APPENDIX 1-4. Usage Data for Carbaryl – SUUM

See attached memorandum, Carbaryl (056801) National and State Summary Use and Usage Summary, from the Biological and Economic Analysis Division.

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

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

February 27, 2020

MEMORANDUM

SUBJECT: Carbaryl (056801) National and State Summary Use and Usage Summary

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Introduction

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 specie's 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 carbaryl, nationally and by state. All registered use sites as of May 2019 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 carbaryl 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. PCT is calculated as the percent of the acres grown for a crop that are treated with carbaryl. Additionally, the data may inform assumptions about crops and states where carbaryl 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 carbaryl.

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 as of May 2019 were used in order to represent current usage and the most recent use trend.

Data Sources

- **Kynetec USA, Inc. The AgroTrak Study, Database Subset (Kynetec)** – proprietary pesticide usage. 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 and national levels.
- **United States Department of Agriculture's National Agricultural Statistics Service (NASS) –** publicly available pesticide usage data. 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. 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 their application. As such, CADPR data is a census of all usage rather than a survey and is published annually.
- **Non-Agricultural Market Research Data (NMRD) -** proprietary pesticide usage data. Data covers pesticide usage in several U.S. markets, including consumer, professional pest management, turf and ornamentals, food handling establishments, stored grain, industrial vegetation, as well as specialty biocides and biopesticides. Data are collected via surveys of pest management companies, suppliers, dealers, distributors, food-handling establishments, trade associations, consumers, and retailers. Market sizes and brand shares are determined by analyses of sales and other data obtained through interviews and are believed to be sufficiently accurate for screening-level needs at the national level. 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 during the most recent five years of available data, based on sampling frequency (five years for Kynetec 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. For crops with less than 80% California production, Kynetec is the primary source of usage data. Kynetec is the primary data source as it collected annually and tends to provide the most robust usage data among the available data sources. NASS data are used for crops which are not surveyed by Kynetec data. The presented data may not be a reliable indicator of the variability in usage between individual years. In certain cases, data are unavailable or withheld. These cases are specified in the tables as follows:

- 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.
- 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

The agricultural usage trend for carbaryl since 1998 is presented in Figure 1. Nationally, among surveyed agricultural crops, carbaryl usage (both pounds applied, and total acres treated) has shown an

overall decreasing trend in pounds applied and acres treated since at least 1999. During the most recent five years of available survey data (2013 - 2017), over 700,00 pounds of carbaryl were applied to over 650,000 acres of agricultural crops annually (Table 1), in 39 states (Table 2). Approximately 50% of pounds of carbaryl applied agriculturally are made to two crops (apples and soybeans). In terms of total acres treated, approximately 50% of the acres treated with carbaryl are planted with three crops (apples, pecans, and soybeans). The remaining carbaryl applications are spread over 40 other crops. Further information on national usage of carbaryl by crop is available in Table 1. While the vast majority of carbaryl is only applied to a handful of crops, examination of the percent of individual crops grown by state that are treated with carbaryl indicates that it is an important pest control tool for certain crops in certain states. For instance, an average of 91% of asparagus in Michigan, 46% of squash in North Carolina, and 46% of potatoes in Texas are treated annually with carbaryl. Further information on percent of crops treated with carbaryl by state is available in Table 2.

National non-agricultural usage data is more limited than agricultural data. However, available survey data indicates that more carbaryl was applied annually in the non-agricultural market than the agricultural market. During the survey period, nearly 2 million pounds of carbaryl were applied non-agricultural sites including buildings, ornamentals, turf, pastures, and roadways. Further information on non-agricultural sites treated with carbaryl is available in (Table 3, 4, and 5).

Agricultural Usage

Carbaryl is an insecticide registered for use on the sites listed in the tables below. The following document presents a summary of the use and usage data that is available to the Agency on this active ingredient, during the years listed.

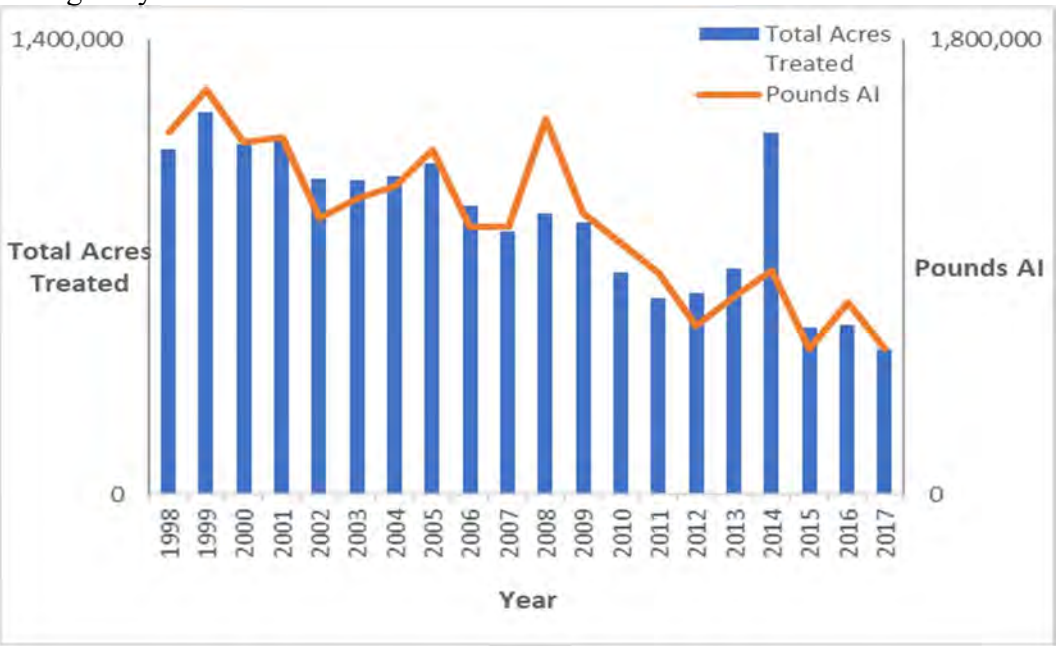

Figure 1. Carbaryl Total Acres Treated and Total Pounds A.I. Applied (1998-2017).
(Does not include usage data for crops surveyed only by NASS or CADPR, as indicated in Table 1.)
Source: *Kynetec.*1998-2017

