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

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

October 21, 2020

MEMORANDUM

SUBJECT: Atrazine (080803) National and State Summary Use and Usage Matrix

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Introduction

This document is an update of the Atrazine National and State Summary Use and Usage Matrix (SUUM) to include an addendum that provides additional data (aggregated PCTs) for Table 3. Atrazine Non-agricultural usage.

This document contains national and state-level use and usage data on atrazine, an herbicide registered for control of broadleaf and grass weeds in food and feed crops and non-agricultural sites such as conifers and turf grasses. National-level agricultural data are presented in Figure 1 and Table 1; state-level agricultural data are presented in Table 2; national-level non-agricultural data are presented in Table 3.

Atrazine: National and State Summary Use and Usage Matrix

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 do 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 atrazine, nationally and by state. All registered use sites as of August 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 atrazine 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 atrazine. Additionally, the data may inform assumptions about crops and states where atrazine is likely not being used, by identifying crops that are surveyed 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 atrazine.

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

Data Sources

- **Kynetec USA, Inc., The AgroTrak Study (Kynetec)–** proprietary pesticide usage data. 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 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. CASR data are used as the primary source for CAG data when calculating PCT estimates for California crops and based on acres planted.
- **California County Agricultural Commissioners' Report (CCACR) –** publicly available California crop production data. CCACR data are 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.
- **Kline and Company Data (Kline) -** 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.

Data Presentation

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 Kline), 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.

Variables are rounded as follows:

- **Average pounds of active ingredient applied and average total acres treated**– Annual average pounds of the pesticide applied and total acres treated are reported for each agricultural crop (i.e., **for surveyed states**, not for the entire United States). Values are calculated by averaging within years, averaging across years, and then rounding. Any surveyed year without reported usage for the AI is included as a value of zero pounds applied in the calculation of the average. Values are rounded using common rounding rules (i.e., the half round up method). **Note***: If the estimated value is less than 500, then that value is labeled <500. Estimated values between 500 & <1,000,000 are rounded to 1 place value. Estimated values of 1,000,000 or greater are rounded to the hundred thousands' place value. (Examples: 478 would be reported as "<500"; 43,873 would be reported as "40,000"; 47,873,901 would be reported as "47,900,000")*
- **Average percent of crop treated** - Values are calculated by averaging within years, averaging across years, and then rounding to the nearest multiple of 5. **Note**: *If the estimated value is less than 1, then the value is labeled <1. If the estimated value is less than 2.5, then the value is labeled <2.5.*
- **Maximum percent of crop treated** - Value is the single maximum annual average value reported across all years. The value is **rounded up** to the nearest multiple of 5. **Note**: *If the estimated value is less than 2.5, then the value is labeled <2.5.*

Summary

The agricultural usage trend for atrazine since 1998 is presented in Figure 1. Based on the available data, it appears that atrazine usage has remained relatively consistent over the survey period in terms of both pounds applied and acres treated. During the most recent five years of available survey data (2013-2017), an annual average of 72,000,000 pounds of atrazine were applied to an average of 75,000,000 acres of agricultural crops (Table 1). The vast majority of atrazine is applied to corn both in terms of pounds a.i. applied (87%) and acres treated (88%). Further information on percent of crops treated with atrazine by state is available in Table 2. National-level non-agricultural usage data are available in Table 3.

