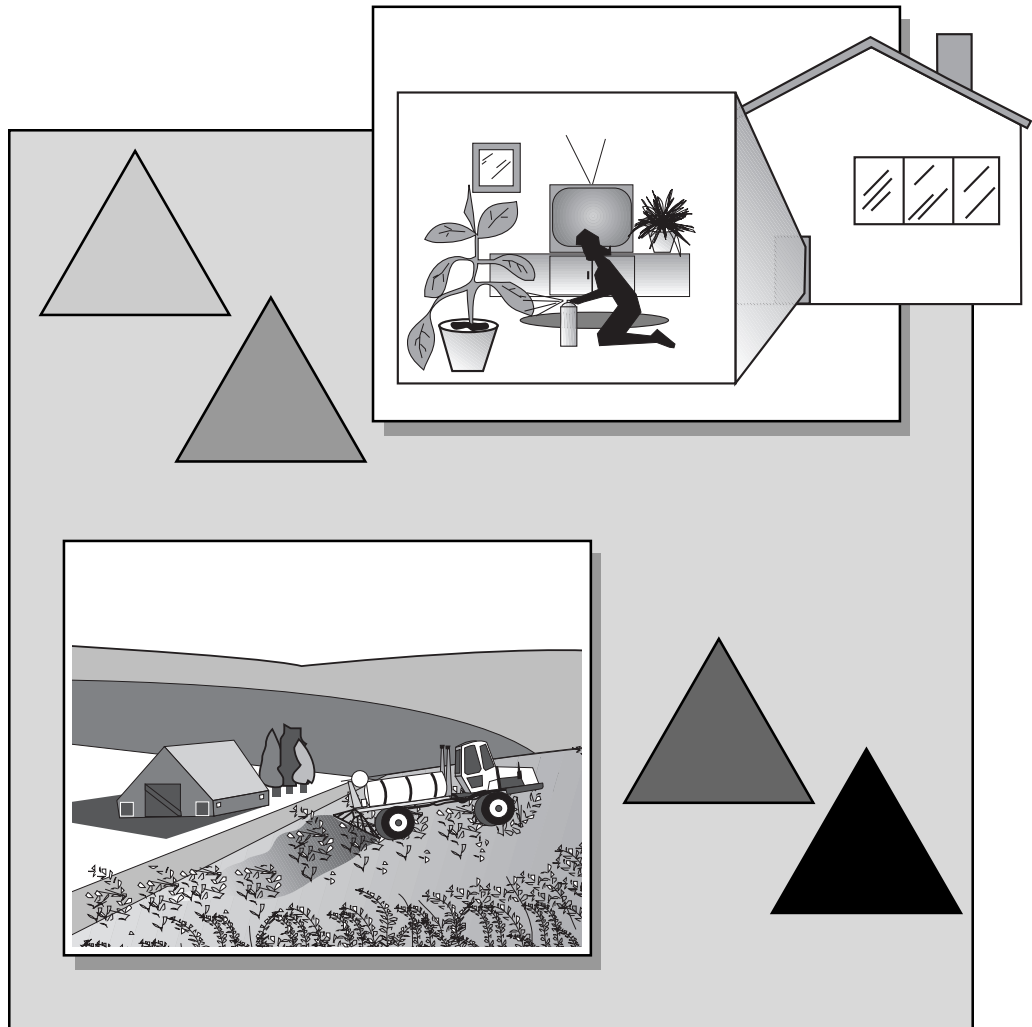




Pesticides Industry Sales And Usage

1994 and 1995 Market Estimates



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by

Arnold L. Aspelin, Ph. D.

**Biological and Economic Analysis Division
Office of Pesticide Programs
Office of Prevention, Pesticides and Toxic Substances
U.S. Environmental Protection Agency
Washington, DC 20460**

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Arnold L. Aspelin, Ph. D.*

Introduction

This report provides an overview of the pesticide industry for 1994 and 1995. It contains a series of tables with estimates of the U.S. market for those two years. The tables contain information on quantities used and user expenditures (by economic sector and pesticide class), imports, exports, numbers of firms/individuals involved in production/use of pesticides, number of pesticides, certified applicators and on a number of other topics.

Much of the tabular information in this report is for the years 1994 and 1995, but historical data are also presented. In a number of cases, the historical estimates of volume used and dollar expenditures have been updated (reestimated) as presented in tables 13 through 16 in this report. Care should be taken to use the new values in this report rather than earlier editions. The estimates of usage are presented for new, more specific categories (types) of usage than in earlier editions of this report. (See Table 3 column headings and discussion of the new categories in the section titled, "About This Report".) Graphic representations of the data are included along with a number of the tables.

* Arnold Aspelin is Senior Economic Advisor, Biological and Economic Analysis Division, Office of Pesticide Programs, EPA. If you have questions regarding this report or need further information, please contact the author at the following address: BEAD/OPP/EPA (7503W), 401 M Street, SW, Washington, DC 20460—telephone (703) 308-8136 or email: ASPELIN.ARNOLD@EPAMAIL.EPA.GOV.

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Overview

Pesticides of various types are used in most sectors of the U.S. Economy. In general terms, a pesticide is any agent used to kill or control undesired insects, weeds, rodents, fungi, bacteria or other organisms. Thus, the term “pesticide” includes insecticides, herbicides, rodenticides, fungicides, nematocides, and acaricides as well as disinfectants, fumigants, wood preservatives and plant growth regulators. Pesticides play a vital role in controlling agricultural, industrial, home/garden and public health pests. Many crops, commodities and services in the U.S. could not be supplied in an economic fashion without control of pests with chemicals or by other means. As a result, goods and services can be supplied at lower costs and/or with better quality. These economic benefits from pesticide usage are not achieved without potential risks to human health and the environment due to the toxicity and potency of pesticide chemicals. For this reason, the chemicals are regulated under the pesticide laws to avoid unacceptable risks.

Pesticide Types

In terms of the chemicals involved, a majority of the active ingredients registered as pesticides (about 875 currently) are “conventional” pesticides, i.e., ones developed and produced primarily for use as pesticides. However, there are also other chemicals produced mostly for other purposes some of which are used as pesticides. Notable examples are chlorine, sulfur, and petroleum which are used as pesticides. Also, there are industrial wood preservatives and biocides, which are not generally included in the term conventional pesticides. All of these types of pesticides are regulated under the Pesticide Laws (principally the Federal Insecticide, Fungicide and Rodenticide Act—FIFRA) administered by EPA in cooperation with other Federal Agencies (such as FDA and USDA) and the States.

Overall Quantities of Pesticides Used

About 4.5 billion pounds of chemicals are used as pesticides in the U.S. in a typical year (measured on basis active ingredient). For 1995, the quantities used are estimated, by type of pesticide, as follows:

Type	Bil. of lbs.	Percent
Conventional pesticides	.97	21
Other pesticide chemicals (sulfur, petroleum, etc.)	.25	6
<i>Subtotal</i>	<i>1.22</i>	<i>27</i>
Wood preservatives	.72	16
Specialty biocides	.26	6
Chlorine/hypochlorites	2.32	51
Total	4.52	100

Conventional pesticides and “other pesticide chemicals” (e.g., sulfur, petroleum, etc.) account for about one-fourth of the total pesticide active ingredient used in the U.S. (1.22 billion pounds or 27 percent of the total). A majority of these pesticides is used in agriculture to produce food and fiber (77 percent or 939 million pounds of active ingredient in 1995), with the remainder used in industry/government applications and by homeowners. With usage of 1.22 billion pounds for conventional

pesticides plus other pesticide chemicals, the U.S. accounts for about one-fifth of such usage world wide. Chlorine/hypochlorites are the leading type of pesticides in the U.S., with half of the U.S. total. Wood preservatives and specialty biocides make up the remainder of the U.S. total of 4.52 billion pounds in 1995. The above quantities equal 4.6 pounds per capita in the U.S. for conventional pesticides plus sulfur, etc., and 17.0 pounds per capita for the total of all types.

Expenditures for Pesticides

The pesticide industry is quite significant in dollar terms. Annual expenditures by users of pesticides totalled \$11.3 billion in 1995 (conventional pesticides plus sulfur, etc.). Of this, 70 percent was for use in agriculture (a total of \$7.9 billion — an average of nearly \$4,200 per farm in the U.S. — for 1.9 million farms). The U.S. total of \$11.3 billion equals \$43 per capita in the U.S. The average U.S. household had expenditures of about \$20 for pesticides applied by the homeowner. (This does not include expenditures for pesticides applied to homes and gardens by others for hire.) The U.S. accounts for nearly one-third of pesticide user expenditures world wide.

Numbers of Pesticide Producers and Users

The U.S. pesticide sector involves the following numbers of firms and individuals (approximate numbers); major pesticide manufacturers (18); other manufacturers (100); manufacturing workers (6-10,000); producing establishments (7,300); formulators (2,200); distributors/establishments (17,000); farms using pesticides (1.4 mil. out of 1.9 mil. total); commercial pest control firms (35-40,000); certified commercial applicators (384,000); households using pesticides (70 mil. out of 95 mil. total).

Trends in Conventional Pesticide Usage

Agriculture: Usage of conventional pesticides on farms increased from about 400 mil. lbs. in the mid-1960s to a peak of nearly 850 mil. lbs. around 1980, primarily due to the widespread adoption of herbicides in crop production. Since that time, usage has been somewhat lower and has varied from a low of 658 mil. lbs. in 1987 to a high of 786 mil. lbs. in 1994 (active ingredient basis). Pesticide usage in agriculture can vary considerably from year to year depending on weather, pest outbreaks, crop acreage and economic factors such as crop prices.

Usage of conventional pesticides in agriculture increased noticeably in 1994 (by about 11 percent over 1993) due to more acreages grown for important pesticide-using crops (principally corn and soybeans) and due to impacts of floods/unseasonable weather during the 1993/94 period in midwest and western states. The total U.S. acreage of corn and soybeans grown increased about 7 mil. in 1994 over 1993. Acreages of cotton, rice and sunflowers also increased in 1994. The flooding in 1993 accelerated weed infestation problems in 1994, resulting in more herbicide usage. The need for herbicides in 1994 was intensified due to wet soil conditions and reduced usage of post-harvest herbicide applications in 1993. Also flooding conditions had the effect of moving weed seeds into new areas. Within midwest states, the areas most affected by flooding had reduced herbicide usage in 1993 compared to other areas. Then, in 1994, herbicide usage in the most affected areas increased much more than in the less flooded areas. Herbicides accounted for most of the increase in agricultural pesticide usage in 1994 over 1993 (60 mil. out of 80 mil. pound increase in conventional usage).

Other Sectors: In the non-agricultural sectors, conventional pesticide usage reached a peak of more than 300 mil. lbs. in the 1970s and has declined rather consistently since 1980—to a level of about 200 mil. lbs. in 1995. Most of this decline is due to less usage in the industrial/commercial/governmental sector (referred to as the professional market) which totalled 128 mil. lbs. in 1995. Usage of conventional pesticides by homeowners is estimated at 74 mil. lbs. for 1995.

Highlights of Report

- U.S. pesticide user purchases account for nearly one-third of the world market in dollar terms and about one-fifth of the active ingredient (*Table 1*).
- Annual U.S. pesticide user expenditures totalled approximately \$11.3 billion in 1995 (*Table 2*). (\$10.6 billion in 1994)
- Agriculture accounts for more than two-thirds of pesticide user expenditures and three-fourths of the quantity used annually (*Tables 2 & 3*).
- Herbicides are the leading type of pesticides, in terms of both user expenditures and volumes used (*Tables 2 & 3*).
- About 1.0 billion pounds of active ingredient of conventional pesticides are used annually in the U.S. (*Table 4*).
- Total U.S. pesticide usage in 1995 was about 4.5 billion pounds of active ingredient. This figure includes conventional pesticides (1.0 billion lbs.) plus industrial wood preservatives, biocides, and certain other chemicals used as pesticides (*Table 4*). This usage involves about 21,000 pesticide products and 875 active ingredients registered under the Federal Pesticide Law (*Table 7*).
- Farmers' expenditures on pesticides were equal to 4.6% of total farm production expenditures in 1995, up from 3.9% in 1993 (*Table 5*).
- Net usage of conventional pesticides of about 1.0 billion pounds derives from U.S. production of 1.3 billion, imports of 0.2 billion, and exports of 0.5 billion (pounds of active ingredient of conventional pesticides) (*Table 6*).
- The use of pesticides occurs on about three-fourths of the Nation's farms (1.4 million out of 1.9 million) and households (70 million out of 95 million) (*Table 7*).
- The most widely used pesticide in U.S. agricultural crop production by volume is the herbicide atrazine (*Table 8*). The herbicide 2, 4-D has the largest volume of usage in the non-agricultural sectors (*Table 9*).
- In 1994, conventional pesticide usage in agriculture increased to 786 million pounds from 706 in 1993, or by about 11 percent, and declined about 2 percent in 1995 (*Table 10*). The significant increase in agricultural pesticide usage in 1994 was due to (1) acreage increases for several pesticide intensive crops and (2) exceptional pest control problems associated with major flooding and unseasonable weather in midwest and western states. For the non-agricultural sectors, conventional pesticide usage declined in both 1994 and 1995 (*Table 10*).
- There were 31 new active ingredients registered as pesticides under FIFRA in 1995 (30 in 1994) (*Table 11*). Of these new active ingredients, more than one-half were "safer" pesticides (biological or other reduced risk) (*Table 11b*).
- There are about 1.34 million certified pesticide applicators in the U.S. (*Table 12*). Of these, most are for agricultural applications (about 960,000) and the remainder (384,000) are certified commercial applicators (*Table 12*).

