

3.3 Pesticide Amount Used in the U.S.: Total

Total pesticide amount used in the United States approximated 5 billion pounds in both 2000 and 2001 (see Table 3.3). This estimate includes the conventional, other, wood preservative, specialty biocide, and chlorine/hypochlorite pesticide groups. With more than 2.5 billion pounds used, chlorine/hypochlorites exceeded all other pesticide groups combined (see Figure 3.2). The estimates of use by group rely on the estimated amount used and changes in estimated amount used by pesticide group derived from public and proprietary EPA databases. A discussion of the amount used of each pesticide group in 2000 and 2001 appears in subsequent sections (see footnotes to Table 3.3 for locations).

Table 3.3
Amount of Pesticides Used in the U.S.
by Pesticide Group, 2000 and 2001 Estimates

Pesticide Group	Total (Million Pounds)	
	2000	2001
Conventional Pesticides ¹	926	888
Other Pesticides ²	308	315
Specialty Biocides ³	353	363
Chlorine/Hypochlorites ⁴	2,532	2,609
Wood Preservatives ⁵	809	797
Total	4,928	4,972

1. See Table 3.4 (conventional pesticides) for additional details and specific source information.

2. "Other pesticides" include other chemicals used as pesticides (e.g. sulfur and petroleum oil). See Table 3.11 (other pesticides) for additional details and specific source information.

3. See Table 3.12 (specialty biocides) for additional details and specific source information.

4. See Table 3.13 (chlorine/hypochlorites) for additional details and specific source information.

5. Source: American Wood Preservatives Institute (AWPI) and EPA proprietary data.

"Wood Preservatives" include creosote, pentachlorophenol, and chromated copper arsenate (CCA).

3.4 Amount of Pesticides Used in the U.S.: Conventional

Table 3.4 shows that conventional pesticide amount used in 2000 and 2001 totaled 926 and 888 million pounds of active ingredient, respectively. This category of pesticide use was second highest among all pesticide groups in the U.S. after chlorine/hypochlorites. Table 3.4 shows the breakout of this use by pesticide type and market sector. Pesticide types in this group include herbicides, plant growth regulators, insecticides, miticides, fungicides, nematicides, fumigants, and others.¹ The amount used in the agricultural sector accounted for the majority of the total amount used in both years, with the two non-agricultural sectors (industry/commercial/government and home & garden) cumulatively accounting for less than 25% of the total use in each year (see Table 3.4). The amount used in the agriculture sector accounted for the majority of the total amount used by pesticide type in both years as well – more than 60% of the total amount used of each type, except for fungicides in 2000 (59%) and 2001 (58%). Figure 3.3 graphs the distribution of use by pesticide type and sector. The estimated use levels rely on the estimated amount used and changes in amount used of conventional pesticides by sector and type derived from public and proprietary EPA databases.

**Table 3.4
Amount of Conventional Pesticide Active Ingredient Used in the U.S.
by Pesticide Type and Market Sector, 2000 and 2001 Estimates**

Year	Herbicides / Plant Growth Regulators		Insecticides / Miticides		Fungicides		Nematicide / Fumigant		Other Conventional ¹		Total	
	Mil lbs of a.i.	%	Mil lbs of a.i.	%	Mil lbs of a.i.	%	Mil lbs of a.i.	%	Mil lbs of a.i.	%	Mil lbs of a.i.	%
2000												
Agriculture	432	80	90	74	44	59	131	84	25	78	722	78
Ind/Comm/Gov	48	9	17	14	19	26	24	15	6	19	114	12
Home & Garden	62	11	15	12	11	15	1	1	1	3	90	10
Total	542	100	122	100	74	100	156	100	32	100	926	100
2001												
Agriculture	433	78	73	70	42	58	102	80	25	83	675	76
Ind/Comm/Gov	49	9	15	14	19	26	24	19	4	13	111	13
Home & Garden	71	13	17	16	12	16	1	1	1	3	102	11
Total	553	100	105	100	73	100	127	100	30	100	888	100

Note: Totals may not add due to rounding. Table does not cover industrial wood preservatives, specialty biocides, chlorine/hypochlorites, and other chemicals used as pesticides (e.g., sulfur and petroleum oil). The abbreviation “a.i.” stands for active ingredient.

Source: EPA estimates based on Croplife America annual surveys, USDA/NASS (<http://www.usda.gov/nass/>), and EPA proprietary data.

See Tables 5.5 to 5.8 for 1982-2001 estimates.

1. “Other Conventional” pesticides include rodenticides, molluscicides, aquatic and fish/bird pesticides, and other miscellaneous conventional pesticides.

