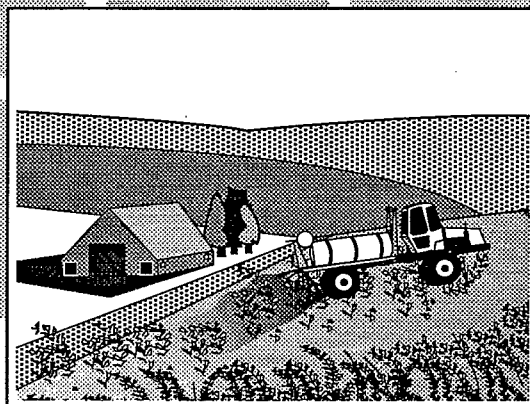
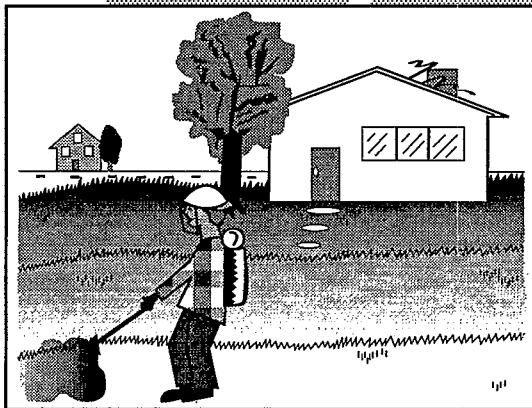