Agricultural Usage

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

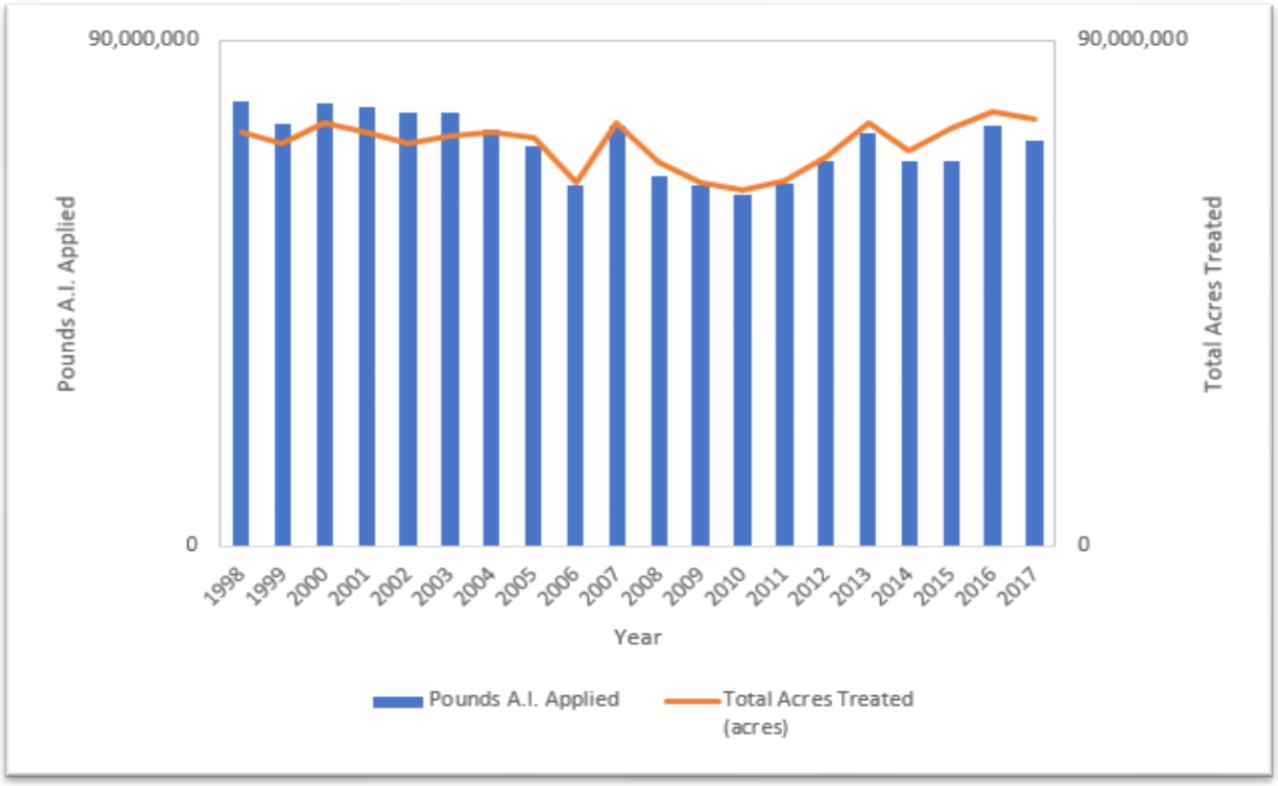

Figure 1: Atrazine Total Acres Treated and Total Pounds A.I. Applied (1998-2017).
(Does not include usage data for crops surveyed only by NASS or CADPR, as indicated in Table 1.)
Source: Kynetec USA, Inc. 2018, The AgroTrak Study, Database Subset: 1998-2017

Atrazine: National and State Summary Use and Usage Matrix

Table 1. National Atrazine Agricultural Usage by Crop (Data averaged & rounded over reported years according to rounding rules provided in the Introduction.)

Crop	Data Source	States with Reported Usage	Avg. Annual Pounds AI Applied [a]	Avg. Annual Total Acres Treated [b]	% Acres Treated by Air	Avg. Single AI Rate (lb AI/A)	Max Labeled Single AI Rate [c] (lb AI/A)
Bioenergy Crops (Perennial)	Not surveyed at national level.						0.60
Corn, field	Kynetec (2013-2017)	AL, AR, CA, CO, DE, GA, ID, IL, IN, IA, KS, KY, LA, MD, MI, MN, MS, MO, NE, NM, NY, NC, ND, OH, OK, PA, SC, SD, TN, TX, VA, WA, WI, WY	62,300,000	65,600,000	0.5%	0.95	2.00
Corn, pop	Not surveyed at national level.						1.50
Corn, silage (forage-fodder)	Not surveyed at national level.						1.50
Corn, sweet	Kynetec (2013-2017)	CA, FL, GA, IL, MI, MN, NJ, NY, OH, OR, PA, WA, WI	300,000	400,000	5%	0.82	2.00
Fallow (Chemical)	**See specific fallows below.**						
Wheat-Corn or Sorghum-Fallow	Kynetec (2013-2017)	CO, ID, KS, MT, NE, OK, OR, TX, UT, WY	1,000,000	1,100,000	1%	0.87	2.25
Wheat-Fallow-Wheat *(Includes SLNs)*							1.13
Soybean*-Corn or Sorghum *(Includes SLNs)*		IN					2.00
Soybean*, corn, or sorghum-corn or grain/forage sorghum		KS					2.00
Guava	Not surveyed at national level.						4.00
Macadamia Nuts	Not surveyed at national level.						4.00
Sorghum (milo)	Kynetec (2013-2017)	AR, CO, GA, IL, KS, LA, MO, NE, NM, OK, SD, TX	6,400,000	7,000,000	1.1%	0.91	2.00
Sorghum (forage-fodder)	Not surveyed at national level.						2.00
Sugarcane	Kynetec (2013-2016)	FL, LA	1,700,000	600,000	0%	2.55	8.00 LA only 4.00 other states