Agency Survey Responsibilities

In recent years, through a series of coordinated initiatives, EPA and USDA have been improving information available on pesticide usage. Each Agency has accomplished this through expanded surveying activities, with EPA focusing on non-agricultural usage sites and USDA focusing on agricultural usage sites. Surveys of pesticide usage by homeowners and by commercial applicators have been conducted by EPA since 1990. For further information about EPA pesticide survey and data activities, contact Alan R. Goozner, Statistician, BEAD/OPP/EPA (7503W), 401 M Street, SW, Washington, DC 20460—telephone (703) 308-8147 or e-mail at Goozner.Alan@EPAMail.EPA.gov

Since 1990, USDA (NASS and ERS) has been collecting more extensive and frequent data on agricultural pesticide usage. USDA's data collection and reporting activities on agricultural pesticide usage include annual surveys of usage on field crops and alternate-year surveys for selected vegetables, fruits, and nuts. The pesticide usage surveys cover the most significant field crops, vegetables, fruits, and nuts. For each crop, major producing states are surveyed, usually accounting for 70% to 90% of the acreage grown. Results are reported for individual states and in aggregate for "major states". For more information about USDA pesticide usage surveys, contact Sam Rives, USDA/NASS, 14th & Independence Ave. S.W., Room 4162 S. Agriculture Building, Washington, DC 20250—telephone (202) 720-2248.

About this Report

EPA, along with the States and other agencies such as USDA, is responsible for regulation of the production and use of pesticides in the U.S., under the Federal Insecticide, Fungicide and Rodenticide Act of 1947 (FIFRA). This report is designed to provide contemporary and historical economic profile information on the U.S. pesticide producing and using sectors covered by state/federal regulatory programs mandated under FIFRA. Economic profile information is provided on a variety of topics, particularly the pesticide market in terms of dollar values and quantities of active ingredient. Reports have been prepared on this topic by the EPA Pesticide Program covering the years since 1979.

In this report, quantities and dollar values for pesticide usage are reported with separate breakouts for agriculture, home/garden (homeowner applications) and industrial/commercial/governmental (professional market). They are also reported by commonly used pesticide class categories, e.g., herbicides/plant growth regulators and insecticides/miticides. The definitions for economic sectors and pesticide classes are presented in notes below Tables 2 and 3. The definitions of pesticide categories (types) used in this report are different than those used in reports for earlier years. This report breaks out pesticide usage into a 10 column format instead of the previous five columns. The historical tables for earlier years have been revised to use the new 10 column format (e.g. tables 13 and 14).

There are no programs at EPA or other agencies devoted specifically to estimation of the overall pesticide market in quantitative and dollar terms each year. Accordingly, the report is prepared based on the best information from the public domain and proprietary sources where they are available for use in estimation. The numbers presented in the report should be considered approximate values rather than precise values with known statistical properties, but are thought to quite accurately show trends over time.

The Agency has available a wide variety of published and proprietary information upon which to base estimates. Extensive files and library materials are maintained at EPA/OPP on pesticide usage. For the agricultural sector, which accounts for a majority of use of conventional pesticides, the Agency has available six national data bases/services including those in the U.S. Department of Agriculture plus a number of more specific and limited data sources. For the non-agricultural sector, there is a similar number of sources of information upon which to make national estimates. For both the agricultural and non-agricultural estimates, some use is made of proprietary data sources, with the permission of vendors, for purposes of arriving at annual estimates of quantities sold and sales values. The proprietary sources used by EPA are well known organizations, which are also utilized by registrants and other private sector firms.

The methods used by the various sources of information to make estimates vary from large statistically based panels (e.g., more than 15,000 respondents annually) to use of largely unstructured interview/survey approaches. Each one must be considered on its merits in judging the usefulness and relevance to making the needed annual market estimates. Corroboration and cross checking are used where possible. One of the problems with some of the existing databases is lack of consistency in coverage, scope, and sampling from year to year, making some sources less useful for computing changes from year to year.

**Pesticide Market Estimate
Tables and Charts,
1995 and Earlier Years**

Table 1.**U.S. and World Pesticide Sales at User Level, 1995 Estimates.**

Pesticide Class ¹	U.S. Market		World Market		U.S. % of World Market
	(Million)	(%)	(Million)	(%)	
User Expenditures (Millions of \$)					
Herbicides	\$6,276	55%	\$16,237	43%	39%
Insecticides	3,552	32%	12,465	33%	29%
Fungicides	798	7%	6,355	17%	13%
Other	690	6%	2,639	7%	26%
Total	\$11,316	100%	\$37,696	100%	30%
Volume of Active Ingredient (Millions of lbs.)					
Herbicides	556	46%	2,210	39%	30%
Insecticides	137	11%	1,500	26%	9%
Fungicides	77	6%	550	10%	14%
Other	452	37%	1,450	25%	31%
Total	1,222	100%	5,710	100%	21%

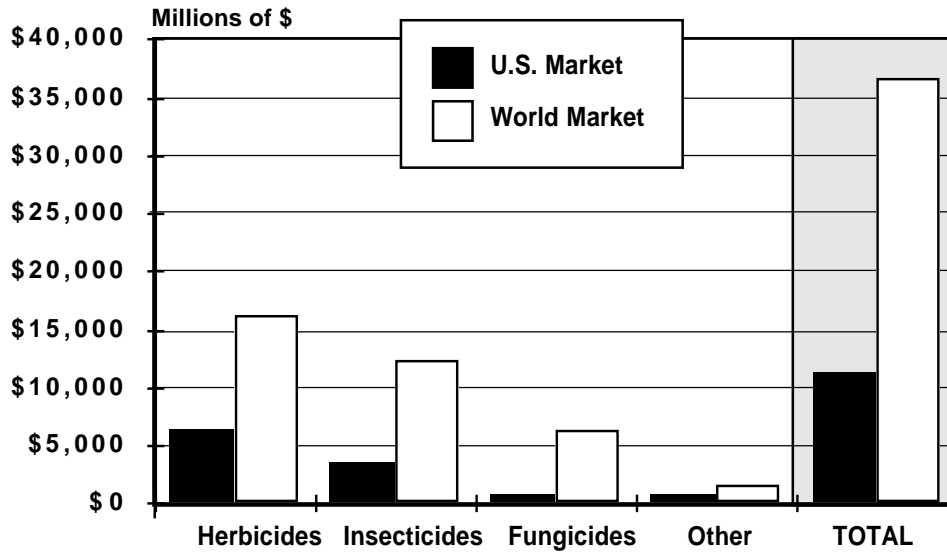
NOTE: Totals may not add due to rounding.

SOURCE: EPA estimates based on SRI Staff input, American Crop Protection Association (ACPA) annual surveys, USDA reports, other published reports, and proprietary data.

FOOTNOTES:

1 Does not include industrial wood preservatives, specialty biocides and chlorine/hypochlorites. See definitions of pesticide classes below tables 2 and 3.

U.S. vs. World Pesticide Sales User Expenditures, 1995



U.S. vs. World Pesticide Sales Volume of Active Ingredient, 1995

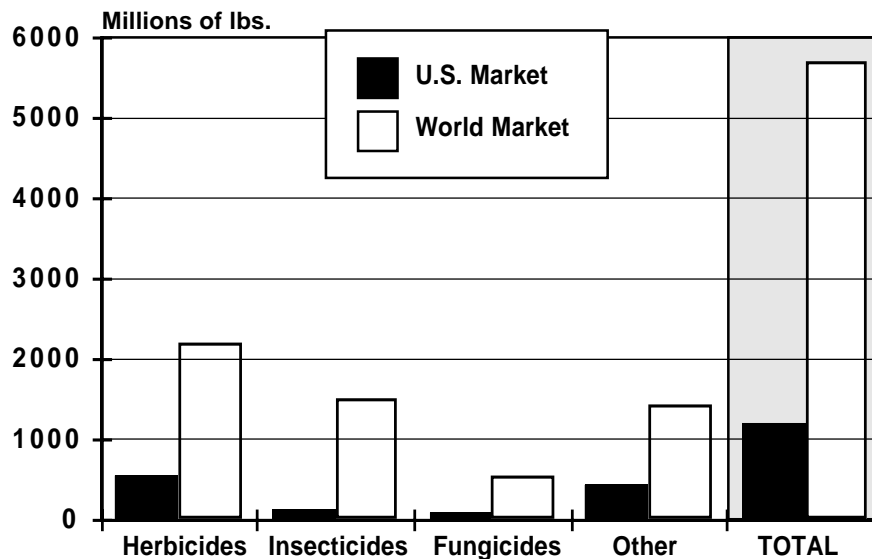


Table 2.**User Expenditures for Pesticides in the U.S. by Class and Sector,
1994 and 1995 Estimates.**

Sector ²	Herbicides/ Plant Growth Regs.		Insecticides/ Miticides		Fungicides		Other ¹		TOTAL	
	(\$M)	(%)	(\$M)	(%)	(\$M)	(%)	(\$M)	(%)	(\$M)	(%)
1994										
Agriculture	\$4,808	81%	\$1,453	45%	\$585	79%	\$451	68%	\$7,297	69%
Ind./Comm./Govt.	679	11%	528	16%	132	18%	65	10%	1,404	13%
Home & Garden	456	8%	1,261	39%	24	3%	151	23%	1,893	18%
Total	\$5,944	100%	\$3,244	100%	\$741	100%	\$667	100%	\$10,594	100%
1995										
Agriculture	\$5,112	81%	\$1,710	48%	\$638	80%	\$469	68%	\$7,929	70%
Ind./Comm./Govt.	700	11%	543	15%	136	17%	66	10%	1,445	13%
Home & Garden	465	7%	1,299	37%	24	3%	155	22%	1,943	17%
Total	\$6,276	100%	\$3,552	100%	\$798	100%	\$690	100%	\$11,317	100%

NOTES: Totals may not add due to rounding.

Does not include industrial wood preservatives, specialty biocides, and chlorine/hypochlorites.

SOURCE: EPA estimates based on ACPA annual surveys, USDA reports, other published reports, and proprietary data.

FOOTNOTES:

1 Includes nematicides, fumigants, rodenticides, molluscicides, aquatic, fish/bird pesticides, other miscellaneous conventional pesticides plus other chemicals used as pesticides. (See Table 3 for more detail.)

2 Sector Definitions:

Quantities and expenditures for pesticides in the U.S. are divided among economic sectors as follows:

Agriculture--applications by owner/operators and custom/commercial applicators to farms and facilities involved in production of raw agricultural commodities, principally food, fiber and tobacco; includes non-crop/post harvest usage as well as crop/field applications;

Ind./Comm./Govt.--applications by owner/operators and custom/commercial applicators to industry, commercial and governmental facilities, buildings, sites and land;

plus: custom/commercial applications to homes and gardens, including lawns;

Home & Garden--homeowner applications to homes and gardens, including lawns; single and multiple unit housing.