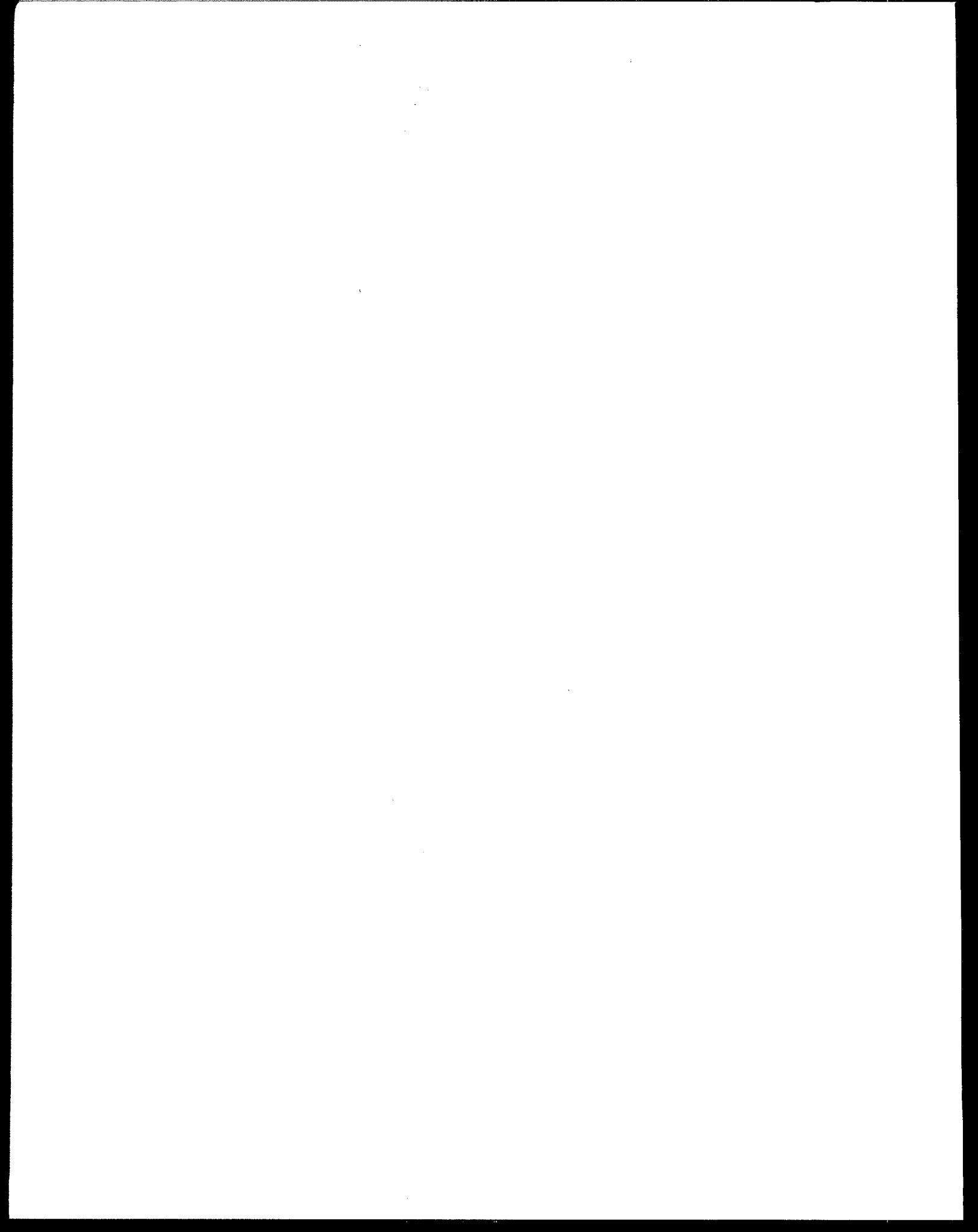


Pesticides Industry Sales And Usage

1992 and 1993 Market Estimates



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Pesticides Industry Sales And Usage