Carbaryl: National and State Summary Use and Usage Matrix

Table 1. National Carbaryl Agricultural Usage and Use by Crop (Data Averaged and Rounded 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 [c]
Root and Tuber Vegetables	**See crops below**						**Full Crop Group Not Registered**
Root Crop Vegetables – (Garden Beets Roots, Radish, Rutabaga, and Turnip Roots)	Not Surveyed at National Level						4.00
Root & Tuber Crops - Crop Group 1 Except Sugar Beets and Sweet Potatoes	See crops below						2.04
Carrot (Tops & Roots)	Kynetec (2013 - 2017)	MI, WA	800	1,000	0%	0.79	2.04
Potato	Kynetec (2013 - 2017)	CA, FL, ID, ME, MI, MN, NY, PA, TX, WA, WI	30,000	30,000	10%	0.97	2.04
Sugar Beet	Kynetec (2013 - 2017)	ID	<500	<500	0%	0.50	1.53
Other Root and Tuber Vegetables	Not Surveyed at National Level						2.04
Leafy Vegetables	**See crops below**						**4.00**
Celery*	CADPR (2012 - 2016)	CA	<500	<500	20%	1.75	4.00
	Kynetec (2013 - 2017)	MI	<500	<500	0%	1.00	4.00
Lettuce	Kynetec (2013 - 2017)	AZ	<500	<500	0%	1.85	4.00
Spinach	Kynetec (2013 - 2017)	TX	3,000	1,000	0%	2.00	4.00
Other Leafy Vegetables	Not Surveyed at National Level						4.00
Brassica (Cole) Leafy Vegetables (5)	**See crops below**						**2.04**
Cabbage	Kynetec (2013 - 2017)	MI	<500	<500	0%	1.00	2.04
Broccoli*	CADPR (2012 - 2016)	CA	<500	<500	10%	1.55	2.04
Cauliflower*	CADPR (2012 - 2016)	CA	<500	<500	5%	1.05	2.04
Other Brassica Leafy Vegetables	Not Surveyed at National Level						2.04

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Carbaryl: National and State Summary Use and Usage Matrix

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 [c]
Legume Vegetables	**See crops below**						**2.00**
Beans (Snap, Bush, Pole, String)	Kynetec (2013 - 2017)	IN, MI, NC	2,000	2,000	0%	0.92	2.00
Lima Beans	Kynetec (2013 - 2017)	CA, SC	<500	<500	0%	0.64	2.00
Soybeans	Kynetec (2013 - 2017)	GA, NE, NC, OH TN, TX	70,000	100,000	<2.5%	0.53	2.00
Dry Beans/Peas	Kynetec (2013 - 2017)	ID	<500	<500	100%	0.50	2.00
Foliage of Legume Vegetables Used for Feed (7)	**See crops below**						**1.53**
See Beans Above	See Beans Above						
Fruiting Vegetables	**See crops below**						**2.04**
Tomatoes	Kynetec (2013 - 2017)	CA	40,000	60,000	0%	0.70	2.04
Peppers	Kynetec (2013 - 2017)	CA, NJ	1,000	2,000	0%	0.62	2.04
Other Fruiting Vegetables	Not Surveyed at National Level						2.04
Cucurbits (9)	**See crops below**						**1.02**
Cucumbers	Kynetec (2013 - 2017)	CA, NC	9,000	10,000	0%	0.87	1.02
Cantaloupes	Kynetec (2013 - 2017)	AZ, CA, IN, NC, TX	10,000	20,000	0%	0.65	1.02
Pumpkins	Kynetec (2013 - 2017)	CA, CT, IL, IN, MA, MI, MO, NJ, NY, NC, OH, OR, PA, TN, VA, WA, WI	5,000	6,000	<2.5%	0.85	1.02
Squash	Kynetec (2013 - 2017)	CA, CT, MA, MI, NJ, NY, NC, OH, PA, SC, WI	7,000	9,000	0%	0.81	1.02
Watermelons	Kynetec (2013 - 2017)	AL, AZ, CA, MS, MO, NC, OK, SC, TX	5,000	7,000	0%	0.73	1.02
Other Cucurbits	Not Surveyed at National Level						1.02

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Carbaryl: National and State Summary Use and Usage Matrix

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 [c]
Citrus (10)	**See crops below**						**12.24**
Grapefruit	Kynetec (2013 - 2017)	FL, TX	10,000	3,000	0%	3.09	12.24
Lemons*	CADPR (2012 - 2016)	CA	2,000	<500	0%	4.44	12.24
Oranges	Kynetec (2013 - 2017)	CA, FL	40,000	20,000	15%	1.90	12.24
Other Citrus	Not Surveyed at National Level						12.24
Pome Fruit (11)	**See crops below**						**3.06**
Apples	Kynetec (2013 - 2017)	CA, MI, NY, NC, OH, OR, PA, VA, WA, WV	200,000	200,000	<2.5%	2.59	3.06
Pears	Kynetec (2013 - 2017)	CA, OR	10,000	5,000	0%	2.47	3.06
Other Pome Fruit	Not Surveyed at National Level						3.06
Stone Fruit (12)	**See crops below**						**5.10**
Apricots*	CADPR (2012 - 2016)	CA	<500	<500	0%	2.43	5.10
Cherries	Kynetec (2013 - 2017)	CA, MI, OR, WA	20,000	10,000	<2.5%	2.00	5.10
Peaches	Kynetec (2013 - 2017)	AL, CA, CO, GA, IL, MI, NY, PA, SC, TX, WA	5,000	3,000	0%	1.73	5.10
Nectarines*	CADPR (2012 - 2016)	CA	<500	<500	0%	3.25	5.10
Plums*	CADPR (2012 - 2016)	CA	<500	<500	0%	3.21	5.10
Prunes*	CADPR (2012 - 2016)	CA	700	<500	35%	1.00	5.10
Other Stone Fruit	Not Surveyed at National Level						5.10
Berry and Small Fruit	**See crops below**						**Full Crop Group Not Registered**
Berries (13-07A and 13-07B)	See crops below						2.04
Blueberries	NASS (2015)	GA, MI, NC, NJ, OR	5,000	--	--	1.80	2.04
Caneberries	Kynetec (2013 - 2017)	CA, OR	<500	<500	0%	1.44	2.04
Cranberry	Not Surveyed at National Level						2.04