U.S. User Expenditures for Conventional Pesticides, 1995 Estimates

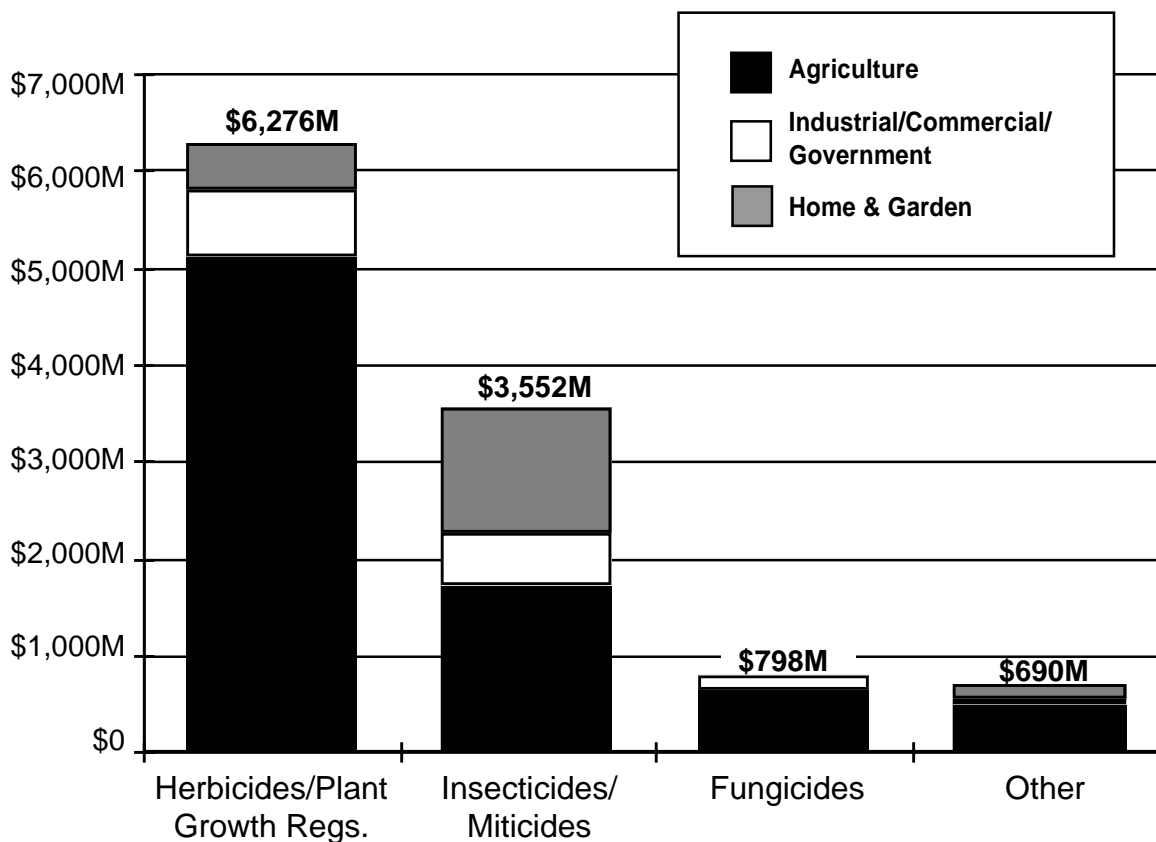


Table 3.

**Volume of Pesticide Active Ingredient Used in the U.S.
by Type, Class, and Sector, 1994 and 1995 Estimates.**

Sector ³	Conventional Pesticides										Other Pesticides				Total					
	Herbicides/ Plant Growth Regs		Insecticides/ Miticides		Fungicides		Fumigants/ Nematicides		Other ¹		Total	Sulfur/ Oil		Other ²		Total	Total			
	(Mlb.)	(%)	(Mlb.)	(%)	(Mlb.)	(%)	(Mlb.)	(%)	(Mlb.)	(%)	(Mlb.)	(Mlb.)	(%)	(Mlb.)	(%)	(Mlb.)	(Mlb.)	(%)		
1994																				
Agriculture	485	83%	90	65%	48	61%	138	83%	25	76%	786	79%	134	83%	29	35%	163	67%	949	76%
Ind./Comm./Govt.	52	9%	30	22%	23	29%	27	16%	7	21%	139	14%	12	7%	8	10%	20	8%	159	13%
Home & Garden	46	8%	18	13%	8	10%	1	1%	1	3%	74	7%	15	9%	46	55%	61	25%	135	11%
Total	583	100%	138	100%	79	100%	166	100%	33	100%	999	100%	161	100%	83	100%	244	100%	1,243	100%
1995																				
Agriculture	461	83%	91	66%	49	64%	145	85%	25	78%	771	79%	138	83%	30	37%	168	67%	939	77%
Ind./Comm./Govt.	48	9%	29	21%	20	26%	25	15%	6	19%	128	13%	14	8%	8	10%	22	9%	150	12%
Home & Garden	47	8%	17	12%	8	10%	1	1%	1	3%	74	8%	15	9%	44	54%	59	24%	133	11%
Total	556	100%	137	100%	77	100%	171	100%	32	100%	973	100%	167	100%	82	100%	249	100%	1,222	100%

NOTES: Totals may not add due to rounding.

Does not include industrial wood preservatives, specialty biocides, and chlorine/hypochlorites.

SOURCE: EPA estimates based on ACPA annual surveys, USDA reports, other published reports, and proprietary data.

FOOTNOTES:

1 Includes rodenticides, molluscicides, aquatic, fish/bird pesticides, insect regulators, and other misc. pesticides.

2 Includes sulfuric acid, insect repellents, zinc sulfate and other misc. chemicals produced largely for non-pesticidal purposes. Moth control chemicals (e.g., paradichlorobenzene and negehtaline are not included in totals presented).

3 Sector Definitions:

Quantities and expenditures for pesticides in the U.S. are divided among economic sectors as follows:

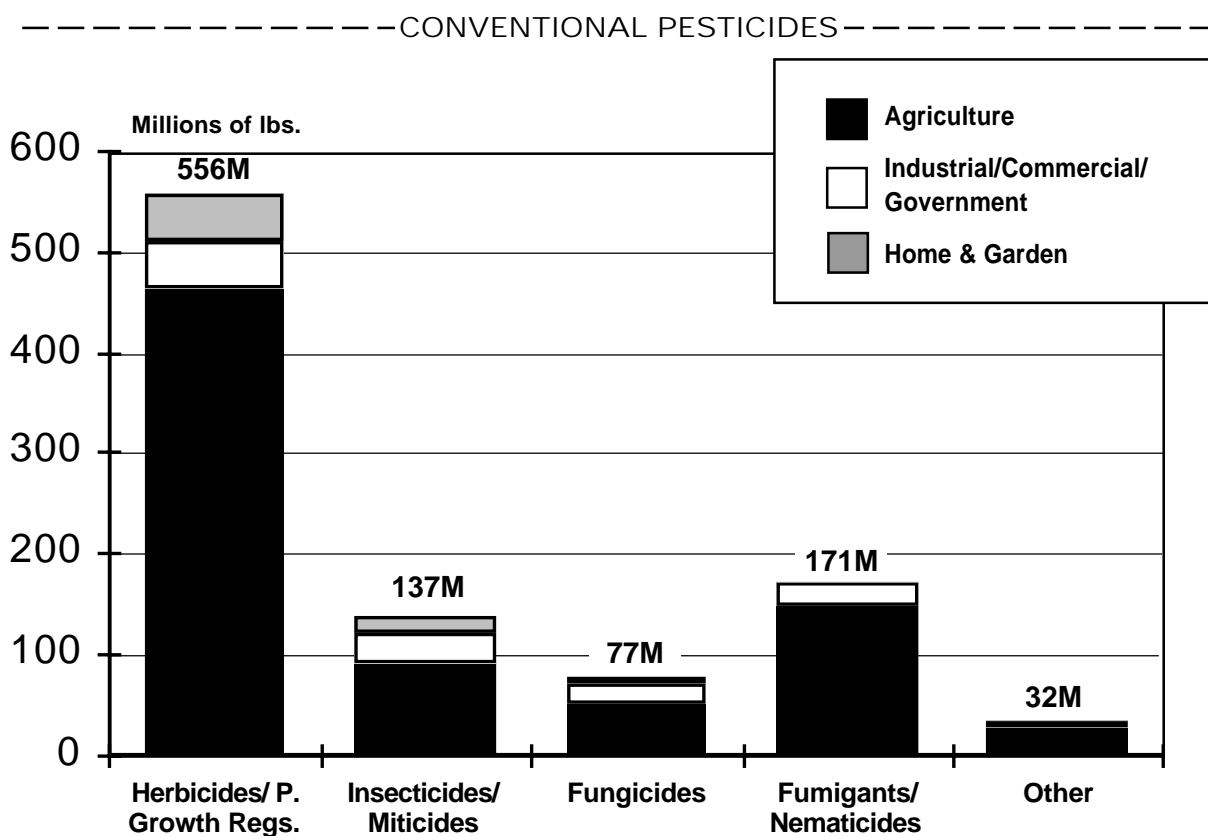
Agriculture--applications by owner/operators and custom/commercial applicators to farms and facilities involved in production of raw agricultural commodities, principally food, fiber and tobacco; includes non-crop/post harvest usage as well as crop/field applications;

Ind./Comm./Govt.--applications by owner/operators and custom/commercial applicators to industry, commercial and governmental facilities, buildings, sites and land;

plus: custom/commercial applications to homes and gardens, including lawns;

Home & Garden--homeowner applications to homes and gardens, including lawns; single and multiple unit housing.

U.S. Volume for Pesticide Usage, 1995 Estimates



----- CONVENTIONAL AND OTHER PESTICIDE CHEMICALS -----

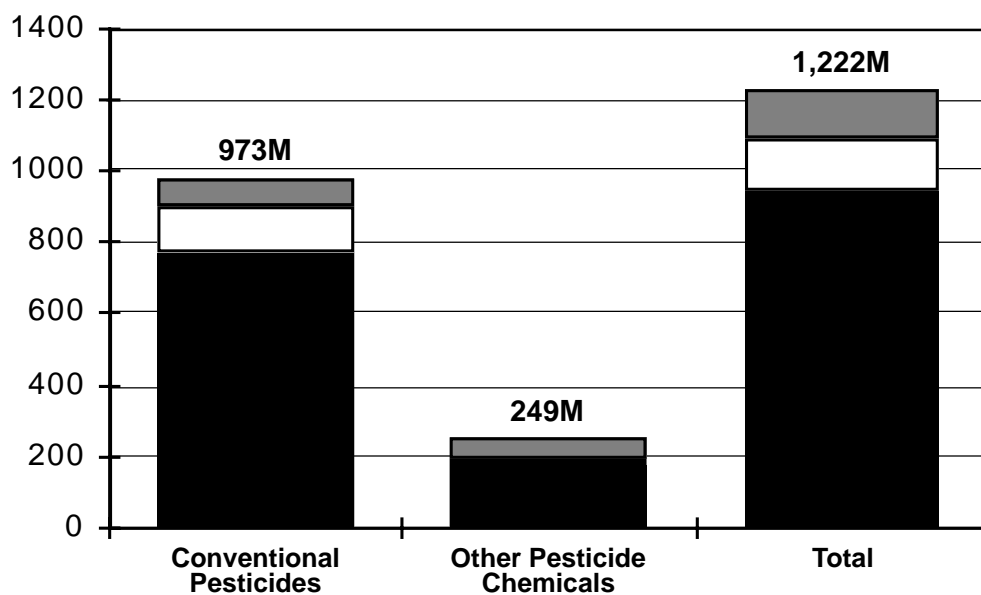


Table 4.**U.S. Usage of Conventional and Other Types of Pesticides ,
1994–1995 Estimates.**

Type	Million Pounds a.i.	
	1994	1995
Conventional Pesticides	999	973
Sulfur, petroleum (oil, distillates, etc.), sulfuric acid, and other misc. chemicals used as pesticides	244	249
Wood Preservatives ¹	703	725
Specialty Biocides by End Use		
— Swim pools, spas, ind. water treatment ²	170	175
— Disinfectants and sanitizers ³	31	32
— Other ⁴	47	50
Subtotal	248	257
Chlorine/ hypochlorites		
— Disinfection of potable and waste water	1,350	1,390
— Bleaching disinfectant and pools	900	925
Subtotal	2,250	2,315
Total	4,444	4,519

SOURCES: Wood Preservatives— AWPI report for 1994. EPA estimate for 1995.

Biocides — Kline & Co. staff input.

Chlorine/Hypo. — Report for Chlorine Institute by Charles River Assoc's., April 1993.

FOOTNOTES:

- 1 Includes water and oil borne preservatives, fire retardants and creosote/coal tar/petroleum preservatives.
- 2 Specialty biocides only. Does not include hypochlorite or chlorine consumption, which is reported separately.
- 3 Includes industrial/institutional applications and household cleaning products. Specialty biocides only. Does not include hypochlorite or chlorine consumption, which is reported separately.
- 4 Includes biocides for adhesives and sealants, leather, synthetic latex polymers, metalworking fluids, paints and coatings, petroleum products, plastics, and textiles. Does not include: hospital and medical antiseptics, food and feed preservatives, and cosmetics/toiletries.