3.6 Most Commonly Used Conventional Pesticide Active Ingredients in the U.S. Agricultural Market Sector

Table 3.6 shows the 25 most commonly used conventional pesticide active ingredients in the agricultural sector in 2001 and selected earlier years. Glyphosate was the most used active ingredient in 2001 (between 85 million and 90 million pounds), displacing atrazine, which had been the most used active ingredient in agriculture for a number of years. Fifteen of the top 25 active ingredients used are herbicides; three are fungicides; two are insecticides; four are fumigants; and one is a plant growth regulator. The rankings rely on the estimated pounds of conventional pesticides used in the agricultural sector, taken from public and proprietary EPA databases.

Table 3.6
Most Commonly Used Conventional Pesticide Active Ingredients,
Agricultural Market Sector, 2001, 1999, 1997, and 1987 Estimates
(Ranked by Range in Millions of Pounds of Active Ingredient)

Active Ingredient	Type	2001		1999		1997		1987	
		Rank	Range	Rank	Range	Rank	Range	Rank	Range
Glyphosate	H	1	85-90	2	67-73	5	34-38	17	6-8
Atrazine	H	2	74-80	1	74-80	1	75-82	1	71-76
Metam Sodium	Fum	3	57-62	3	60-64	3	53-58	15	5-8
Acetochlor	H	4	30-35	4	30-35	7	31-36	NA	NA
2,4-D	H	5	28-33	6	28-33	8	29-33	5	29-33
Malathion	I	6	20-25	7	28-32	NA	NA	NA	NA
Methyl Bromide	Fum	7	20-25	5	28-33	4	38-45	NA	NA
Dichloropropene	Fum	8	20-25	11	17-20	6	32-37	4	30-35
Metolachlor-s	H	9	20-24	12	16-19	NA	NA	NA	NA
Metolachlor	H	10	15-22	8	26-30	2	63-69	3	45-50
Pendimethalin	H	11	15-19	10	17-22	9	24-28	10	10-13
Trifluralin	H	12	12-16	9	18-23	10	21-25	6	25-30
Chlorothalonil	F	13	8-11	13	9-11	15	7-10	19	5-7
Copper Hydroxide	F	14	8-10	15	8-10	13	10-13	19	5-7
Chlorpyrifos	I	15	8-10	16	8-10	14	9-13	14	6-9
Alachlor	H	16	6-9	17	7-10	12	13-16	2	55-60
Propanil	H	17	6-9	18	7-10	22	6-8	13	7-10
Chloropicrin	Fum	18	5-9	14	8-10	25	5-6	NA	NA
Dimethenamid	H	19	6-8	20	6-8	20	6-9	NA	NA
Mancozeb	F	20	6-8	21	6-8	17	7-10	21	4-6
Ethephon	PGR	21	5-8	24	5-6	NA	NA	NA	NA
EPTC	H	22	5-8	19	7-9	18	7-10	8	17-21
Simazine	H	23	5-7	NA	NA	NA	NA	NA	NA
Dicamba	H	24	5-7	22	6-8	16	7-10	23	4-6
Sulfosate	H	25	3-7	NA	NA	NA	NA	NA	NA

Note: List is limited to conventional pesticides and does not include sulfur and petroleum oil usage (see Table 3.11 for estimates).

H indicates herbicide; I, insecticide; Fum, fumigant; F, fungicide; and PGR, plant growth regulator. NA indicates that an estimate is not available.

Source: EPA estimates based on USDA/NASS (<http://www.usda.gov/nass>) and EPA proprietary data.

3.7 Most Commonly Used Conventional Pesticide Active Ingredients in the U.S. Non-Agricultural Market Sectors

Tables 3.7 and 3.8 show the ten most commonly used conventional pesticide active ingredients in the two non-agricultural sectors (home & garden and industry/commercial/government) in both 2001 and 1999. In both sectors, 2,4-D was the most used active ingredient, with between eight and eleven million pounds used in the home and garden sector (see Table 3.7), and between 16 and 18 million pounds used in the industry/commercial/government sector (see Table 3.8). Seven of the top ten in the home and garden sector are herbicides and three are insecticides. Six of the top ten in the industry/commercial/government sector are herbicides, two are fungicides, and two are insecticides. As noted in Table 3.8, due to the fact that some applicators apply pesticide in both markets, there may be some usage reported in one market that may have occurred in the other. The rankings rely on the estimated amount used of conventional pesticides in the non-agricultural sector taken from EPA proprietary databases.

