveyed but no usage reported				
Wheat	CDPR – CASR (2011-2015)	California (1.0%)+	646,000	8,985	0.3	2.3	1.2	
	AMRD (2011-2015)	Idaho	1,341,000	1,500	0.0	1.2	0.2	
		Kansas	9,280,000	12,900	0.0	0.4	0.1	
		Oklahoma	5,360,000	2,400	0.0	0.4	0.1	
		Texas	5,830,000	1,100	0.0	0.1	0.0	
		Washington	2,290,000	60	0.0	0.1	0.0	
		AZ	89,600	Surveyed but no usage reported				
		AR	508,000	Surveyed but no usage reported				
		CO	2,490,000	Surveyed but no usage reported				
		GA	300,000	Surveyed but no usage reported				
		IL	718,000	Surveyed but no usage reported				
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Crop	Data Source	State	Avg. Annual Crop Acres Grown [†]	Avg. Annual Total Lbs. AI Applied ^a	Min. Annual PCT	Max. Annual PCT	Avg. Annual PCT
		IN	406,000	Surveyed but no usage reported			
		KY	590,000	Surveyed but no usage reported			
		MI	594,000	Surveyed but no usage reported			
		MN	1,410,000	Surveyed but no usage reported			
		MO	870,000	Surveyed but no usage reported			
		MT	5,560,000	Surveyed but no usage reported			
		NE	1,480,000	Surveyed but no usage reported			
		NM	433,000	Surveyed but no usage reported			
		NC	814,000	Surveyed but no usage reported			
		ND	7,460,000	Surveyed but no usage reported			
		OH	650,000	Surveyed but no usage reported			
		OR	890,000	Surveyed but no usage reported			
		SD	2,670,000	Surveyed but no usage reported			
		TN	470,000	Surveyed but no usage reported			
		VA	286,000	Surveyed but no usage reported			
Wild rice	Not Surveyed at National Level						
	CDPR - CCACR (2011-2015)	California (25.4%)+	8,228	784	1.3	5.2	3.5
Grass Forage, Fodder, and Hay	See individual crops below						
Alfalfa	CDPR – CASR (2011-2015)	California (5.39%)+	845,000	103,831	6.1	11.6	8.7
	AMRD (2011-2015)	Arizona	258,000	49,900	0.0	21.1	7.9
		Colorado	742,000	4,900	0.0	1.4	0.5
		Illinois	318,000	700	0.0	2.0	0.4
		Indiana	268,000	2,500	0.0	4.4	0.9
		Kansas	640,000	4,200	0.0	1.7	0.5
		Kentucky	201,000	1,900	0.0	2.4	0.9
		Michigan	662,000	50	0.0	0.1	0.0
		Nebraska	772,000	200	0.0	0.2	0.0
		North Dakota	1,498,000	1,800	0.0	0.7	0.1
		Ohio	330,000	50	0.0	0.1	0.0
		Oklahoma	260,000	200	0.0	0.4	0.1
		Pennsylvania	394,000	200	0.0	0.3	0.1