These latter types of usage are not included, as they are regulated largely by FDA under US FD&CA, rather than FIFRA. FDA and EPA share regulatory responsibilities over some of the speciality biocide usage reported in the table.

Table 5.**Importance of Pesticide Expenditures to U.S. Farmers,
1993–1995 Estimates.**

	1993		1994		1995	
	\$Billion	%	\$Billion	%	\$Billion	%
Farm Pesticides Expenditures ¹	6.13	3.9%	7.3	4.4%	7.9	4.6%
Total Farm Production Expenses ²	156.5	100%	162.8	100%	170.8	100%

FOOTNOTES:

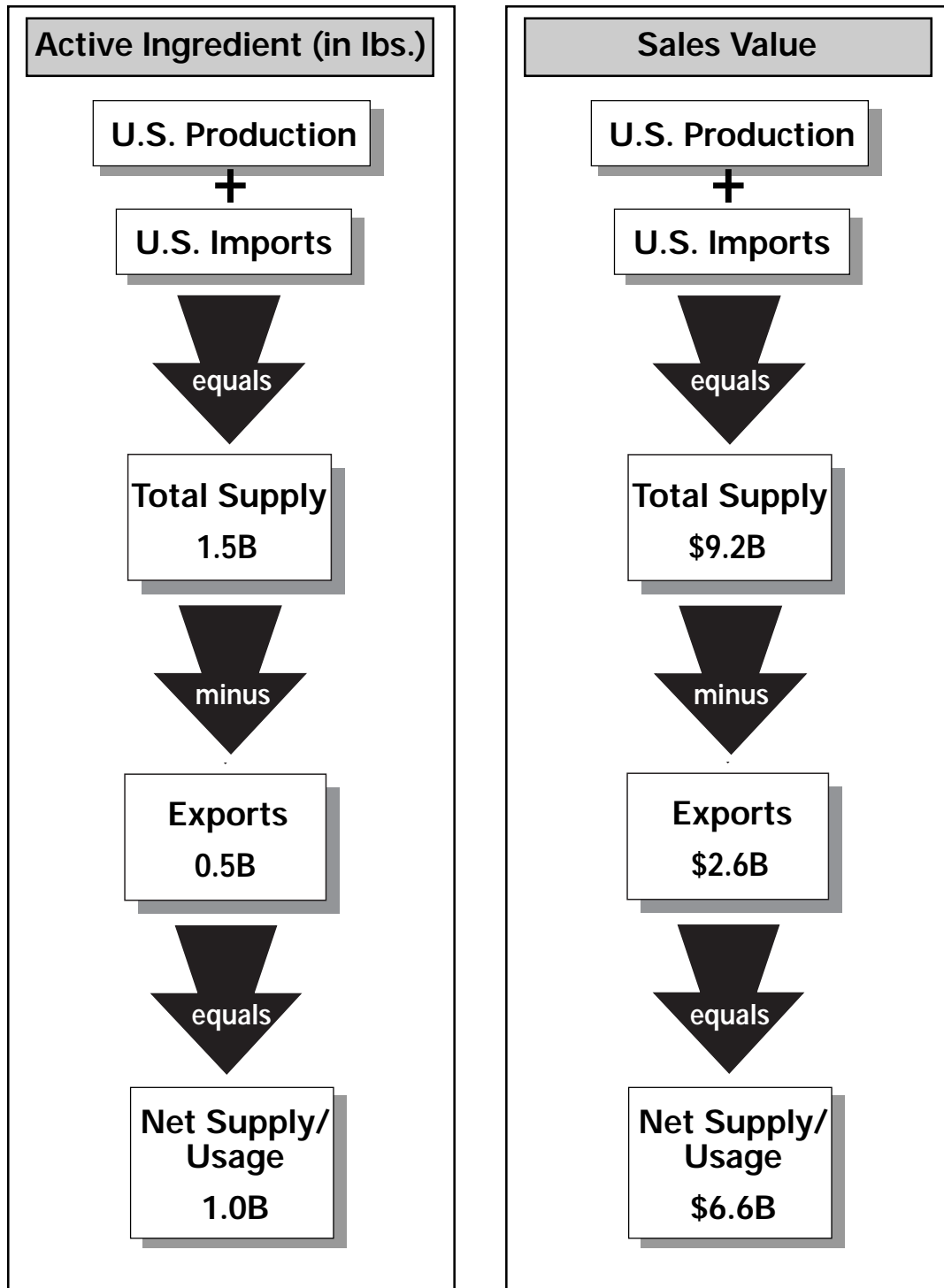
- 1 EPA Estimates (Tables 2 and 16).
- 2 USDA/ERS, 1997.

Table 6.**U.S. Production, Imports, Exports, and Net Supply of Conventional Pesticides
at Producer Level, 1994/95 Estimates.**

Category	Active Ingredient (in billions of lbs.)	Sales Value (in billions of dollars)
	1994/95	1994/95
U.S. Production	1.3	7.0
U.S. Imports	0.2	2.2
<hr/> Total Supply	1.5	9.2
<hr/> U.S. Exports	0.5	2.6
<hr/> Net Supply/Usage	1.0	6.6

SOURCE: EPA estimates based on ACPA Surveys, Department of Commerce Publications, tabulations and other sources.

**U.S. Production, Imports, Exports and Net Supply of
Conventional Pesticides, 1994/95 Estimates**



NOTE: B = billion

Table 8.

**Quantities of Most Commonly Used Conventional Pesticides
in U.S. Agricultural Crop Production**

(Approximate Quantities in 1995 and with Earlier Years)

	1995 Mil. lbs. AI	Earlier Years			
		1993		1987	
		Rank	Mil. lbs. AI	Rank	Mil. lbs. AI
1. Atrazine	68 - 73	1	70 - 75	1	71-76
2. Metolachlor	59 - 64	2	60 - 65	3	45-50
3. Metam Sodium	49 - 54	8	25 - 30	15	5-8
4. Methyl Bromide	39 - 46	3	49 - 57	—	NA
5. Dichloropropene	38 - 43	6	30 - 35	4	30-35
6. 2,4-D	31 - 36	7	25 - 30	5	29-33
7. Glyphosate	25 - 30	11	15 - 20	17	6-8
8. Cyanazine	24 - 29	5	30 - 35	7	21-25
9. Pendimethalin	23 - 28	10	20 - 25	10	10-13
10. Trifluralin	23 - 28	9	20 - 25	6	25-30
11. Acetochlor	22 - 27	—	0	—	0
12. Alachlor	19 - 24	4	45 - 50	2	55-60
13. EPTC	9 - 13	12	10 - 15	8	17-21
14. Chlorpyrifos	9 - 13	13	10 - 15	14	6-9
15. Chlorothalonil	8 - 12	14	10 - 15	19	5-7
16. Copper Hydroxide	7 - 11	20	4 - 7	40	1-2
17. Propanil	6 - 10	15	7 - 12	13	7-10
18. Dicamba	6 - 10	16	6 - 10	23	4-6
19. Terbufos	6 - 9	17	5 - 8	11	8-10
20. Mancozeb	6 - 9	19	4 - 7	21	4-6
21. Fluometuron	5 - 9	—	NA	—	NA
22. MSMA	4 - 8	—	NA	—	NA
23. Bentazone	4 - 8	18	4 - 7	15	6-9
24. Parathion	4 - 7	21	4 - 7	12	8-10
25. Sodium Chlorate	4 - 6	—	NA	20	5-7

SOURCE: EPA estimates based on proprietary data.

NOTE: List is limited to conventional pesticides. Does not include sulfur usage (79-89 mil. lbs. in 1995) and petroleum oil/distillates usage (50-57 mil. lbs. in 1995).

Table 9.

Quantities of Pesticides Most Commonly Used in Non-Agricultural Sectors of U.S.
(Approximate Quantities, 1994/95)

Home and Garden Market
 (Homeowners applications)

Pesticide	Mil. lbs.
1. 2,4-D	7 - 9
2. Glyphosate	5 - 7
3. Dicamba	3 - 5
4. MCPP	3 - 5
5. Diazinon	2 - 4
6. Chlorpyrifos	2 - 4
7. Carbaryl	1 - 3
8. Benefin	1 - 3
9. Dacthal	1 - 3

NOTE: Does not include moth control: Paradichlorbenene (30-35 mil. lbs./yr.) and naphthaline (2-4 mil. lbs./yr.). Also does not include insect repellent: N,N-diethyl-meta-toluamide (5-7 mil. lbs./yr.)

Industrial/Commercial/Gov't
 (Owner and Hired Professional)

Pesticide	Mil. lbs.
1. 2,4-D	10 - 13
2. Chlorpyrifos	9 - 13
3. Glyphosate	8 - 11
4. Methyl Bromide	6 - 8
5. Copper Sulfate	5 - 7
6. MSMA	3 - 4
7. Diazinon	3 - 4
8. Diuron	2 - 4
9. Malathion	2 - 3

NOTE: Does not include usage of sulfur and petroleum/oils.

SOURCE: EPA estimates based on a variety of sources.

Table 10.**United States Conventional Pesticide Usage, Total and Estimated Agricultural Sector Share, 1964-1995.**

Year	Total U.S.		Agricultural Sector			Non-Ag. Sectors	
	Million lbs. a.i.	% Change	Million lbs. a.i.	% of Total U.S.	% Change	Million lbs. a.i.	% Change
1964	647	—	366	57%	—	281	
1965	683	5.6%	396	58%	8.2%	287	2.1%
1966	705	3.2%	414	59%	4.5%	291	1.4%
1967	728	3.3%	429	59%	3.6%	299	2.7%
1968	757	4.0%	457	60%	6.5%	300	0.3%
1969	792	4.6%	491	62%	7.4%	301	0.3%
1970	798	0.8%	499	63%	1.6%	299	-0.7%
1971	865	8.4%	528	61%	5.8%	337	12.7%
1972	885	2.3%	575	65%	8.9%	310	-8.0%
1973	926	4.6%	607	66%	5.6%	319	2.9%
1974	1009	9.0%	688	68%	13.3%	321	0.6%
1975	1054	4.5%	729	69%	6.0%	325	1.2%
1976	1069	1.4%	753	70%	3.3%	316	-2.8%
1977	1109	3.7%	794	72%	5.4%	315	-0.3%
1978	1127	1.6%	813	72%	2.4%	314	-0.3%
1979	1144	1.5%	843	74%	3.7%	301	-4.1%
1980	1121	-2.0%	826	74%	-2.0%	295	-2.0%
1981	1123	0.2%	831	74%	0.6%	292	-1.0%
1982	1096	-2.4%	805	73%	-3.1%	291	-0.3%
1983	1040	-5.1%	749	72%	-7.0%	291	0.0%
1984	1085	4.3%	801	74%	6.9%	284	-2.4%
1985	1052	-3.0%	780	74%	-2.6%	272	-4.2%
1986	1025	-2.6%	755	74%	-3.2%	270	-0.7%
1987	917	-10.5%	658	72%	-12.8%	259	-4.1%
1988	954	4.0%	699	73%	6.2%	255	-1.5%
1989	973	2.0%	722	74%	3.3%	251	-1.6%
1990	976	0.3%	728	75%	0.8%	248	-1.2%
1991	955	-2.2%	716	75%	-1.6%	239	-3.6%
1992	967	1.3%	735	76%	2.7%	232	-2.9%
1993	929	-3.9%	706	76%	-3.9%	223	-3.9%
1994	999	7.5%	786	79%	11.3%	213	-4.5%
1995	973	-2.6%	771	79%	-1.9%	202	-5.2%

NOTE: Conventional pesticides only, excluding sulfur, petroleum oil, wood preservatives, biocides, etc.

SOURCE: EPA estimates.