**Table 3.7
Most Commonly Used Conventional Pesticide Active Ingredients, Home and Garden Market Sector, 2001 and 1999 Estimates (Ranked by Range in Millions of Pounds of Active Ingredient)**

Active Ingredient	Type	2001		1999	
		Rank	Range	Rank	Range
2,4-D	H	1	8-11	1	7-9
Glyphosate	H	2	5-8	2	5-8
Pendimethalin	H	3	3-6	NA	NA
Diazinon	I	4	4-6	5	2-4
MCPP	H	5	4-6	3	3-5
Carbaryl	I	6	2-4	7	2-4
Dicamba	H	7	2-4	4	3-5
Malathion	I	8	2-4	9	1-3
DCPA	H	9	1-3	10	1-3
Benfenin	H	10	1-3	8	1-3

Note: Does not include moth controls: Paradichlorobenzene (30 - 35 million pounds per year) and naphthalene (2 - 4 million pounds per year). Also does not include insect repellent N,N-diethyl-meta-toluamide (5 - 7 millions pounds per year).
H indicates herbicide and I, insecticide. NA indicates that an estimate is not available.
Source: EPA proprietary data.

**Table 3.8
Most Commonly Used Conventional Pesticide Active Ingredients, Industry/Commercial/Government Market Sector, 2001 and 1999 Estimates (Ranked by Range in Millions of Pounds of Active Ingredient)**

Active Ingredient	Type	2001		1999	
		Rank	Range	Rank	Range
2,4-D	H	1	16-18	1	17-20
Glyphosate	H	2	13-15	2	11-14
Copper Sulfate	F	3	4-6	3	5-7
Pendimethalin	H	4	3-5	4	3-5
Chlorothalanil	F	5	2-4	7	2-4
Chlorpyrifos	I	6	2-4	5	3-5
Diuron	H	7	2-4	8	2-4
MSMA	H	8	2-4	6	2-4
Triclopyr	H	9	1-3	10	1-3
Malathion	I	10	1-3	9	1-3

Note: Includes applications to homes and gardens by professional applicators. Does not include sulfur or petroleum oil. H indicates herbicide; I, insecticide; and F, fungicide.
Source: EPA proprietary data.

3.9 Pesticide Amount Used in the U.S.: Other

The total amount of other pesticides used in the U.S. was more than 300 million pounds in 2000 and 2001 (see Table 3.11). The pesticides in this group include sulfur and petroleum oil and other chemicals used as pesticides, such as sulfuric acid, insect repellants (e.g., DEET), moth control products (e.g., paradichlorobenzene), and others.¹ Nearly all of the sulfur and oil used (85%) is in the agricultural sector, while the use of the other pesticides in this group is mainly in the agricultural and home and garden sectors (93%). The increase in the amount used in 2001 resulted mainly from an increase in the use of sulfur and petroleum oil in the agricultural sector. The amount of sulfur and petroleum oil and of the other pesticides used in this group in the non-agricultural sectors did not change substantially between 2000 and 2001. Nearly three-fourths of the total amount of sulfur, oil, and other pesticides used was in the agricultural sector. The estimated use levels rely on the amount used and changes in the amount used of sulfur, oil, and other pesticides by sector and type derived from public and proprietary EPA databases.

Table 3.11
Other Pesticides Used in the U.S.
by Pesticide Type and Market Sector, 2000 and 2001 Estimates

Year	Sulfur & Oil		Other ¹		Total	
Sector	Mil lbs of a.i.	%	Mil lbs of a.i.	%	Mil lbs of a.i.	%
2000						
Agriculture	166	85	60	53	226	73
Ind/Comm/Gov	14	7	8	7	22	7
Home & Garden	15	8	45	40	60	19
Total	195	100	113	100	308	100
2001						
Agriculture	172	86	60	53	232	74
Ind/Comm/Gov	14	7	8	7	22	7
Home & Garden	15	7	46	40	61	19
Total	201	100	114	100	315	100

Note: Totals may not add due to rounding. Table estimates do not include industrial wood preservatives, specialty biocides, and chlorine/hypochlorites. The abbreviation "a.i." stands for active ingredient.

Source: EPA estimates based on Croplife America annual surveys, USDA/NASS (<http://www.usda.gov/nass>), and EPA proprietary data.

See Tables 5.5 to 5.8 for 1982-2001 estimates.

1. "Other" includes sulfuric acid, insect repellents, zinc sulfate, moth control chemicals (e.g., Paradichlorobenzene and naphthalene), and other miscellaneous chemicals produced largely for non-pesticidal purposes.

3.10 Pesticide Amount Used in the U.S.: Specialty Biocides and Chlorine/Hypochlorites

Tables 3.12 and 3.13 show the total amount of specialty biocides and chlorine/hypochlorites by end-use market in the U.S. in 2000 and 2001, respectively. Specialty biocides include water treatment chemicals, disinfectants and sanitizers, and products for other uses, such as in adhesives and sealants, leather, etc. More than two-thirds of the total amount of specialty biocides comprised water treatment chemicals. Chlorine/hypochlorites serve as water disinfectants, with 60% of their amount used in potable and waste water and 40% in recreational water. The estimates of the amount used rely on EPA proprietary databases and industry projections.