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Carbaryl: National and State Summary Use and Usage Matrix

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 [c]
Grapes	See crops below						2.04
Grapes, Table/Raisin *	CADPR (2012 - 2016)	CA	<500	<500	0%	1.14	2.04
Grapes, Wine*	KYNETEC (2013 - 2017)	CA, NY	6,000	4,000	5%	1.56	2.04
	CADPR (2012 - 2016)	CA	<500	<500	15%	1.33	2.04
Strawberries	Kynetec (2013 - 2017)	CA, MI, NY, OR, PA	<500	<500	0%	0.93	2.04
Tree Nuts (14)	**See crops below**						**5.10**
Almonds*	CADPR (2012 - 2016)	CA	1,000	600	20%	2.05	5.10
Pecans	Kynetec (2013 - 2017)	GA, MN, OK, TX	80,000	30,000	10%	2.53	5.10
Pistachios*	CADPR (2012 - 2016)	CA	10,000	10,000	5%	1.30	5.10 (US) 6.00 (CA)
Walnuts*	CADPR (2012 - 2016)	CA	<500	<500	15%	2.63	5.10
Hazelnuts	Kynetec (2013 - 2017)	Surveyed but no usage reported					5.10
Other Tree Nuts	Not Surveyed at National Level						5.10
Cereal Grains	**See crops below**						**Full Crop Group Not Registered**
Corn (Sweet)	Kynetec (2013 - 2017)	FL, IL, MI, MN, NJ, NY, OH, WI	8,000	8,000	<2.5%	0.94	4.00
Corn (Pop)	Not Surveyed at National Level						2.04
Corn (Field)	Kynetec (2013 - 2017)	CA, IA, KY, NC, OH	10,000	10,000	40%	0.94	2.04
Sorghum	Kynetec (2013 - 2017)	TX	<500	<500	0%	1.00	2.04
Rice	Kynetec (2013 - 2017)	CA, LA, MS	20,000	20,000	15%	1.22	1.53
Grass Forage, Fodder, And Hay Group / 18. Non-grass Animal Feeds (Forage, Fodder, Straw and Hay)	**See crops below**						**Full Crop Group Not Registered**
Alfalfa	Kynetec (2013 - 2017)	AZ, IA, MO, NV, OH, PA, WI	10,000	20,000	0%	0.60	1.53
Pastures/Rangeland	Not Surveyed at National Level						1.02

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Carbaryl: National and State Summary Use and Usage Matrix

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 [c]
Other Forage Crops: Birdsfoot Trefoil, Clover, Forage Grasses Grown for Hay and/or Seed	Not Surveyed at National Level						1.53
Oilseed Group	**See crops below**						**Full Crop Group Not Registered**
Sunflower	Kynetec (2013 - 2017)	SD, TX	2,000	2,000	95%	1.00	1.53
Flax	Not Surveyed at National Level						1.53
Stalk, Stem and Leaf Petiole Vegetable Group	**See crops below**						**Full Crop Group Not Registered**
Asparagus	Kynetec (2013 - 2017)	CA, MI, WA	20,000	30,000	<2.5%	0.73	2.04
Prickly pear Cactus Pads	Not Surveyed at National Level						2.04
Tropical and Subtropical Fruit, Edible Peel Group	**See crops below**						**Full Crop Group Not Registered**
Olive*	CADPR (2012 - 2016)	CA	8,000	2,000	5%	4.00	7.65
Misc.	**See crops below**						--
Peanuts	Kynetec (2013 - 2017)	AL, FL, NC	3,000	7,000	0%	0.48	2.04
Tobacco	Kynetec (2013 - 2017)	NC, OH, TN	1,000	1,000	0%	1.00	2.04
Shrimp Ponds, Commercial	Not Surveyed at National Level						8.01

Notes	
Kynetec (YEAR-YEAR)	Agricultural usage surveyed by market research firm(s). Values rounded.
NASS (YEAR)	Surveyed by United States Department of Agriculture National Agricultural Statistics Service. Values rounded.
CADPR (YEAR)	Surveyed by the California Department of Pesticide Regulation. Over than 80% of crop grown in California. Values rounded.
*	California crop. Over than 80% of crop grown in California. California usage is considered to be representative of National usage.
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.
c	Max labeled rate from 2017 EFED 1-3 Master Use Table.
--	Data unavailable.