U.S. Conventional Pesticide Usage: Agricultural and Non-Agricultural Sectors Share, 1964-1995

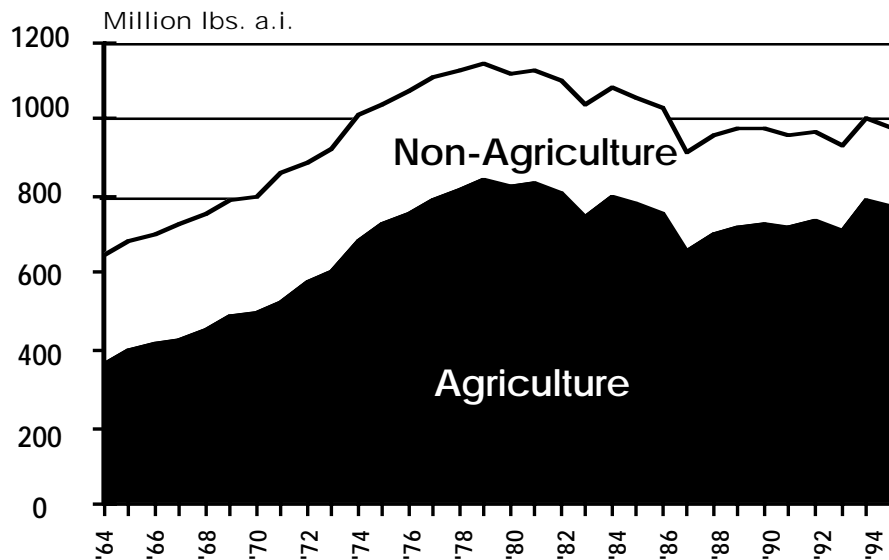
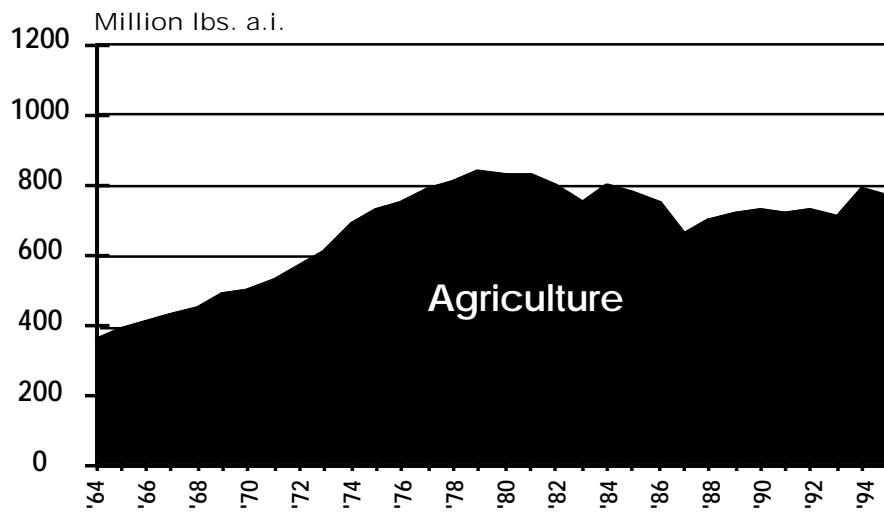
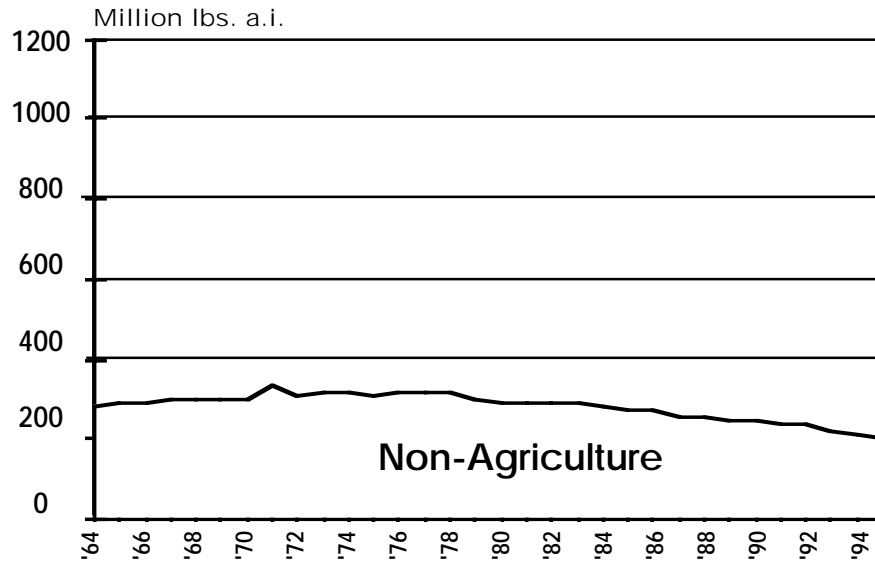


Table 11a.

**Number of Active Ingredients Registered for First Time as Pesticides
Under FIFRA, by Type, Calendar Years 1967-1995.**

Year	TYPE							Total Uses Registered	Total Chemicals Registered
	Insecticide	Herbicide	Fungicide	Bactericide/ Slimicide	Nematicide	Rodenticide	Other		
1967	4	2	2	5	0	2	1	16	16
1968	6	2	5	4	0	0	1	18	18
1969	7	4	0	2	0	0	1	14	14
1970	1	2	2	3	0	0	2	10	10
1971	0	1	1	1	0	1	1	5	4
1972	4	5	6	5	0	0	1	21	17
1973	5	3	4	2	1	0	0	15	13
1974	6	8	6	0	1	1	0	22	22
1975	8	11	5	11	0	0	1	36	35
1976	2	3	2	4	0	0	1	12	12
1977	1	1	0	1	0	0	0	3	3
1978	2	2	0	0	0	0	1	5	5
1979	8	2	4	0	0	1	2	17	17
1980	4	3	1	0	0	2	1	11	11
1981	4	3	2	1	0	0	6	16	16
1982	5	5	1	1	0	2	3	17	17
1983	5	5	3	1	0	0	0	14	14
1984	6	1	2	2	0	1	2	14	13
1985	8	1	1	1	0	0	2	13	10
1986	2	7	0	0	1	0	2	12	11
1987	3	5	0	1	1	0	2	12	11
1988	2	5	1	0	1	0	2	11	11
1989	5	5	3	0	0	0	2	15	15
1990	1	3	2	0	0	1	1	8	8
1991	4	2	4	1	0	0	1	12	12
1992	3	4	4	0	1	0	0	12	11
1993	4	5	7	0	0	0	5	21	20
1994	14	4	8	1	0	0	3	30	30
1995	15	3	6	3	0	2	2	31	31

SOURCE: EPA registration files.

Total New Active Ingredient Pesticide Registrations

First-time Registrations, 1967–1995

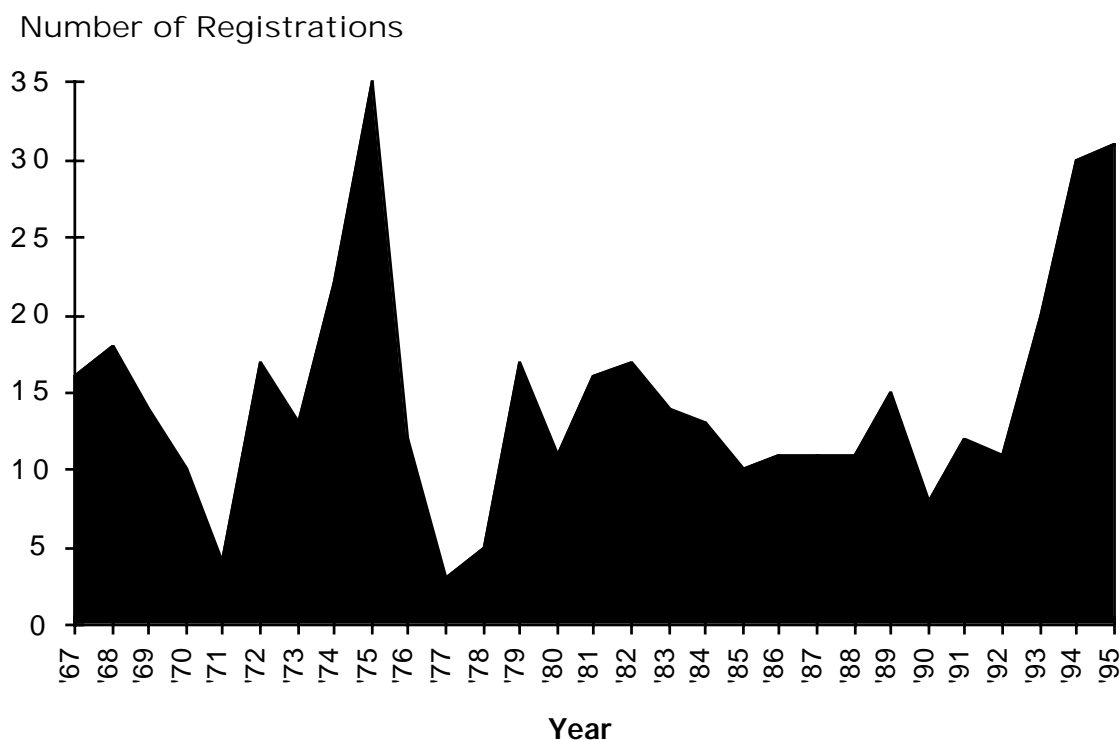


Table 11b.

Number of Active Ingredients Registered for First Time as Pesticides Under FIFRA, by Classification Safer (reduced-risk) or Other Pesticides, Calendar Years 1990-1995.

Year	Safer (Reduced-risk)	Other	Total
1990	3	5	8
1991	7	5	12
1992	6	5	11
1993	5	15	20
1994	16	14	30
1995	19	12	31

SOURCE: EPA registration files.

NOTE: "Safer (reduced-risk)" pesticides is a term EPA applies to pesticides with lower potential for health (or environmental) risks due to their mode of action, being naturally occurring, biologically, or etc.

Table 12.**Number of Certified Applicators in the U.S., 1995 (September 30).**

EPA Region ¹	Private ²	Commercial ³
1	6,924	9,589
2	50,733	63,172
3	45,429	27,221
4	219,157	78,554
5	138,516	61,351
6	236,314	23,191
7	132,963	30,419
8	77,562	19,859
9	23,499	49,608
10	28,990	21,039
U.S. Total ⁴	960,087	384,003

SOURCE: EPA 5700-33H form that states submit to EPA Regions each year.

FOOTNOTES:

- 1 See following page for map of EPA Regions.
- 2 The term "private applicators" refers primarily to individual farmers.
- 3 Commercial refers to professional pesticide applicators.
- 4 The U.S. totals do not add because some applicators are certified in more than one Region.