Notes	
Kynetec (YEAR-YEAR)	Agricultural usage surveyed by market research firm. Values Rounded.
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 2019 Atrazine Pesticide Label Use Summary (PLUS) Report
*	Registrant (Syngenta) proposes voluntary cancellation of fallow rotations except wheat, corn, and sorghum via letter to EPA dated 4/17/20.

Table 2. Atrazine Agricultural Usage by Crop and State (Data averaged & rounded over reported years according to rounding rules provided in the Introduction.)

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
Bioenergy Crops (Perennial)	Not surveyed at the national level.						
Corn	Kynetec (2013-2017)	AL	300,000	400,000	60%	90%	80%
		AR	700,000	800,000	70%	95%	80%
		CA	500,000	300	0%	<1%	<1%
		CO	1.200,000	700,000	40%	70%	50%
		DE	200,000	200,000	40%	100%	80%
		GA	400,000	700,000	70%	90%	80%
		ID	300,000	60,000	5%	20%	10%
		IL	11,800,000	10,200,000	70%	70%	70%
		IN	5,800,000	5,100,000	60%	70%	70%
		IA	13,800,000	8,000,000	50%	60%	60%
		KS	4,600,000	5,000,000	70%	80%	80%
		KY	1,500,000	1,400,000	60%	80%	70%
		LA	500,000	900,000	80%	100%	90%
		MD	500,000	500,000	50%	90%	80%
		MI	2,600,000	1,400,000	45%	60%	50%
		MN	8,400,000	1,200,000	10%	30%	20%
		MS	700,000	700,000	30%	90%	70%
		MO	3,400,000	4,500,000	80%	90%	80%
		NE	9,700,000	6,400,000	50%	65%	60%
		NM	100,000	20,000	10%	30%	20%
		NY	1,100,000	600,000	50%	70%	60%
		NC	900,000	1,200,000	60%	90%	80%
		ND	3,400,000	800,000	40%	50%	45%

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Atrazine: 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	Max. Annual PCT	Avg. Annual PCT
		OH	3,600,000	3,500,000	65%	75%	70%
		OK	400,000	400,000	80%	90%	90%
		PA	1,500,000	1,100,000	60%	70%	70%
		SC	300,000	500,000	80%	100%	90%
		SD	5,600,000	1,600,000	30%	50%	40%
		TN	900,000	900,000	60%	80%	70%
		TX	2,400,000	1,700,000	50%	70%	60%
		VA	500,000	600,000	65%	80%	80%
		WA	200,000	20,000	<2.5%	30%	10%
		WI	4,100,000	1,400,000	40%	50%	50%
		WY	90,000	4,000	0%	10%	<2.5%
Corn, pop	Not surveyed at the state level						
Corn, silage (forage-fodder)	CADPR-CASR (2012-2016)	CA (7%)+	400,000	3,000	Data withheld due to likely overcounting caused by reporting issue.		
	NA	Other States	Not surveyed at the state level.				
Corn, sweet	Kynetec (2013-2017)	CA	30,000	6,000	<1%	40%	10%
		FL	40,000	50,000	60%	100%	85%
		GA	20,000	30,000	80%	100%	80%
		IL	20,000	20,000	60%	90%	80%
		MI	6,000	5,000	0%	95%	50%
		MN	100,000	40,000	50%	60%	50%
		NJ	4,000	4,000	0%	100%	55%
		NY	30,000	30,000	80%	100%	90%
		OH	20,000	30,000	100%	100%	100%
		OR	20,000	20,000	80%	100%	90%
		PA	8,000	10,000	90%	95%	60%
		WA	90,000	40,000	65%	75%	70%
		WI	70,000	40,000	55%	80%	70%
Fallow (Chemical)	**See specific fallows below.**						
Wheat-Corn or Sorghum-Fallow; Wheat- Fallow-Wheat *(Includes SLNs)*	Kynetec (2013-2017)	CO	2,000,000	400,000	10%	30%	20%
		ID	200,000	<500	0%	<2.5%	<1%
		KS	3,200,000	500,000	10%	30%	20%
		MT	2,900,000	2,000	0%	<1%	<1%
		NE	900,000	30,000	<1	10%	5%
		OK	400,000	20,000	5%	10%	10%
		OR	90,000	<500	0%	<2.5%	<1%