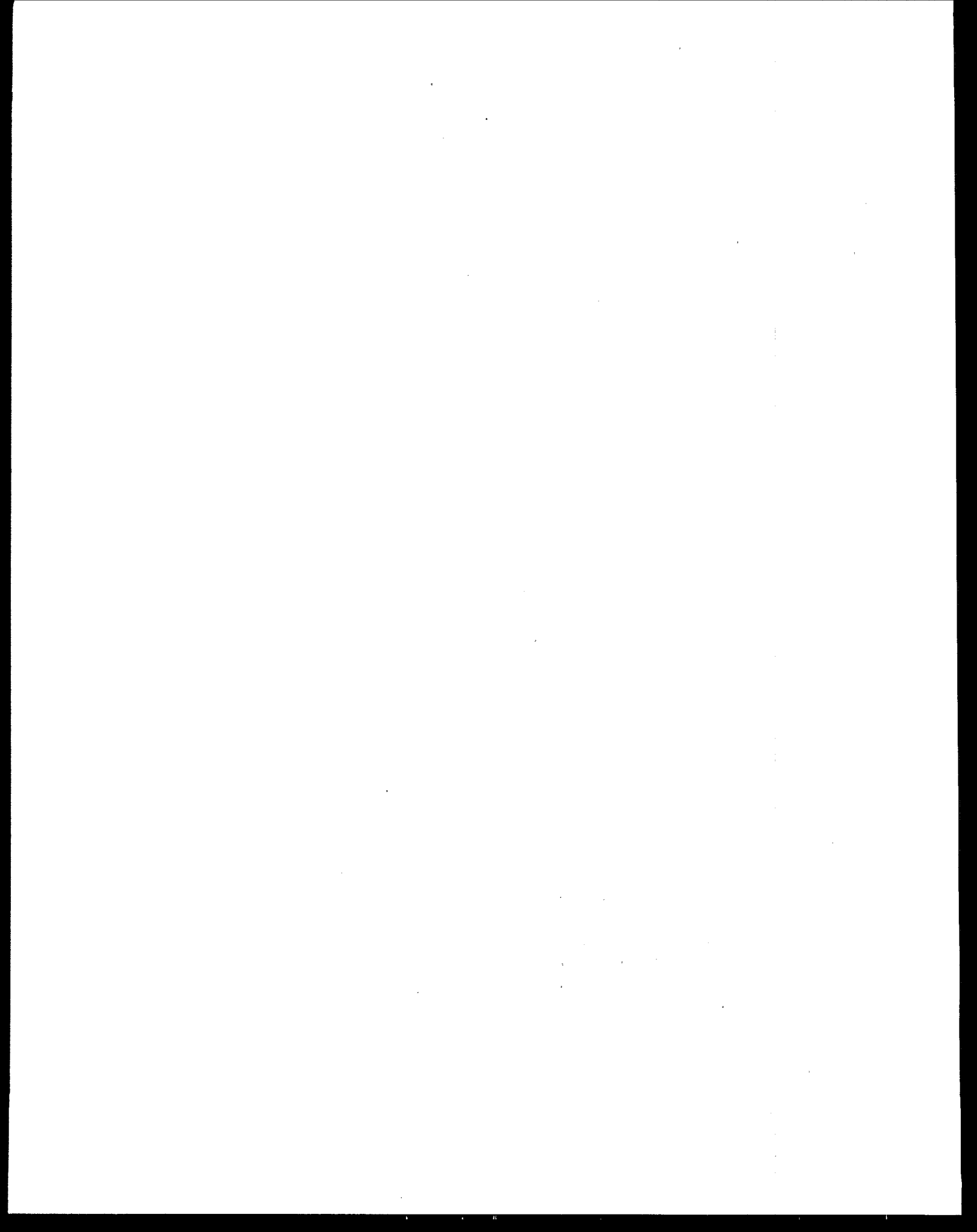
1992 and 1993 Market Estimates

by

Arnold L. Aspelin

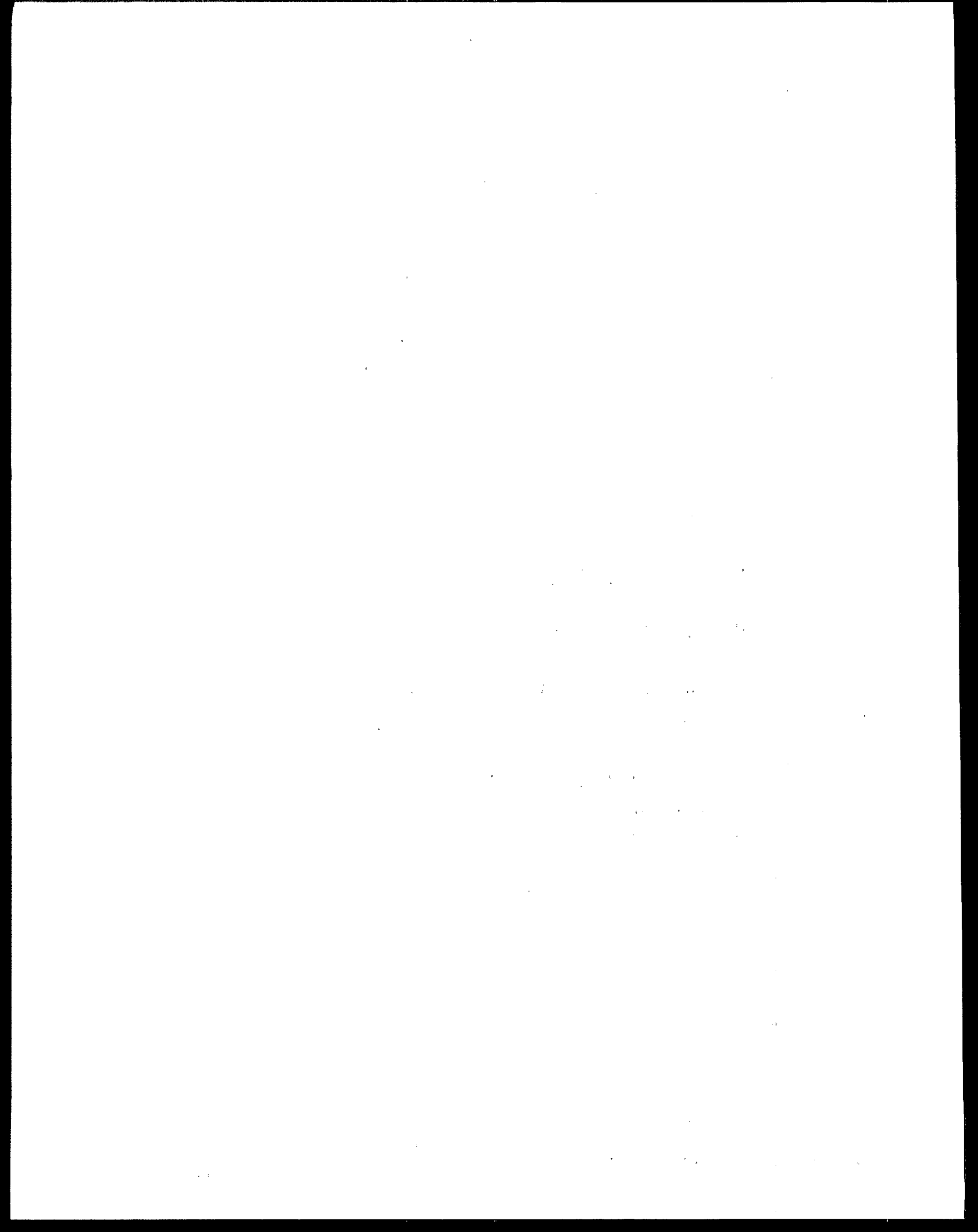
**Biological and Economic Analysis Division
Office of Pesticide Programs
Office of Prevention, Pesticides and Toxic Substances
U.S. Environmental Protection Agency
Washington, DC 20460**

June 1994



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Introduction

This report provides an overview of the pesticide industry for 1992 and 1993. 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 is for the years 1992 and 1993, but historical data are also presented. Graphic versions of the data are included along with a number of the tables. The following page presents a number of highlights of this year's report and page 7 is a listing of the tables in the report.