Certified Pesticide Applicators, 1995

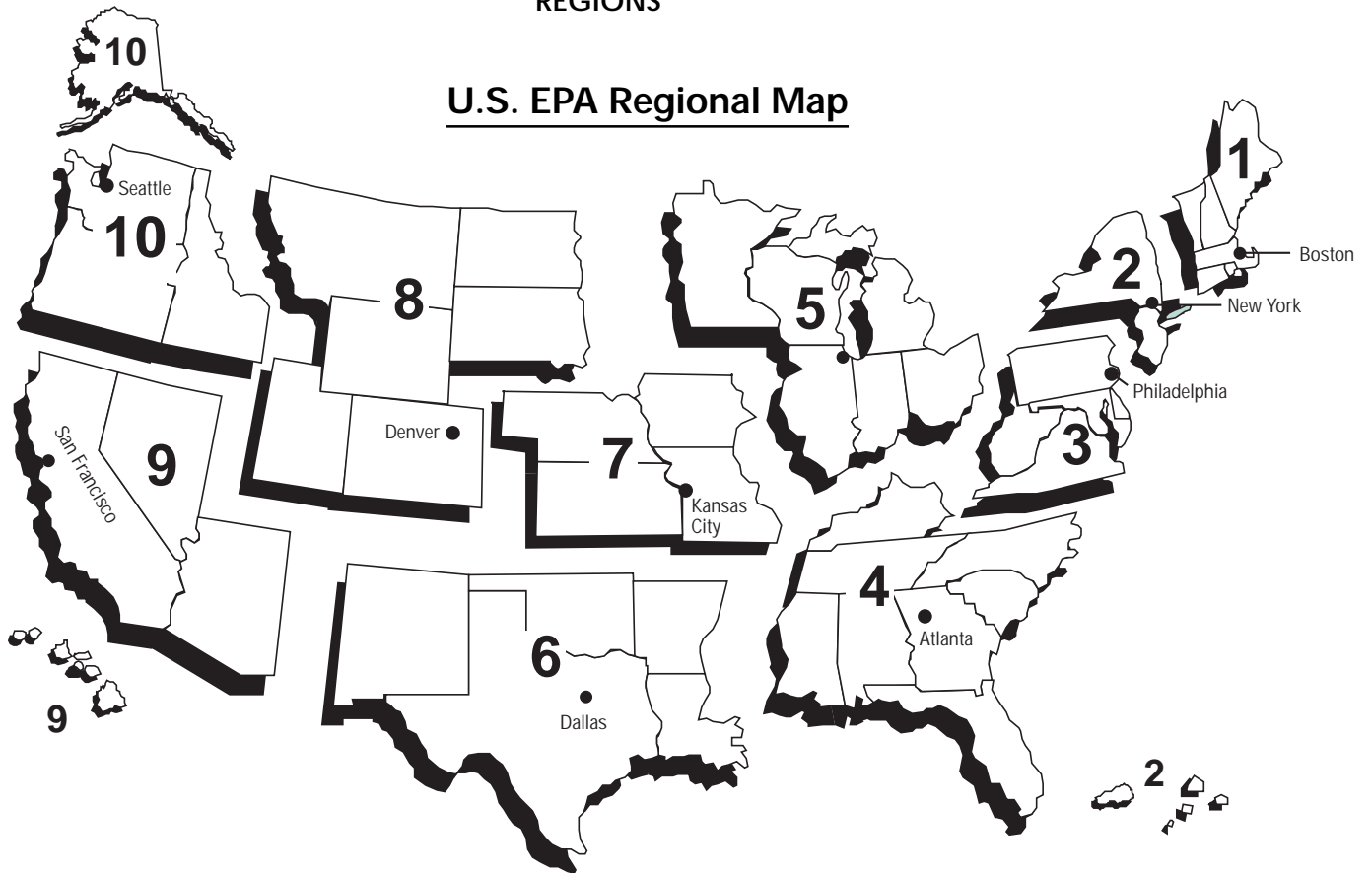
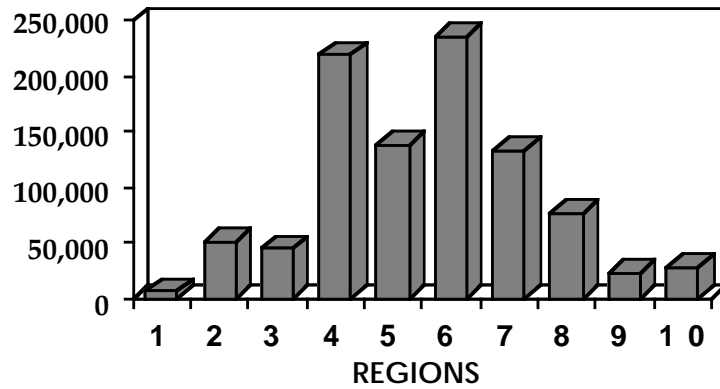
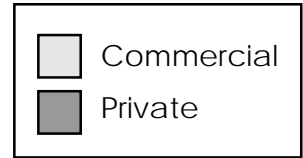
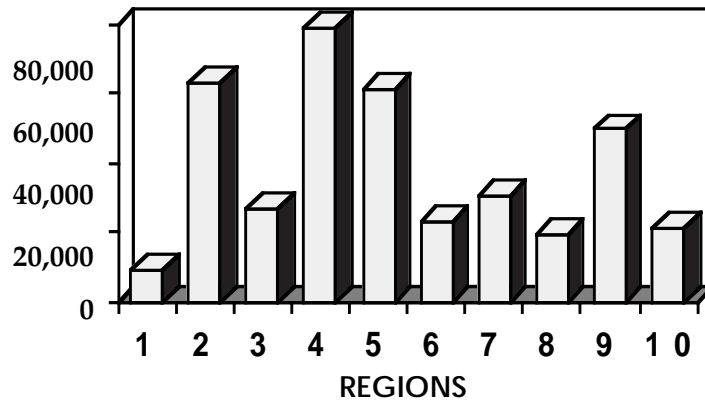


Table 13.

**U.S. Annual Volume of Pesticide Usage, by Type,
All Economic Sectors Combined, 1979-1995.**

Pesticide	Year																
	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
	Millions of lbs. a.i.																
Herbicides	610	622	631	620	573	634	611	590	532	557	567	564	546	554	527	583	556
Insecticides	255	228	218	210	204	197	193	188	152	161	154	148	141	143	130	138	137
Fungicides	124	122	122	117	115	109	110	109	100	99	98	91	86	81	80	79	77
Other Conv.	155	149	152	149	148	145	138	138	133	137	154	173	182	189	192	199	203
Other Chems.	343	321	307	298	287	284	284	278	269	266	251	252	226	246	248	244	249
Total	1487	1442	1430	1394	1327	1369	1336	1303	1186	1220	1224	1228	1181	1213	1177	1243	1222

SOURCE: EPA/OPP/BEAD estimates, 3/97, Table 14.

**Annual Volume of Pesticide Usage
(Total U.S. Volume, by Type 1979-1995)**

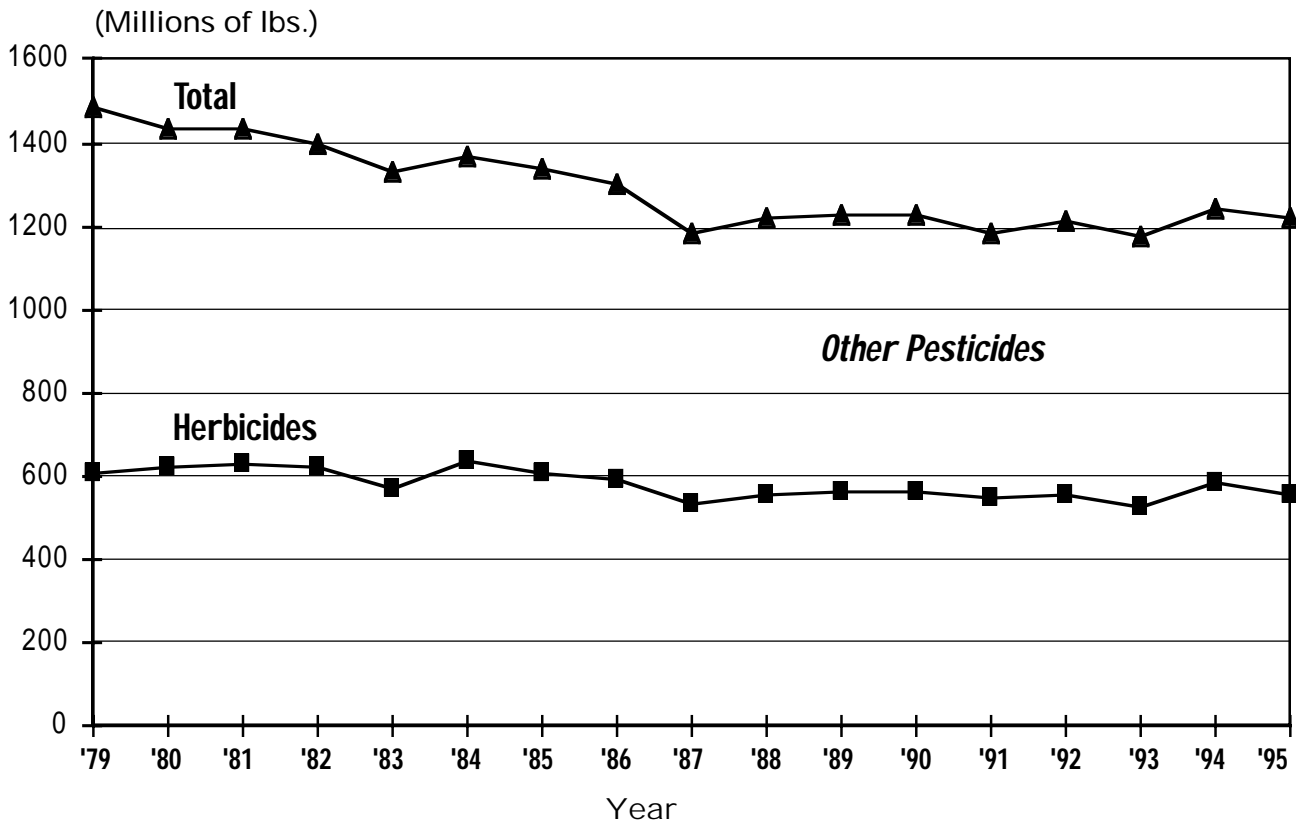


Table 14.

U.S. Annual Volume of Pesticide Usage, by Sector and Type, 1979-1995.

----- AGRICULTURE -----

Pesticide	Year																
	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
	Millions of lbs. a.i.																
Herbicides	492	504	513	503	455	516	501	481	425	450	460	455	440	450	425	485	461
Insecticides	188	163	152	142	135	129	126	121	90	100	95	90	85	90	80	90	91
Fungicides	57	59	62	59	59	56	59	59	52	54	54	50	47	45	47	48	49
Other Conv.	106	100	104	101	100	100	94	94	91	95	113	133	144	150	154	163	170
Other Chems.	246	227	215	207	196	194	194	188	180	177	161	164	140	161	166	163	168
Total	1089	1053	1046	1012	945	995	974	943	838	876	883	892	856	896	872	949	939

SOURCE: EPA/OPP/BEAD estimates, 3/97.

**U.S. Annual Volume of Pesticide Usage in Agriculture
(by Type 1979-1995)**

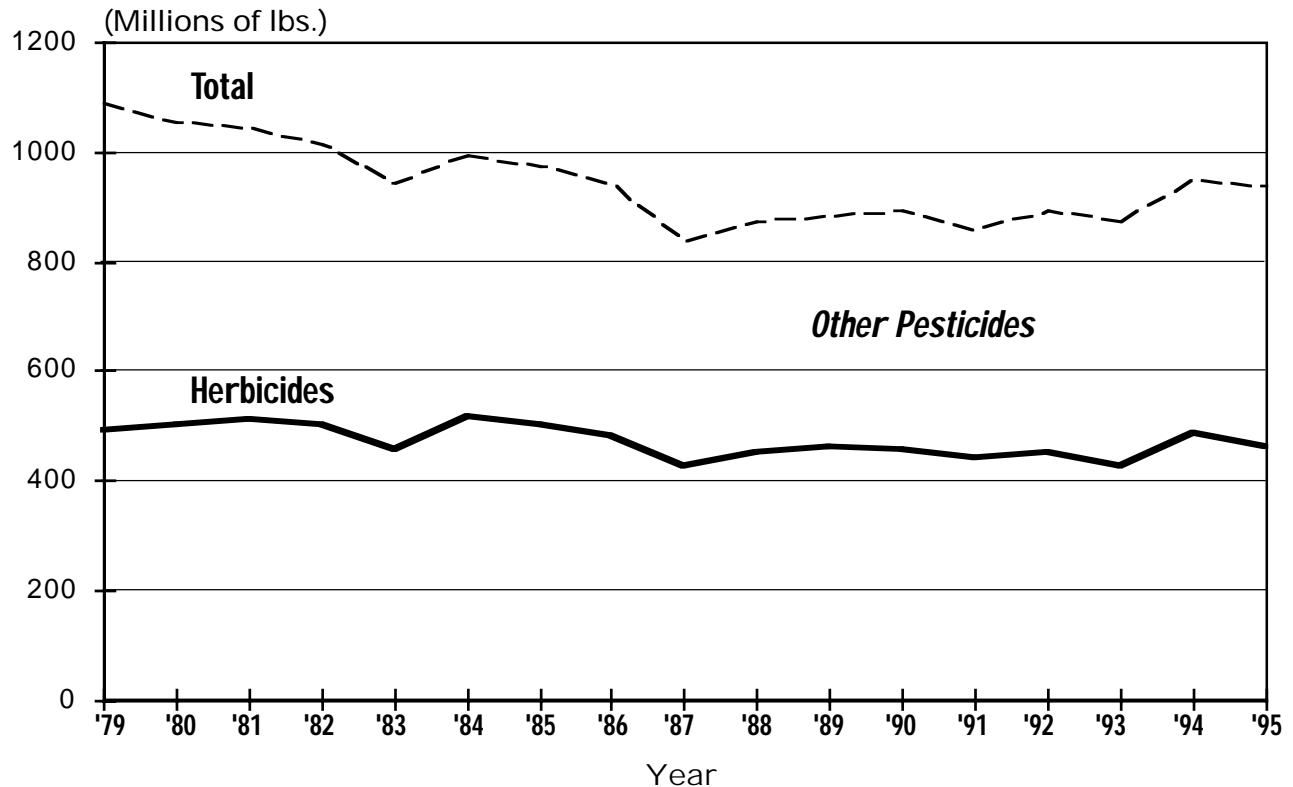


Table 14. (continued)

U.S. Annual Volume of Pesticide Usage, by Sector and Type, 1979-1995.