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Crop	Data Source	State	Avg. Annual Crop Acres Grown [†]	Avg. Annual Total Lbs. AI Applied ^a	Min. Annual PCT	Max. Annual PCT	Avg. Annual PCT	
		South Dakota	2,010,000	15,700	0.0	4.7	1.2	
		Utah	538,000	7,500	0.1	3.2	1.2	
		Wyoming	520,000	3,700	0.0	4.2	1.2	
		ID	1,060,000	Surveyed but no usage reported				
		IA	756,000	Surveyed but no usage reported				
		MN	1,020,000	Surveyed but no usage reported				
		MO	250,000	Surveyed but no usage reported				
		MT	1,870,000	Surveyed but no usage reported				
		NV	241,000	Surveyed but no usage reported				
		NM	212,000	Surveyed but no usage reported				
		NY	380,000	Surveyed but no usage reported				
		OR	388,000	Surveyed but no usage reported				
		TX	126,000	Surveyed but no usage reported				
		VA	79,000	Surveyed but no usage reported				
		WA	416,000	Surveyed but no usage reported				
		WI	520,000	Surveyed but no usage reported				
Birdsfoot Trefoil	Not Surveyed at National Level							
Grass crops (forage, hay)	(see individual crops below)							
Bermudagrass	Not Surveyed at National Level							
	CDPR - CCACR (2011-2015)	California (--) ⁺	20,560	974	0.0	9.6	4.1	
Barnyardgrass	Not Surveyed at National Level							
Canarygrass	Not Surveyed at National Level							
Fescue	Not Surveyed at National Level							
Orchardgrass	Not Surveyed at National Level							
	CDPR (2011-2015)	California (--) ⁺	--	86	--	--	--	
Red top	Not Surveyed at National Level							
Timothy	Not Surveyed at National Level							
	CDPR (2011-2015)	California (--) ⁺	--	253	--	--	--	
Yellow foxtail	Not Surveyed at National Level							
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Crop	Data Source	State	Avg. Annual Crop Acres Grown [†]	Avg. Annual Total Lbs. AI Applied ^a	Min. Annual PCT	Max. Annual PCT	Avg. Annual PCT	
Pasture and Rangeland	Not Surveyed at National Level							
	CDPR - CCACR (2011-2015)	California (--) ⁺	19,894,197	133	0.0	0.0	0.0	
Nongrass Animal Feeds	See individual crops below							
Clover (seed)	Not Surveyed at National Level							
	CDPR - CCACR (2011-2015)	California (--) ⁺	1,098	61	0.0	13.4	4.2	
Lespedeza	Not Surveyed at National Level							
Lupine	Not Surveyed at National Level							
Vetch (seed)	Not Surveyed at National Level							
	CDPR - CCACR (2011-2015)	California (--) ⁺	2,032	Surveyed but no usage reported				
Oilseed Crops	See individual crops below							
Cotton	CDPR – CASR (2011-2015)	California (3.9%) ⁺	295,800	22,334	0.1	14.5	3.6	
	AMRD (2011-2015)	Arkansas	421,000	5,900	0.0	2.8	1.0	
		Louisiana	188,000	32,500	0.0	23.0	9.5	
		Missouri	287,000	3,900	0.0	8.5	1.7	
		Oklahoma	275,000	700	0.0	1.6	0.3	
		Texas	6,234,000	3,800	0.0	0.1	0.0	
		AL	377,000	Surveyed but no usage reported				
		AZ	177,000	Surveyed but no usage reported				
		FL	111,000	Surveyed but no usage reported				
		GA	1,340,000	Surveyed but no usage reported				
		KS	41,200	Surveyed but no usage reported				
		MS	451,000	Surveyed but no usage reported				
		NC	535,000	Surveyed but no usage reported				
		SC	271,000	Surveyed but no usage reported				
		TN	310,000	Surveyed but no usage reported				
Flax	Not Surveyed at National Level							

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Crop	Data Source	State	Avg. Annual Crop Acres Grown [†]	Avg. Annual Total Lbs. AI Applied ^a	Min. Annual PCT	Max. Annual PCT	Avg. Annual PCT
Edible Fungi	See individual crops below						
Mushrooms	Not Surveyed at National Level**						
	CDPR – CASR (2011-2015)	California (–%) ⁺	19,339	0	0.0	0.0	0.0
Stalk Stem and Leaf Petiole Vegetables	See individual crops below						
Asparagus	CDPR - CCACR (2011-2015)	California (37.4%) ⁺	9,704	2,816	3.4	34.3	17.1
	AMRD (2011-2015)	MI	10,000	Surveyed but no usage reported			
		WA	5,100	Surveyed but no usage reported			
Tropical and Subtropical Fruit	See individual crops below						
Avocados	CDPR - CCACR (2011-2015)	California (81.3%) ⁺	58,642	146	0.0	0.2	0.1
Figs	CDPR – CASR (2011-2015)	California (95.8%) ⁺	7,220	781	1.0	11.1	5.3
Guava	Not Surveyed at National Level						
	CDPR - CCACR (2011-2015)	California (15.5%) ⁺	7,312	0	0.0	1.6	0.3
Mangos	Not Surveyed at National Level						
Papaya	Not Surveyed at National Level						
Passion Fruit	Not Surveyed at National Level						
Pineapples	Not Surveyed at National Level						
Misc. Crops	See individual crops below						
Hops	Not Surveyed at National Level						
	CDPR (2011-2015)	California (0.02%) ⁺	--	Surveyed but no usage reported			
Mint	Not Surveyed at National Level						
Peppermint	CDPR – CASR (2011-2015)	California (3.9%) ⁺	2,400	12	0.0	0.3	0.2
Spearmint	Not Surveyed at National Level						