Table 3.12
Specialty Biocides Used in the U.S.
by End Use Market, 2000 and 2001 Estimates

Year	Total	
	Mil lbs	%
End Use		
2000		
Recreational and Industrial Water Treatment ¹	237	67
Disinfectants and Sanitizers ²	64	18
Other Specialty Biocides ³	52	15
Total	353	100
2001		
Recreational and Industrial Water Treatment ¹	244	67
Disinfectants and Sanitizers ²	65	18
Other Specialty Biocides ³	54	15
Total	363	100

Source: EPA estimates based on EPA proprietary data.

1. "Recreational and Industrial Water Treatment" does not include hypochlorite or chlorine consumption, which is reported separately in Table 3.13.
2. "Disinfectants and Sanitizers" includes industrial/institutional applications and household cleaning products. Specialty biocides only. Does not include hypochlorite or chlorine consumption, which is reported separately.
3. "Other Specialty Biocides" includes biocides for adhesives and sealants, leather, synthetic latex polymers, metalworking fluids, paints and coatings, petroleum products, plastics, and mineral slurries.

Table 3.13
Chlorine/Hypochlorites Used in the U.S.
by End Use Market, 2000 and 2001 Estimates

Year	Total	
	Mil lbs	%
End Use		
2000		
Disinfectant of Potable and Waste Water	1,520	60
Disinfectant for Recreational Water	1,012	40
Total	2,532	100
2001		
Disinfectant of Potable and Waste Water	1,566	60
Disinfectant for Recreational Water	1,043	40
Total	2,609	100

Note: The estimated amount has not changed from 1998/1999 due to a lack of available data.

Source: EPA estimates based on EPA proprietary data.

4. Producers and Users

4.1 Pesticide Producers and Users

Table 4.1 lists estimates of the number of firms that are pesticide producers, formulators, and distributors. Table 4.2 lists estimates of farm land, acres harvested, and the number of farms using pesticides and fertilizers. Table 4.3 lists estimates of the number of pest control firms and certified pesticide applicators. Table 4.4 lists estimates of the number of households using pesticides.

Table 4.1
Number of U.S. Pesticide Producers, Formulators, and Distributors

Major Pesticide Producers	18
Other Pesticide Producers	100
Major Pesticide Formulators	150 - 200
Other Pesticide Formulators	2,000
Major Distributors and Establishments	250 - 350
Other Distributors and Establishments	16,900

Source: EPA estimates based on EPA proprietary data.

Table 4.2
Land in Farms, Land Harvested, Number of Farms, and Farms Using Pesticides

Land in Farms (acres)	941M
Land Harvested (acres)	311M
Total Number of Farms	2.156M
Total Number of Farms with Cropland	1.661M
Total Number of Farms with Harvested Cropland	1.411M
Number of Farms Using Chemicals for:	
Insects on Crops/Hay	366,000
Nematodes	43,000
Diseases on Crops/Orchards	112,000
Weed/Grass/Brush	685,000
Defoliation/Fruit Thinning	51,000
Any or all of the above	941,000
Any or all of the above plus fertilizer	1,325,000

Source: 1997 USDA Census of Agriculture (<http://www.nass.usda.gov/Census>), 2003 USDA Agricultural Statistics (<http://www.usda.gov/nass/pubs/agstats/htm>). M = million

Table 4.3
Number of Commercial Pest Control Firms and Number of Certified Applicators

Commercial Pest Control Firms	33,100
Private ¹ Certified Applicators	693,181
Commercial ² Certified Applicators	421,730

Source: Estimates based on 1992 EPA National Home and Garden Pesticide Use Survey and 2001 EPA estimates of the number of certified private and commercial pesticide applicators.

1. Private certified applicators refers primarily to individual farmers.
2. Commercial certified applicators refers to professional pesticide applicators.

Table 4.4
Number of U.S. Households Using Pesticides

Pesticide Type	U.S. Households
Insecticides	59 Million
Fungicides	14 Million
Herbicides	41 Million
Repellents	53 Million
Disinfectants	59 Million
Any Pesticides	78 Million

Note: In 2000 the U.S. Census Bureau estimated the U.S. population to be 281.4 million with 105.5 million households. Source: EPA estimates based on 1992 EPA National Home and Garden Survey and 2000 U.S. Census Bureau population estimates (<http://quickfacts.census.gov/qfd/states/>).