Carbaryl: National and State Summary Use and Usage Matrix

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

Crop	Data Source	State	Avg. Annual Crop Acres Grown†	Avg. Annual Total Lbs. AI Applied [a]	Min. Annual PCT [b]	Max. Annual PCT [b]	Avg. Annual PCT [b]
Root and Tuber Vegetables	***See Crops Below***						
Root & Tuber Crops - Crop Group 1 Except Sugar Beets and Sweet Potatoes	*See Crops Below*						
Carrot (Including Tops & Roots)	Kynetec (2013 - 2017)	Michigan	3,000	800	0%	70%	15%
		Washington	6,000	<500	0%	<2.5%	<1%
		CA, TX, WI	70,000	Surveyed but no usage reported			
Potato	Kynetec (2013 - 2017)	Texas	20,000	10,000	0%	100%	45%
		California	30,000	4,000	0%	45%	10%
		Minnesota	40,000	5,000	0%	10%	<5%
		Wisconsin	60,000	3,000	0%	25%	5%
		Florida	30,000	1,000	0%	20%	<5%
		Michigan	50,000	1,000	<1%	10%	<5%
		Washington	200,000	3,000	0%	<5%	<1%
		Pennsylvania	6,000	<500	0%	<1%	<1%
		Idaho	300,000	<500	0%	<1%	<1%
		Maine	50,000	<500	0%	<1%	<1%
		New York	20,000	<500	0%	<1%	<1%
		CO, MT, NC, ND, NE, OR	200,000	Surveyed but no usage reported			
Radish	CADPR (2012 - 2016)	California (18%)	1,000	<500	Data withheld due to likely overcounting caused by reporting issue.		
	Not Surveyed at National Level	Other States (82%)	Not Surveyed at National Level				
Beets, Rutabaga, Turnips	CADPR (2012 - 2016)	California (NR%)	1,000 (beets); <500 (rutabaga); <500 (turnips)	Surveyed but no usage reported			
Beets, Rutabaga, Turnips	Not Surveyed at National Level	Other States (NR%)	Not Surveyed at National Level				
Sugar Beet	Kynetec (2013 - 2017)	Idaho	200,000	<500	0%	<1%	<1%
		CA, CO, MI, MN, MT, NE, ND, WY	1,000,000	Surveyed but no usage reported			
Other Root and Tuber Vegetables	Not Surveyed at National Level						

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Carbaryl: National and State Summary Use and Usage Matrix

Crop	Data Source	State	Avg. Annual Crop Acres Grown†	Avg. Annual Total Lbs. AI Applied [a]	Min. Annual PCT [b]	Max. Annual PCT [b]	Avg. Annual PCT [b]
Leafy Vegetables	***See Crops Below***						
Celery*	Kynetec (2013 - 2017)	Michigan	2,000	<500	0%	<5%	<1%
	CADPR (2012 - 2016)	California (83%)	30,000	<500	Data withheld due to likely overcounting caused by reporting issue.		
Lettuce	Kynetec (2013 - 2017)	Arizona	60,000	<500	0%	<1%	<1%
		CA	200,000	Surveyed but no usage reported			
Parsley	CADPR (2012 - 2016)	California (48%)	4,000	<500	Data withheld due to likely overcounting caused by reporting issue.		
	Not Surveyed at National Level	Other states (52%)	Not Surveyed at National Level				
Spinach	Kynetec (2013 - 2017)	Texas	2,000	3,000	0%	90%	25%
		AZ, CA, CO, NJ, OK	50,000	Surveyed but no usage reported			
Other Leafy Vegetables	Not Surveyed at National Level						
Brassica (Cole) Leafy Vegetables (5)	***See Crops Below***						
Cabbage	Kynetec (2013 - 2017)	Michigan	3,000	<500	0%	5%	<5%
		AZ, CA, CO, FL, GA, NY, NC, TX, WI	50,000	Surveyed but no usage reported			
Brussels Sprouts*	CADPR (2012 - 2016)	California (81%)	3,000	<500	Data withheld due to likely overcounting caused by reporting issue.		
Broccoli*	CADPR (2012 - 2016)	California (96%)	100,000	<500	Data withheld due to likely overcounting caused by reporting issue.		
Cauliflower*	CADPR (2012 - 2016)	California (82%)	40,000	<500	Surveyed but no usage reported		
Other Brassica Leafy Vegetables	Not Surveyed at National Level						
Legume Vegetables	***See Crops Below***						
Beans (Snap, Bush, Pole, String)	Kynetec (2013 - 2017)	North Carolina	6,000	1,000	0%	65%	15%
		Michigan	20,000	<500	0%	<5%	<1%
		Indiana	5,000	<500	0%	<2.5%	<1%
		CA, FL, GA, IL, NY, OR, PA, TN, TX, WI	200,000	Surveyed but no usage reported			

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Carbaryl: National and State Summary Use and Usage Matrix

Crop	Data Source	State	Avg. Annual Crop Acres Grown†	Avg. Annual Total Lbs. AI Applied [a]	Min. Annual PCT [b]	Max. Annual PCT [b]	Avg. Annual PCT [b]
Lima Beans	Kynetec (2013 - 2017)	California	7,000	<500	0%	10%	<2.5%
		South Carolina	800	<500	0%	50%	10%
		DE, GA, IL, MD, WA, WI	20,000	Surveyed but no usage reported			
Soybeans	Kynetec (2013 - 2017)	Texas	100,000	<500	0%	<1%	<1%
		Ohio	4,800,000	600	0%	<1%	<1%
		Nebraska	5,700,000	1,000	0%	<1%	<1%
		Georgia	200,000	3,000	0%	5%	<2.5%
		North Carolina	1,700,000	7,000	0%	<5%	<1%
		Tennessee	1,600,000	60,000	0%	35%	5%
		AL, AK, DE, IL, IN, IA, KS, KY, LA, MD, MI, MN, MS, MO, NY, ND, OK, PA, SC, SD, VA, WI	69,800,000	Surveyed but no usage reported			
Dry Beans/Peas	Kynetec (2013 - 2017)	Idaho	200,000	<500	0%	<1%	<1%
		CA, CO, MI, MN, MT, NE, NY, ND, TX, WA, WY	2,900,000	Surveyed but no usage reported			
Foliage of Legume Vegetables for Feed (7)	***See Crops Below***						
See Beans Above	*See Beans Above*						
FRUITING VEGETABLES ((8) And Non-IR4)	***See Crops Below***						
Eggplant	CADPR (2012 - 2016)	California (23%)	1,000	<500	Data withheld due to likely overcounting caused by reporting issue.		
	Not Surveyed at National Level	Other states (77%)	Not Surveyed at National Level				
Tomatoes	Kynetec (2013 - 2017)	California	300,000	40,000	10%	25%	20%
		FL	30,000	Surveyed but no usage reported			
Peppers	Kynetec (2013 - 2017)	New Jersey	4,000	<500	0%	5%	<5%
		California	30,000	1,000	0%	10%	5%
		AZ, FL, GA, NM, NC, OH, TX	30,000	Surveyed but no usage reported			
Other Fruiting Vegetables	Not Surveyed at National Level						