Notes	
AMRD (YEAR-YEAR)	Agricultural usage surveyed by market research firm(s)
NASS (YEAR)	Surveyed by United States Department of Agriculture National Agricultural Statistics Service
CDPR (YEAR- YEAR)	Surveyed by the California Department of Pesticide Regulation. Over than 80% of crop grown in California
CDPR – CASR (YEAR – YEAR)	Surveyed by the California Department of Pesticide Regulation and California Agricultural Statistics Service.
CDPR – CCACR (YEAR – YEAR)	Surveyed by the California Department of Pesticide Regulation and California County Agricultural Commissioner' Report
+	Percent of crop grown in California
†	Crop Acres Grown (CAG) represents the total number of acres that are grown of the crop in each state. It is independent of treatment with any pesticide. CAG values for the data sources come from the following: AMRD comes from AMRD estimate, NASS comes from the 2012 Census of Agriculture, and CADPR estimates come from 2011-2015 California County Agricultural Commissioners' Reports.
a	The pounds AI displayed in this document may differ from those displayed in the SLUA and other BEAD documents, because different calculation methods were used.
--	Estimate not available

Non-Agricultural Usage

Table 3. National Malathion Non-Agricultural Usage by Crop. Data Averaged Over Reported Years.

Crop	Survey Status	Avg. Annual Pounds AI Applied ^a	Avg. Annual Total Acres Treated ^b	Max Single Labeled Rate ^c	Max Single Labeled Rate ^c	Max Single Labeled Rate ^c
				(lb AI/A)	(lb AI/ 1000 sq ft)	(lb AI/ bushel)
Forest Trees	See Sector usage below					
Christmas Tree Plantation	NASS (2009)	600	507	3.2	--	--
Pine Seed Orchard	Not surveyed at National Level**			3.2	--	--
Slash Pine	Not surveyed at National Level**			3.2	--	--
Post-Harvest	See Sector usage below					
Cull Fruit and Vegetable Dumps	Not surveyed at National Level**			--	16	--
Stored Grain (barley, corn, oats, rye, and wheat)	See Sector usage below					
Loading/Surface Treatment	NMRD (2012)	122,000	--	--	--	10
Stored Grain Facilities			--		0.6	--

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Crop	Survey Status	Avg. Annual Pounds AI Applied ^a	Avg. Annual Total Acres Treated ^b	Max Single Labeled Rate ^c	Max Single Labeled Rate ^c	Max Single Labeled Rate ^c
				(lb AI/A)	(lb AI/ 1000 sq ft)	(lb AI/ bushel)
Household/Domestic Dwellings Outdoor	See Sector usage below					
Garden, Ornamental, and Non-plant	NMRD (2012)	1,170,000	--	2.033	--	--
Outdoor Ornamentals	See Sector usage below					
Ornamental and/or Shade Trees	NASS (2009)	3,900	--	2.5	--	--
Ornamental Evergreens	NASS (2009)	6,200	--	5.2		
Ornamental Herbaceous Plants	NASS (2009)	1,800	--	2.5	--	--
Ornamental Non-Flowering Plants	NASS (2009)	2,300	--	2.5	--	--
Ornamental Woody Shrubs and Vines	NASS (2009)	7,700	--	2.5	--	--
Nurseries and Greenhouses	NMRD (2012)	27,600	--	--	--	--
Non-Agricultural Uncultivated Areas						
Fence row/Hedge Row	Not surveyed at National Level**			1.875	--	--
Mosquito Control - National (see regions below)	NMRD (2016)	188,000	4,455,000	0.5	--	--
Northeast (CT, ME, MA, NH, NJ, NY, PA, RI, VT)		800	--	--	--	--
South (AL, AR, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV)		176,700	--	--	--	--
West (AZ, CA, CO, ID, MT, NV, NM, OR, UT, WA, WY)		10,500	--	--	--	--
Northwest (IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, SD, WI)		No observed usage	--	--	--	--

Notes	
NMRD (YEAR)	Nonagricultural usage surveyed by market research firms.
NASS (YEAR)	Surveyed by United States Department of Agriculture National Agricultural Statistics Service
a	The pounds AI displayed in this document may differ from those displayed in the SLUA and other BEAD documents, because different calculation methods were used.

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b	Total Acres Treated accounts for multiple applications to a single area. This may overestimate the number of acres treated as some acres are treated more than once.
c	Max labeled rate from 2017 EFED 1-3 Master Use Table.
**	Site not surveyed at national level
--	Estimate not available