----- IND./COMM./GOV'T. -----

Pesticide	Year																
	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
	Millions of lbs. a.i.																
Herbicides	85	83	82	80	80	78	70	68	65	64	63	63	60	58	56	52	48
Insecticides	35	35	37	39	40	41	43	45	42	41	40	39	38	35	32	30	29
Fungicides	50	45	43	41	40	38	37	36	34	32	31	31	30	28	25	23	20
Other Conv.	46	46	46	45	45	41	41	41	39	39	38	38	37	36	36	34	31
Other Chems.	27	25	24	24	24	24	23	23	22	22	22	22	21	21	20	20	22
Total	243	234	232	229	229	222	214	213	202	198	194	193	186	178	169	159	150

SOURCE: EPA/OPP/BEAD estimates, 3/97.

**U.S. Annual Volume of Pesticide Usage in Industry, Commercial, & Government
(by Type 1979-1995)**

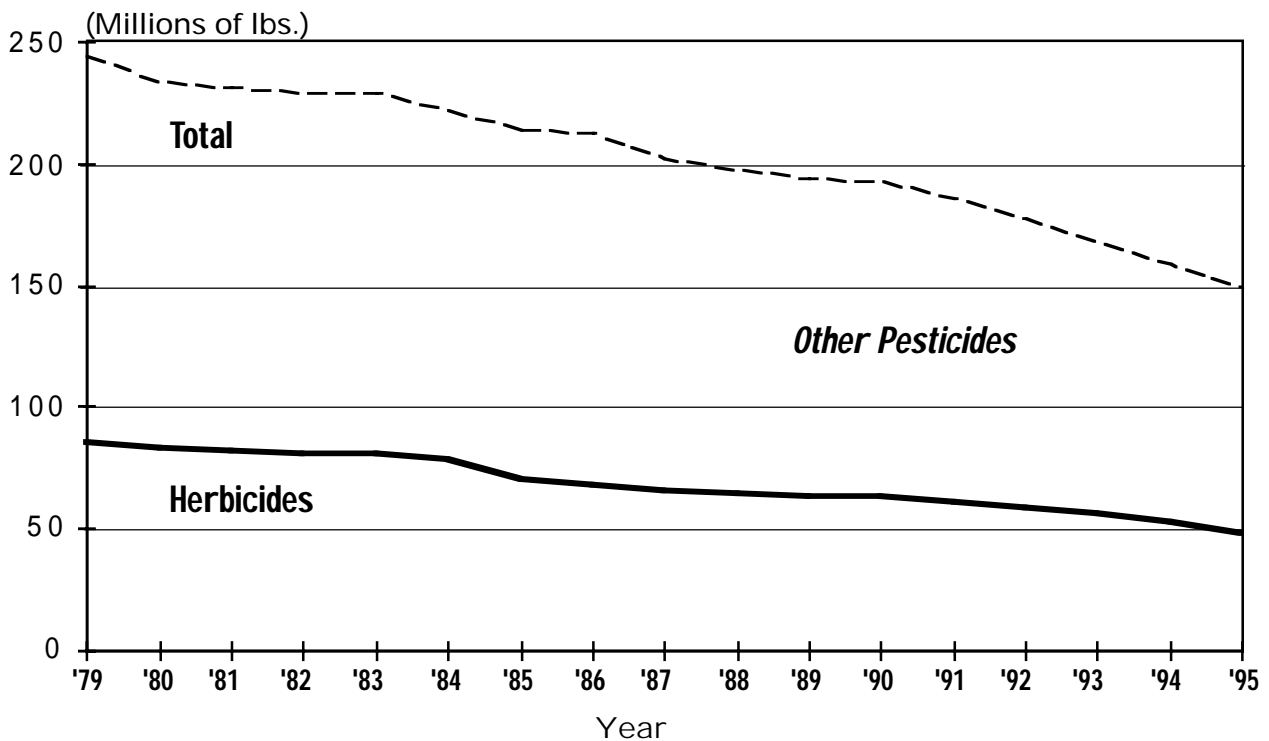


Table 14. (continued)

U.S. Annual Volume of Pesticide Usage, by Sector and Type, 1979-1995.

----- HOME AND GARDEN -----

Pesticide	Year																
	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
	Millions of lbs. a.i.																
Herbicides	33	35	36	37	38	40	40	41	42	43	44	46	46	46	46	46	47
Insecticides	32	30	29	29	29	27	24	22	20	20	19	19	18	18	18	18	17
Fungicides	17	18	17	17	16	15	14	14	14	13	13	10	9	8	8	8	8
Other Conv.	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2
Other Chems.	70	69	68	67	67	67	67	67	67	67	68	66	65	64	62	61	59
Total	155	155	153	153	153	152	148	147	146	146	146	143	140	138	136	135	133

SOURCE: EPA/OPP/BEAD estimates, 3/97.

U.S. Annual Volume of Pesticide Usage in Home & Garden

(by Type 1979-1995)

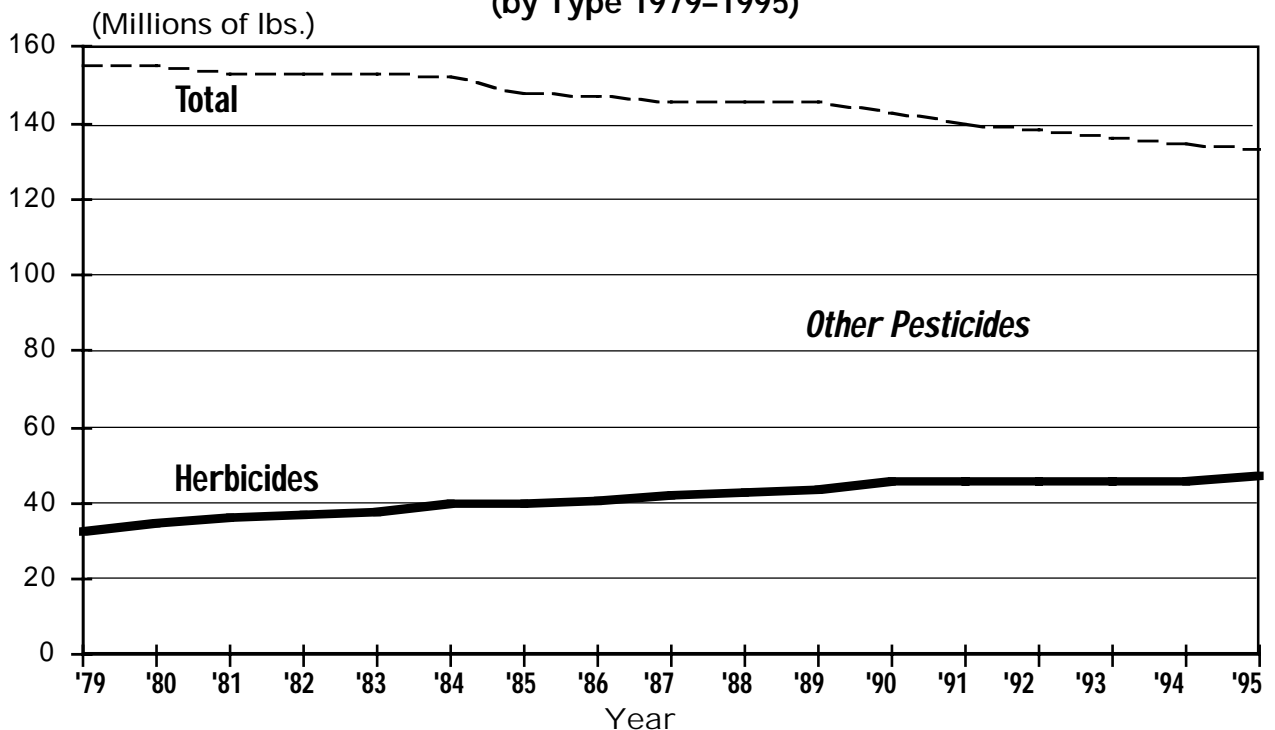


Table 15.

**U.S. Annual User Expenditures on Pesticides, by Type,
All Economic Sectors Combined, 1979-1995.**

Pesticide	Year																
	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
	Millions of \$																
Herbicides	3,026	3,310	3,738	3,772	3,870	4,488	3,920	3,858	3,973	4,121	4,305	4,473	4,682	5,004	5,094	5,944	6,276
Insecticides	1,783	2,037	2,151	2,193	2,360	2,172	2,250	2,271	2,284	2,562	2,699	2,732	2,808	2,904	2,985	3,242	3,552
Fung. & Other	489	459	536	540	731	708	963	967	1,049	1,190	1,141	1,171	1,223	1,183	1,259	1,408	1,488
Total	5,297	5,806	6,425	6,505	6,961	7,368	7,133	7,096	7,306	7,873	8,145	8,376	8,714	9,091	9,339	10,594	11,317

SOURCE: EPA/OPP/BEAD estimates, 3/97, Table 16.

**Annual User Expenditures on Pesticides
(Total U.S. Expenditures, by Type, 1979-1995)**

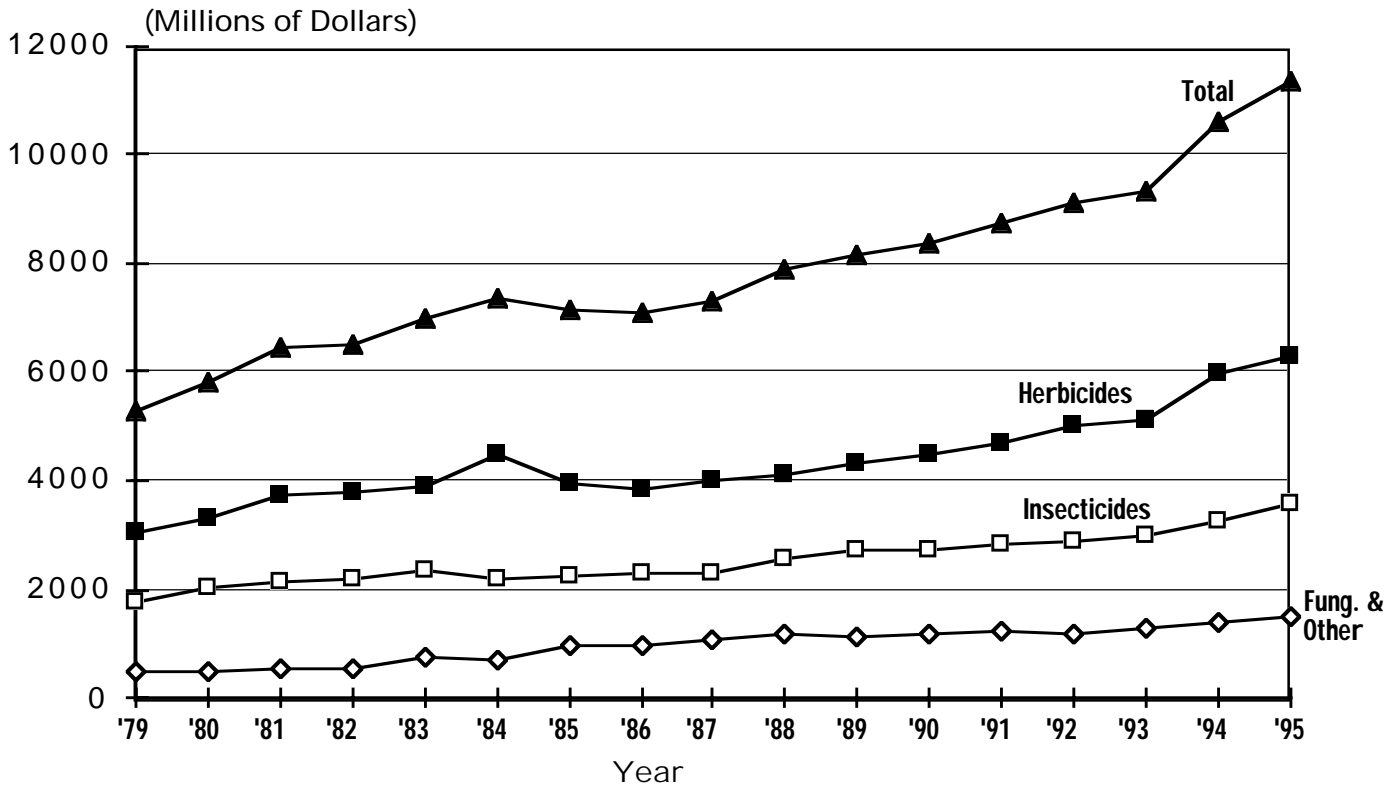


Table 16.