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Carbaryl: National and State Summary Use and Usage Matrix

Crop	Data Source	State	Avg. Annual Crop Acres Grown†	Avg. Annual Total Lbs. AI Applied [a]	Min. Annual PCT [b]	Max. Annual PCT [b]	Avg. Annual PCT [b]
Cucurbits (9)	***See Crops Below***						
Cucumbers	Kynetec (2013 - 2017)	California	10,000	<500	0%	5%	<5%
		North Carolina	10,000	9,000	0%	70%	40%
		DE, FL, GA, MD, MI, MO, NJ, SC, TX, WA, WI	90,000	Surveyed but no usage reported			
Cantaloupes	Kynetec (2013 - 2017)	Texas	3,000	<500	0%	5%	<2.5%
		Arizona	20,000	500	0%	65%	15%
		Indiana	2,000	800	0%	100%	20%
		North Carolina	2,000	600	0%	100%	25%
		California	30,000	9,000	35%	45%	40%
		FL, GA, SC	5,000	Surveyed but no usage reported			
Pumpkins	Kynetec (2013 - 2017)	Illinois	20,000	<500	0%	<1%	<1%
		New Jersey	2,000	<500	0%	20%	<5%
		Oregon	2,000	<500	0%	5%	<1%
		Missouri	1,000	<500	0%	45%	10%
		California	6,000	<500	0%	5%	<1%
		Ohio	7,000	<500	0%	<5%	<1%
		North Carolina	4,000	<500	0%	<1%	<1%
		Indiana	3,000	<500	0%	<5%	<1%
		Connecticut	1,000	<500	0%	<2.5%	<1%
		New York	5,000	600	0%	10%	5%
		Tennessee	2,000	<500	0%	35%	5%
		Wisconsin	3,000	<500	0%	20%	5%
		Virginia	2,000	<500	0%	30%	5%
		Michigan	6,000	<500	0%	15%	5%
		Pennsylvania	6,000	2,000	0%	25%	15%
		Massachusetts	2,000	600	0%	65%	15%
		Washington	2,000	<500	0%	5%	<1%
		CO, MD, MN, NM, TX	5,000	Surveyed but no usage reported			

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Carbaryl: National and State Summary Use and Usage Matrix

Crop	Data Source	State	Avg. Annual Crop Acres Grown†	Avg. Annual Total Lbs. AI Applied [a]	Min. Annual PCT [b]	Max. Annual PCT [b]	Avg. Annual PCT [b]
Squash	Kynetec (2013 - 2017)	South Carolina	2,000	<500	0%	<1%	<1%
		Ohio	2,000	<500	0%	<5%	<1%
		California	6,000	<500	0%	<5%	<2.5%
		Wisconsin	1,000	<500	0%	15%	<5%
		New York	5,000	<500	0%	20%	<5%
		Connecticut	800	<500	0%	40%	10%
		Pennsylvania	900	<500	0%	20%	5%
		New Jersey	3,000	2,000	0%	20%	10%
		Michigan	6,000	1,000	0%	50%	20%
		North Carolina	3,000	3,000	0%	75%	45%
		Massachusetts	2,000	700	0%	90%	20%
		FL, GA, OR, TN, TX	20,000	Surveyed but no usage reported			
Watermelons	Kynetec (2013 - 2017)	Texas	30,000	<500	0%	<2.5%	<1%
		South Carolina	8,000	<500	0%	<5%	<2.5%
		California	10,000	<500	0%	<2.5%	<1%
		Oklahoma	5,000	<500	0%	10%	<5%
		Arizona	3,000	<500	0%	30%	5%
		Alabama	3,000	<500	0%	15%	5%
		Missouri	3,000	<500	0%	<5%	<1%
		Mississippi	3,000	<500	0%	70%	15%
		North Carolina	7,000	4,000	0%	65%	40%
		FL, GA, IN, MD	50,000	Surveyed but no usage reported			
Other Cucurbits	Not Surveyed at National Level						
Citrus (10)	***See Crops Below***						
Grapefruit	Kynetec (2013 - 2017)	Florida	40,000	2,000	0%	<2.5%	<1%
		Texas	20,000	8000	0%	45%	10%
Lemons*	CDPR (2012 - 2016)	California (80%)	50,000	2,000	0%	<1%	<1%
	Kynetec (2013 - 2017)	*AZ, CA*	60,000	Surveyed but no usage reported			
Oranges	Kynetec (2013 - 2017)	California	200,000	10,000	0%	10%	<2.5%
		Florida	400,000	30,000	0%	10%	<5%
Tangerines*	CADPR (2012 - 2016)	California (80%)	60,000	10,000	Data withheld due to likely overcounting caused by reporting issue.		
	Not Surveyed at National Level	Other states (20%)	Not Surveyed at National Level				

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Carbaryl: National and State Summary Use and Usage Matrix