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Atrazine: 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	Max. Annual PCT	Avg. Annual PCT
Soybean*, corn, or sorghum-corn or grain/forage sorghum *(KS SLNs)*		TX	1,000,000	6,000	0%	<2.5%	<2.5%
		UT	90,000	<500	0%	<2.5%	<1%
		WY	100,000	4,000	0%	15%	5%
	--	CA, LA, MN, ND, OR, SD, WA	2,900,000	Surveyed but no usage reported			
Soybeans*-Corn or Sorghum *(Includes SLNs)*	Kynetec (2013-2017)	IN	5,600,000	10,000	0%	<2.5%	<1%
Guava	Not surveyed at the state level						
Macadamia Nuts	Not surveyed at the state level						
Sorghum (milo)	Kynetec (2013-2017)	AR	200,000	200,000	70%	100%	90%
	CADPR-CASR (2012-2016)	CA (<1%)+	--	2,000	Data withheld due to likely overcounting caused by reporting issue.		
	Kynetec (2013-2017)	CO	400,000	200,000	15%	80%	40%
		GA	30,000	30,000	30%	90%	60%
		IL	30,000	30,000	75%	100%	90%
		KS	3,000,000	400,000	80%	90%	80%
		LA	70,000	100,000	60%	100%	90%
		MO	90,000	100,000	25%	85%	70%
		NE	200,000	100,000	40%	75%	60%
		NM	100,000	50,000	30%	60%	40%
		OK	400,000	400,000	70%	75%	70%
		SD	300,000	200,000	30%	80%	60%
		TX	2,500,000	1,500,000	40%	60%	50%
Sorghum (forage-fodder)	CADPR-CASR (2012-2016)	CA (9%)+	NA	140	Data withheld due to likely overcounting caused by reporting issue.		
	--	Other States	Not surveyed by other states.				
Sugarcane	CADPR-CASR (2012-2016)	CA (%[b])+	--	<500	Data withheld due to likely overcounting caused by reporting issue.		
	Kynetec (2013-2016)	FL	300,000	1,400,000	95%	100%	100%
		LA	300,000	300,000	20%	50%	30%
	--	Other States	Not surveyed by other states.				

Atrazine: National and State Summary Use and Usage Matrix

Notes	
Kynetec (YEAR-YEAR)	Surveyed by MRD Data, and Year(s) of data included. Values rounded.
CADPR (YEAR-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.
+	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: Kynetec comes from Kynetec estimate, NASS comes from the 2012 Census of Agriculture, and CDPR estimates come from the 2017-2018 California Agricultural Statistics Review (CASR) or 2012-2016 California County Agricultural Commissioners' Reports (CCACR).
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	Percent grown in California unavailable
--	Data unavailable.
*	Registrant (Syngenta) proposes voluntary cancellation of fallow rotations except wheat, corn, and sorghum via letter to EPA dated 4/17/20.

Non-Agricultural Usage

Table 3. Atrazine Non-agricultural Usage. (Data averaged & rounded over reported years according to rounding rules provided in the Introduction.)