U.S. Annual User Expenditures on Pesticides, by Sector and Type, 1979-1995.

----- AGRICULTURE -----

Pesticide	Year																
	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
	Millions of \$																
Herbicides	2,060	2,300	2,590	2,465	2,800	3,390	2,900	2,775	2,935	3,080	3,255	3,463	3,644	3,915	3,987	4,808	5,112
Insecticides	900	1,095	1,139	1,120	1,300	950	1,100	1,050	1,050	1,110	1,099	1,172	1,208	1,216	1,248	1,453	1,710
Fung. & Other	240	205	272	268	450	418	615	600	650	775	800	842	884	829	895	1,036	1,107
Total	3,200	3,600	4,001	3,853	4,550	4,758	4,615	4,425	4,635	4,965	5,154	5,477	5,736	5,960	6,130	7,297	7,929

SOURCE: EPA/OPP/BEAD estimates, 3/97.

**U.S. Annual User Expenditures on Pesticide for Agriculture
(by Type 1979-1995)**

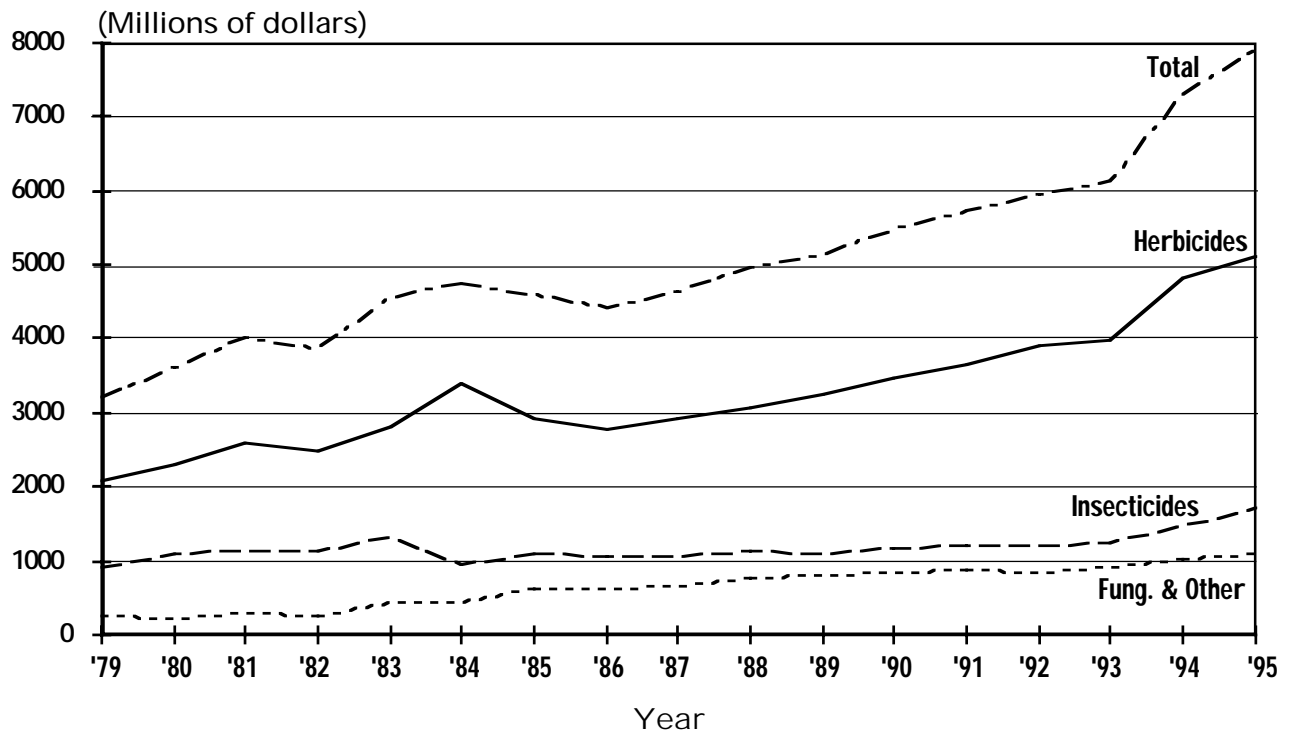


Table 16. (continued)

U.S. Annual User Expenditures on Pesticides, by Sector and Type, 1979-1995.

----- IND./COMM./GOV'T. -----

Pesticide	Year																
	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
	Millions of \$																
Herbicides	672	660	756	852	720	720	600	642	576	600	630	593	616	648	660	679	700
Insecticides	288	312	347	359	360	480	450	486	492	528	480	451	469	498	512	528	543
Fung. & Other	130	132	138	142	144	150	180	192	210	240	180	169	176	186	191	197	202
Total	1,090	1,104	1,241	1,352	1,224	1,350	1,230	1,320	1,278	1,368	1,290	1,213	1,261	1,332	1,363	1,404	1,445

SOURCE: EPA/OPP/BEAD estimates, 3/97.

**U.S. Annual User Expenditures on Pesticide for Industry, Commercial & Government
(by Type 1979-1995)**

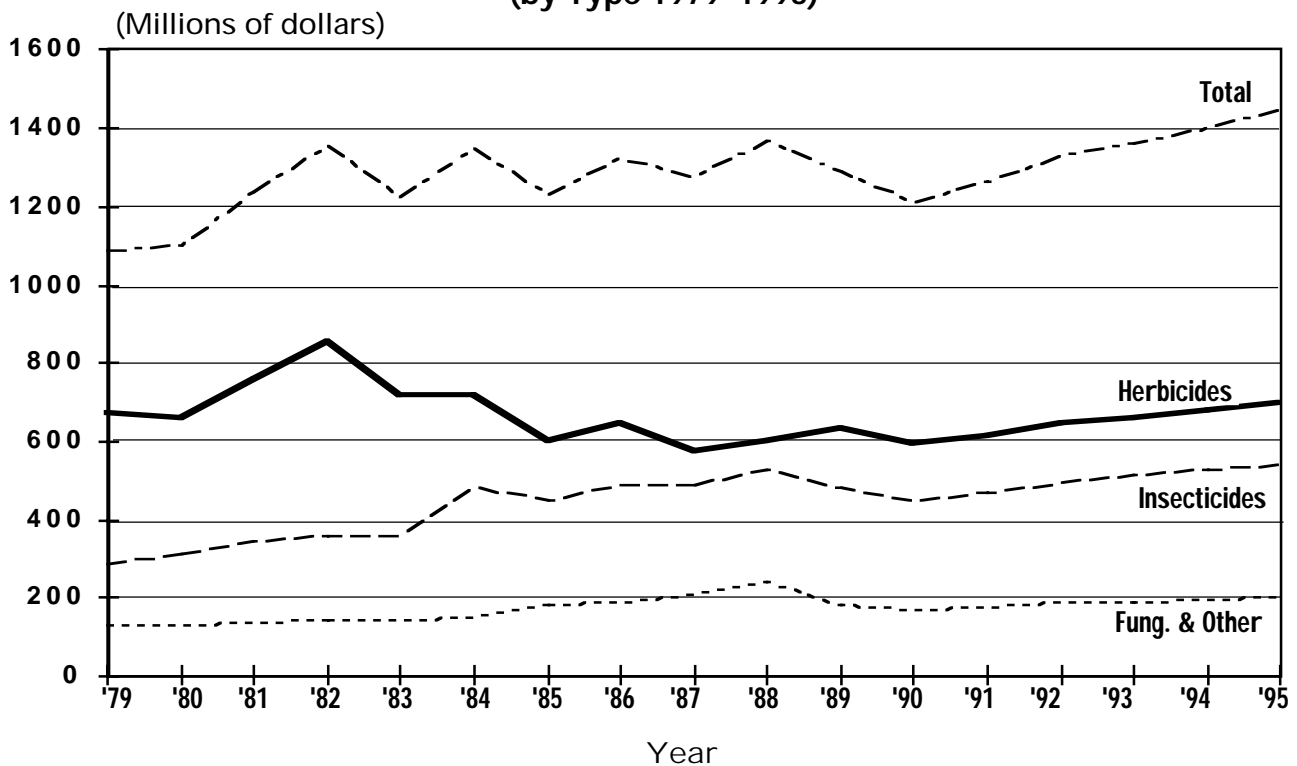


Table 16. (continued)

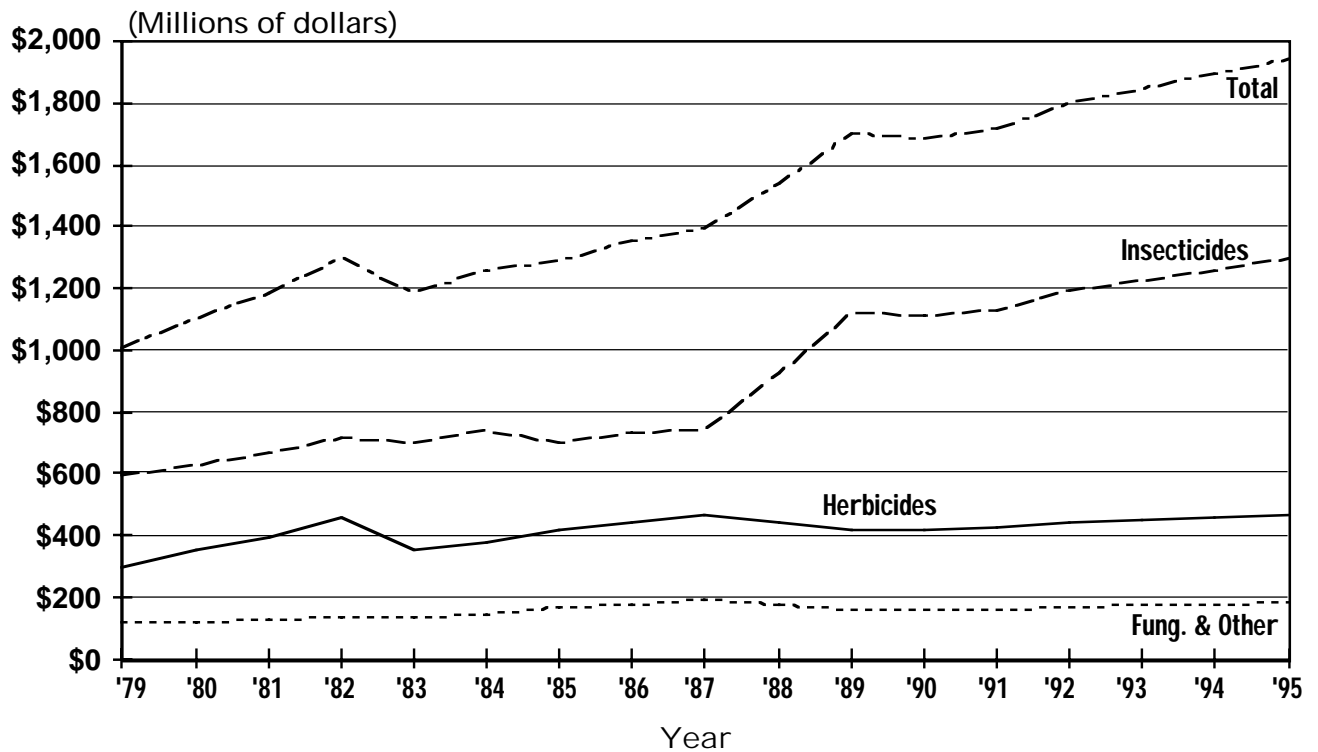
U.S. Annual User Expenditures on Pesticides, by Sector and Type, 1979-1995.

----- HOME AND GARDEN -----

Pesticide	Year																
	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
	Millions of \$																
Herbicides	294	350	392	445	350	378	420	441	462	441	420	417	423	441	446	456	465
Insecticides	595	630	665	714	700	742	700	735	742	924	1120	1109	1131	1190	1225	1261	1299
Fung. & Other	119	122	126	130	137	140	168	175	189	175	161	160	162	168	174	175	179
Total	1,108	1,102	1,183	1,299	1,187	1,260	1,288	1,351	1,393	1,540	1,701	1,686	1,716	1,799	1,845	1,893	1,943

SOURCE: EPA/OPP/BEAD estimates, 3/97.

**U.S. Annual User Expenditures on Pesticide for Home and Garden
(by Type 1979-1995)**





EPA

United States

Environmental Protection Agency

(7503W)

Washington, DC 20460

Official Business

Penalty for Private Use

\$300