Crop	Data Source	State	Avg. Annual Crop Acres Grown†	Avg. Annual Total Lbs. AI Applied [a]	Min. Annual PCT [b]	Max. Annual PCT [b]	Avg. Annual PCT [b]
Other Citrus	Not Surveyed at National Level						
Pome Fruit (11)	***See Crops Below***						
Apples	Kynetec (2013 - 2017)	Virginia	20,000	7,000	10%	80%	45%
		New York	90,000	50,000	40%	70%	60%
		Washington	300,000	120,000	25%	65%	40%
		California	30,000	10,000	20%	50%	35%
		Michigan	80,000	20,000	15%	50%	30%
		Pennsylvania	40,000	8,000	5%	75%	30%
		Oregon	5,000	2,000	0%	75%	20%
		Ohio	5,000	1,000	0%	30%	15%
		West Virginia	1,000	700	0%	25%	10%
		North Carolina	4,000	900	0%	10%	5%
Pears	Kynetec (2013 - 2017)	California	10,000	10,000	0%	50%	30%
		Oregon	20,000	<500	0%	<2.5%	<1%
		WA	20,000	Surveyed but no usage reported			
Other Pome Fruit	Not Surveyed at National Level						
Stone Fruit (12)	***See Crops Below***						
Apricots*	CADPR (2012 - 2016)	California (84%)	9,000	<500	0%	<1%	<1%
Cherries	Kynetec (2013 - 2017)	California	40,000	2,000	<1%	<5%	<5%
		Michigan	50,000	2,000	0%	5%	<2.5%
		Oregon	20,000	5,000	0%	40%	15%
		Washington	40,000	10,000	5%	15%	10%
Peaches	Kynetec (2013 - 2017)	Georgia	10,000	<500	0%	<2.5%	<1%
		California	50,000	<500	0%	<1%	<1%
		New York	2,000	<500	0%	<5%	<1%
		Washington	3,000	<500	0%	10%	<2.5%
		Pennsylvania	5,000	<500	0%	15%	<5%
		Texas	5,000	900	0%	25%	5%
		Michigan	4,000	900	0%	20%	10%
		Colorado	3,000	1,000	0%	55%	10%
		South Carolina	20,000	<500	0%	<5%	<1%
		Illinois	2,000	800	0%	90%	30%
		Alabama	2,000	<500	0%	<5%	<1%
		NJ	5,000	Surveyed but no usage reported			

(Continued on next page)

Carbaryl: National and State Summary Use and Usage Matrix

Crop	Data Source	State	Avg. Annual Crop Acres Grown†	Avg. Annual Total Lbs. AI Applied [a]	Min. Annual PCT [b]	Max. Annual PCT [b]	Avg. Annual PCT [b]
Nectarines*	CADPR (2012 - 2016)	California (87%)	20,000	<500	Data withheld due to likely overcounting caused by reporting issue.		
Plums*	CADPR (2012 - 2016)	California (94%)	20,000	<500	0%	<1%	<1%
Prunes*	CADPR (2012 - 2016)	California (94%)	50,000	700	0%	<1%	<1%
Other Stone Fruit	Not Surveyed at National Level						
Berry and Small Fruit	***Full Crop Group Not Reg. See Crops Below***						
Berries 13-07A and 13-07B)	*See Crops Below*						
Blueberries	NASS (2011, 2015)	Michigan	19,300	1,000	0%	5%	<2.5%
		New Jersey	1,627	<500	0%	<5%	<1%
		AL, AR, CA, FL, GA, IN, ME, NY, NC, OR, WA	100,000	Surveyed but no usage reported			
Caneberries	Kynetec (2013 - 2017)	California	8,000	<500	0%	<5%	<1%
		Oregon	10,000	<500	0%	<5%	<1%
		WA	7,000	Surveyed but no usage reported			
Cranberry	Not Surveyed at National Level						
Grapes	*See Crops Below*						
Grapes, Table/Raisin*	CADPR (2012 - 2016)	California (83%)	300,000	<500	Data withheld due to likely overcounting caused by reporting issue.		
Grapes, Wine*	Kynetec (2013 - 2017)	California	600,000	700	0%	<1%	<1%
		New York	40,000	5,000	0%	20%	5%
		WA	50,000	Surveyed but no usage reported			
	CADPR (2012 - 2016)	California (83%)	600,000	<500	Data withheld due to likely overcounting caused by reporting issue.		
Strawberries	Kynetec (2013 - 2017)	California	40,000	<500	0%	<1%	<1%
		Pennsylvania	900	<500	0%	15%	<5%
		New York	1,000	<500	0%	5%	<2.5%
		Michigan	800	<500	0%	5%	<2.5%
		Oregon	2,000	<500	0%	25%	10%
		FL, WA	10,000	Surveyed but no usage reported			
Tree Nuts (14)	***See Crops Below***						
Almonds*	CADPR (2012 - 2016)	California (100%)	1,000,000	1,000	Surveyed but no usage reported		

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Carbaryl: National and State Summary Use and Usage Matrix

Crop	Data Source	State	Avg. Annual Crop Acres Grown†	Avg. Annual Total Lbs. AI Applied [a]	Min. Annual PCT [b]	Max. Annual PCT [b]	Avg. Annual PCT [b]
Pecans	Kynetec (2013 - 2017)	New Mexico	40,000	3,000	0%	10%	<2.5%
		Oklahoma	100,000	8,000	0%	<5%	<2.5%
		Georgia	100,000	40,000	<5%	10%	10%
		Texas	200,000	30,000	<5%	10%	0%
		AL, AZ, LA	20,000	Surveyed but no usage reported			
Pistachios*	CADPR (2012 - 2016)	California (98%)	300,000	10,000	Surveyed but no usage reported		
Walnuts*	CADPR (2012 - 2016)	California (99%)	400,000	<500	Surveyed but no usage reported		
Hazelnuts	Kynetec (2013 - 2017)	*OR*	40,000	Surveyed but no usage reported			
Other Tree Nuts	Not Surveyed at National Level						
Cereal Grains	***Full Crop Group Not Reg. See Crops Below***						
Corn (Sweet)	Kynetec (2013 - 2017)	Minnesota	100,000	<500	0%	<1%	<1%
		New York	30,000	<500	0%	<1%	<1%
		Wisconsin	70,000	<500	0%	<1%	<1%
		Florida	40,000	<500	0%	<1%	<1%
		Illinois	20,000	500	0%	10%	<2.5%
		Ohio	20,000	6,000	0%	50%	20%
		New Jersey	8,000	<500	0%	30%	5%
		Michigan	10,000	<500	0%	15%	<5%
		CA, GA, OR, PA, WA	200,000	Surveyed but no usage reported			
Corn (Pop)	Not Surveyed at National Level						
Corn (Field)	Kynetec (2013 - 2017)	North Carolina	900,000	<500	0%	<1%	<1%
		Iowa	14,000,000	8,000	0%	<1%	<1%
		Kentucky	1,300,000	600	0%	<1%	<1%
		Ohio	3,600,000	2,000	0%	<1%	<1%
		California	600,000	<500	0%	<1%	<1%
		AL, AK, CO, DE, GA, ID, IL, IN, KS, LA, MD, MI, MN MS, MO, NE, NM, NY, ND, OK, PA, SC, SD, TN, TX, VA, WA, WI, WY	71,500,000	Surveyed but no usage reported			