Site	Data Source/Sector	Avg. Annual Pounds AI Applied[a]	Avg. Annual Acres Treated[b]	Max Single Labeled Rate (lb ai/a)[c]
Coniferous/Evergreen/Softwood*	Kline (2014) *T&O Nurseries-Greenhouses*	100,000	50,000	4.00
Conservation Reserve Program* (CRP) (NE OK, OR, TX)	Kynetec (2013-2017)	7,000	9.000	2.00
Conservation Reserve Program (CRP) (CO, FL, GA, MS, CO, NC, OH, SC)[d]	Kynetec (2013-2017)	7,000	15,000	2.00
Grass/Turf (Golf Courses)	Kline (2014) *T&O Golf Courses*	--	--	2.00
Ornamental Lawns & Turf	**See sector usage below.**			
Applied by Lawn Care Operators	Kline (2014) *T&O*	--	--	2.00
Applied by Institutional Turf Facilities	Kline (2014) *T&O*	100,000	--	
Applied by Consumers	Kline (2016) *Consumer Markets*	300,000	--	
Applied by Ornamental Sod Farms (Turf)	Kline (2014) *T&O*	100,000	100,000	4.00
Roadside Rights-of-Way*	Kline (2016) *IVM Roadways*	--	--	1.00

Notes	
Kline (YEAR)	Nonagricultural usage surveyed by market research firm. Sectors: T&O (Professional Turf & Ornamental Markets; IVM (Industrial Vegetation Management); Consumer Markets
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.

Atrazine: National and State Summary Use and Usage Matrix

Notes	
d	These states report use on pastureland but are not registered for atrazine use on pastureland under the Conservation Reserve Program.
c	Max labeled rate from 2019 Atrazine Pesticide Label Use Summary (PLUS) Report.
--	Data Unavailable
*	Registrant (Syngenta) proposes voluntary cancellation of conifer, Conservation Reserve Program and roadside uses via letter to EPA dated 4/17/20.

Attachment: Addendum

Atrazine SUUM_2020 Excel File

Atrazine: National and State Summary Use and Usage Matrix

Addendum

This addendum provides additional data for Table 3. Atrazine Non-agricultural Usage. The additional data is derived from a supplemental method for obtaining estimated aggregated PCTs using available survey data on **treatable acres and base acres treated** for some of the non-ag uses. The maximum PCT is based on the ratio of base acres treated with all herbicides to the **total treatable acres** for that site while the average PCT is based on the ratio of acres treated with the chemical (atrazine) to the **total treatable acres**. See the table below on PCT estimates for atrazine non-agricultural sites.

Atrazine Non-Agricultural PCT Estimates, 2013-2017

Site	Data Source	Treatable Acres	Base Acres Treated w/Herbicides	Acres Treated w/Atrazine	Avg. PCT[a]	Max PCT[b]
Grass/Turf (Golf Courses)	Kline (2014) *T&O*	1,700,000	1,300,000	20[d]	<1%	80%
Ornamental Lawns & Turf		*See sector usage below.*				
Applied by Lawn Care Operators	Kline (2014) *T&O*	30,000,000	3,000,000	20,000[d]	<1%	10%
Applied by Institutional Turf Facilities	Kline (2014) *T&O*	7,800,000	2,000,000	25,000[d]	<1%	25%
Applied by Consumers	Kline (2016) *Consumer Markets*	*Acre treatments not surveyed for consumer markets*			<2.5%[e]	<2.5%[e]
Applied by Ornamental Sod Farms (Turf)	Kline (2014) *T&O*	320,000	310,000	100,000	30%	97%
Roadside Rights-of-Way*	Kline (2016) *IVM Roadways*	12,000,000	6,500,000	*Surveyed but no usage reported*	<2.5[c]	50%

Notes	
Kline (YEAR)	Nonagricultural usage surveyed by market research firm. Sectors: T&O (Professional Turf & Ornamental Markets; IVM (Industrial Vegetation Management); Consumer Markets
a	Avg PCT: Calculated based on ratio of acres treated with atrazine to treatable acres.
b	Max PCT: Calculated based on ratio of base acres treated with all herbicides to treatable acres.
c	Default Assumption of <2.5% crop treated where no usage is reported.
d	Kline, 2014; C. Doucoure, Personal Communication, 2020
e	Default Assumption of <2.5% crop treated based on Kline, 2016; C. Doucoure, Personal Communication, 2020 indicating that there are likely small amounts of atrazine applied by consumers from some of the products (Southern AG, VPG, etc.).
*	Registrant (Syngenta) proposes voluntary cancellation of conifer, Conservation Reserve Program and roadside uses via letter to EPA dated 4/17/20.