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Carbaryl: National and State Summary Use and Usage Matrix

Crop	Data Source	State	Avg. Annual Crop Acres Grown†	Avg. Annual Total Lbs. AI Applied [a]	Min. Annual PCT [b]	Max. Annual PCT [b]	Avg. Annual PCT [b]
Sorghum	Kynetec (2013 - 2017)	Texas	3,100,000	<500	0%	<1%	<1%
		AK, CO, GA, IL, KS, LA, MO, NE, NM, OK, SD,	4,800,000	Surveyed but no usage reported			
Rice	Kynetec (2013 - 2017)	California	500,000	2,000	0%	<2.5%	<1%
		Louisiana	400,000	<500	0%	<1%	<1%
		Mississippi	200,000	20,000	0%	45%	10%
		AK, MO, TX	1,800,000	Surveyed but no usage reported			
Grass Forage, Fodder, And Hay Group / 18. Non-grass Animal Feeds (Forage, Fodder, Straw and Hay)	***Full Crop Group Not Reg. See Crops Below***						
Alfalfa	Kynetec (2013 - 2017)	Ohio	400,000	2,000	0%	<2.5%	<1%
		Pennsylvania	400,000	<500	0%	<1%	<1%
		Wisconsin	1,300,000	7,000	0%	<2.5%	<1%
		Arizona	300,000	<500	0%	<1%	<1%
		Nevada	200,000	<500	0%	<1%	<1%
		Missouri	300,000	800	0%	<2.5%	<1%
		Iowa	800,000	2,000	0%	<5%	<1%
		CA, CO, ID, IL, IN, KS, KY, MI, MN, NE, ND, NM, NY, OK, OR, SD, TX, UT, VA, WA, WY	14,300,000	Surveyed but no usage reported			
Pastures/Rangeland	Not Surveyed at National Level						
Other Forage Crops: Birdsfoot Trefoil, Clover, Forage Grasses Grown for Hay and/or Seed	Not Surveyed at National Level						
Oilseed Group	***Full Crop Group Not Reg. See Crops Below***						
Sunflower	Kynetec (2013 - 2017)	South Dakota	700,000	2,000	0%	<2.5%	<1%
		Texas	100,000	<500	0%	<1%	<1%
		CO, KS, MN, NE, ND	900,000	Surveyed but no usage reported			
Flax	Not Surveyed at National Level						

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Carbaryl: National and State Summary Use and Usage Matrix

Crop	Data Source	State	Avg. Annual Crop Acres Grown†	Avg. Annual Total Lbs. AI Applied [a]	Min. Annual PCT [b]	Max. Annual PCT [b]	Avg. Annual PCT [b]
Stalk, Stem and Leaf Petiole Vegetable Group	***Full Crop Group Not Reg. See Crops Below***						
Asparagus	Kynetec (2013 - 2017)	California	10,000	600	<1%	10%	<5%
		Michigan	10,000	20,000	85%	100%	90%
		Washington	4,000	600	0%	25%	10%
Prickly Pear Cactus Pads	CADPR (2012 - 2016)	California	NR*	Surveyed but no usage reported			
Tropical and Subtropical Fruit, Edible Peel Group	***Full Crop Group Not Reg. See Crops Below***						
Olive*	CADPR (2012 - 2016)	California (97%)	40,000	8,000	Data withheld due to likely overcounting caused by reporting issue.		
Misc.	***See Crops Below***						
Peanuts	Kynetec (2013 - 2017)	Alabama	200,000	3,000	0%	5%	<2.5%
		Florida	200,000	500	0%	<2.5%	<1%
		North Carolina	90,000	<500	0%	<5%	<1%
		GA, OK, SC, TX, VA	1,000,000	Surveyed but no usage reported			
Tobacco	Kynetec (2013 - 2017)	North Carolina	200,000	500	0%	<1%	<1%
		Ohio	2,000	<500	0%	30%	5%
		Tennessee	20,000	700	0%	5%	<2.5%
		GA, KY, PA, SC, VA	100,000	Surveyed but no usage reported			
Shrimp Ponds, Commercial	Not Surveyed at National Level						

Notes	
Kynetec (YEAR-YEAR)	Surveyed by MRD Data, and Year(s) of data included. Values rounded.
NASS (YEAR)	Surveyed by NASS, and Year(s) of data included. Values rounded.
CADPR (YEAR)	Surveyed by CADPR and Year(s) of data included. Values rounded. Percent of crop grown in California included under state. Crops with reported CADPR data, but less than 80% of crop grown in California, are grown in other states, but other survey data is unavailable.
*	California crop. Over than 80% of crop grown in California. California usage is considered to be representative of National usage.
a	The PCTs displayed in this document may differ from those displayed in the SLUA and other BEAD documents, because different calculation methods were used.
b	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.
†	CAG represents the total number of acres that are grown of the crop in each state. It is independent of treatment with any pesticide.
--	Data unavailable.

Non-Agricultural Usage

Table 3. National Carbaryl Non-Agricultural Usage and Use by Crop (Data Averaged and Rounded Over Reported Years)

Use Site	Data Source	Region [d]	Avg. Annual Pounds AI Applied [a]	Avg. Annual Total Acres Treated [b]	Max Single Labeled Rate lb/a[c]
Household/Domestic Dwellings Outdoor Premises	Kline (2016)	--	1,300,000	--	9.0
External Pest Treatments Applied by Pest Management Professionals	Kline (2016)	--	20,000	--	9.0
Ornamentals (Unspecified): *Covers Trees and Plants, Woody Shrubs and Vines grown in Nurseries*	Kline (2013)	**All**	**50,000**	**20,000**	**2.0**
		Northeast	20,000	9,000	2.0
		North Central	1,000	700	2.0
		South	30,000	10,000	2.0
		Deep South	1,000	600	2.0
		West	1,000	600	2.0
Ornamental Lawns & Turf	***See Sector usage below***				
Applied by Lawn Care Operators	Kline (2013)	**All**	**100,000**	**40,000**	**8.36**
		Northeast	<500	0	8.36
		North Central	100,000	40,000	8.36
		South	7,000	3,000	8.36
		Deep South	<500	240	8.36
		West	<500	1,710	8.36
Applied by Landscape Contractors	Kline (2013)	**All**	**700**	**<500**	**8.36**
		Northeast	<500	30	8.36
		North Central	<500	140	8.36
		South	--	--	8.36
		Deep South	<500	310	8.36
		West	<500	<1	8.36
In Institutional Turf Facilities	Kline (2013)	**All**	**30,000**	**20,000**	**8.36**
		Northeast	--	--	8.36
		North Central	3,000	2,000	8.36
		South	7,000	3,000	8.36
		Deep South	20,000	10,000	8.36
		West	--	--	8.36
Golf Courses	Kline (2013)	**All**	**100,000**	**70,000**	**8.0**
		Northeast	40,000	30,000	8.0
		North Central	4,000	2,000	8.0
		South	10,000	6,000	8.0
		Deep South	60,000	30,000	8.0
		West	10,000	10,000	8.0
Ornamental Sod Farm (Turf)	Kline (2013)	**All**	**1,000**	**700**	**8.16**
		Northeast	--	--	8.16
		North Central	--	--	8.16
		South	1,000	700	8.16
		Deep South	--	--	8.16
		West	--	--	8.16

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Carbaryl: National and State Summary Use and Usage Matrix

Use Site	Data Source	Region [d]	Avg. Annual Pounds AI Applied [a]	Avg. Annual Total Acres Treated [b]	Max Single Labeled Rate lb/a[c]
Forest Trees (All or Unspecified), *Covers Forested Areas and Rangeland Trees*	See Government Agency Use Table 4 for NFS usage				2.0
Non-Cropland Uses	***See Sector usage below***				
Rangeland/Pasture	See Government Agency Use Table 4 for APHIS usage				1.02
Pasture/Rangeland (herbicide users = highly managed)	Kline (2016)	South (87% of total insecticide sales), North Central (13% of total insecticide sales); West (3% total insecticide sales	<500	--	1.02
Roadways	Kline (2016)	All	<500	--	1.02
Railways	Kline (2016)	Insecticide usage is so low that NMRD does not survey			1.02
Electrical ROWs	Kline (2016)	Insecticide usage is so low that NMRD does not survey			1.02
Other Non-Cropland Uses: *Covers Conservation Reserve Program (CRP), Set Aside Program Acreage, Wasteland, Hedgerows, Ditch banks.*	Not Surveyed at National Level				1.02

Notes	
NMRD (YEAR)	Nonagricultural usage surveyed by market research firms.
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. Totals may not add up due to rounding.
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.
d	Geographic regions based on U.S. Census Bureau regions. Northeast (ME, NH, VT, MA, CT, RI, NJ, NY, PA) North Central (ND, MN, WI, MI, OH, IN, IL, IA, ND, NE, SD, MO) West (WA, OR, CA, ID, NV, MT, WY, UT, CO, AZ, NM) South (OK, AR, TN, KY, WV, MD, DE, VA, NC) Deep South (TX, LA, MS, AL, GA, SC, FL)

Carbaryl: National and State Summary Use and Usage Matrix

Table 4. National Carbaryl Non-Agricultural Usage by Government Agencies (Data Averaged and Rounded Over Reported Years)

Use Site	Data Source	Region [d]	Avg. Annual Acres of Use Site[†]	Min. Annual PCT	Max. Annual PCT	Avg. Annual PCT
Forests	NFS (2014-2018)	Region 1	25,600,000	0	<1	<1
		Region 2	22,100,000	<1	<1	<1
		Region 3	20,800,000	0	<1	<1
		Region 4	32,000,000	<1	<1	<1
		Region 5	20,200,000	0	<1	<1
		Region 6	24,800,000	No APHIS treatments or APHIS funding.		
		Region 8	13,400,000	No APHIS treatments or APHIS funding.		
		Region 9	12,100,000	No APHIS treatments or APHIS funding.		
		Region 10	22,000,000	No APHIS treatments or APHIS funding.		
Rangeland and Pasture	APHIS (2014-2018)	Arizona	73,000,000	<1	<1	<1
		Idaho	53,500,000	<1	<1	<1
		Montana	94,100,000	0	<1	<1
		Nevada	70,800,000	0	<1	<1
		Utah	54,300,000	0	<1	<1
		Washington	43,300,000	<1	<1	<1
		California	101,200,000	No reported of usage. *		
		Colorado	66,600,000	No reported of usage. *		
		Kansas	52,700,000	No reported of usage. *		
		Nebraska	49,500,000	No reported of usage. *		
		New Mexico	77,800,000	No reported of usage. *		
		North Dakota	45,200,000	No reported of usage. *		
		Oklahoma	44,700,000	No reported of usage. *		
		Oregon	62,100,000	No reported of usage. *		
		South Dakota	49,400,000	No reported of usage. *		
		Texas	169,200,000	No reported of usage. *		
		Wyoming	62,600,000	No reported of usage. *		
Carbaryl for Tick Control on the Border	Texas Animal Health Commission (2014-2018)	No reported of usage. *				
	USDA/APHIS/ Veterinary Services (2014-2018)	No reported of usage. *				

Notes	
d	National Forest Service geographic regions: See map below
†	CAG represents the total number of acres that are grown of the crop in each state. It is independent of treatment with any pesticide
	No APHIS treatments or APHIS funding. Likely treatments made by states using APHIS data, but at rates lower than those made by APHIS or states receiving APHIS funding. Therefore, <1% should be assumed.
*	No records of usage during the noted time period.


National Forest Regions
R10
R1
R6
R4
R2
R9
R5
R3
R8