Overview

Pesticide usage in the U.S. has been relatively stable at about 1.1 billion pounds of active ingredient during recent years. The agricultural share of pesticide usage (see Table 10) appears to have stabilized at about three-fourths of the total after increasing steadily throughout the 1960s and 1970s, primarily due to the expanded use of herbicides in crop production. Growth in the use of pesticides has been slowed by: lower application rates due to the introduction of more potent pesticides, more efficient use of pesticides, and lower farm commodity prices. USDA and EPA are working together with commodity groups to develop plans to reduce use/risk of pesticides as part of a food safety initiative.

The volume of pesticides used for non-agricultural purposes in the U.S. also has been quite stable in recent years at about 275 million pounds of active ingredient (a.i.). This equals about 1.1 pounds per capita in the U.S. (average for 250 million people). Considering all usage, including agricultural, U.S. pesticide usage equals somewhat more than 4 pounds per capita (4.2 pounds in 1993).

The Office of Pesticide Programs, EPA, is conducting a national survey of pesticide applications by certified/commercial pesticide applicators in the U.S. The survey field enumeration was conducted in early 1994 and results are to be available by Fall 1994.

If you have questions regarding this report or need further information, please contact Arnold Aspelin, Economist, BEAD/OPP/EPA (7503W), 401 M Street, SW, Washington, DC 20460—telephone (703) 308-8136.

Acknowledgments

The author of this report would like to acknowledge the valuable assistance provided by the following outside sources:

- John Wilkin and Marypat Corbett, Doane Marketing Research, St. Louis, MO for assistance in estimation of agricultural usage and markets, and
- Phil Calderoni, SRI International, Menlo Park, CA for assistance in estimating non-agricultural and world markets for pesticides.

Highlights of Report

- U.S. pesticide user purchases account for one-third of the world market in dollar terms and one-fourth of active ingredient (*Table 1*).
- Annual U.S. pesticide user expenditures totalled approximately \$8.5 billion in 1993 (*Table 2*). (\$8.2 billion in 1992)
- Agriculture accounts for over 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 1.1 billion pounds of active ingredient of conventional pesticides are used annually in the U.S. (*Table 4*). This usage involves about 21,000 pesticide products and 860 active ingredients registered under the Federal Pesticide Law (*Table 8*).
- Total U.S. pesticide usage in 1993 was about 2.2 billion pounds of active ingredient. (This figure includes wood preservatives, and disinfectants.) (*Table 4*)
- Farmers' expenditures on pesticides equal about 4.2% of total farm production expenditures, up from 3.9% in 1991 (*Table 5*).
- Costs to registrants to meet EPA requirements represent roughly 3.6% of U.S. pesticide expenditures by user community (*Table 6*).
- Net usage of conventional pesticides of about 1.1 billion pounds derives from U.S. production of 1.3 billion, imports of 0.2 billion, and exports of 0.4 billion (pounds of active ingredient of conventional pesticides) (*Table 7*).
- Significant numbers of firms/individuals are involved in the production/distribution of pesticides:
 - 120 leading producers -- 7,300 producing establishments
 - 2,200 formulators -- 17,200 distributors (*Table 8*)
- The use of pesticides occurs on more than 900,000 farms and in about 69 million households (*Table 8*).
- The two most widely used pesticides in U.S. agricultural crop production by volume are the herbicides atrazine and metolachlor (*Table 9a*).
- There were 20 new active ingredients registered as pesticides under FIFRA in calendar year 1993 (*Table 11*) (up from 11 in 1992).
- There are about 1.3 million certified pesticide applicators in the U.S. (*Table 12*). Of these, most are for agricultural applications (nearly 1.0 million) and the remainder (0.35 million) are certified commercial applicators (*Table 12*).
- EPA is nearing completion of a survey of the usage of pesticides by certified/commercial applicators as mandated by Congress in 1988. Results of that survey will be available in late 1994, based on current plans. (*See following section*)

Current Survey Activities

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. This section highlights current activities of EPA and USDA including an overview of EPA's survey of certified/commercial pesticides applicators and USDA's general crop surveys.

It should be noted that EPA also previously completed the National Home and Garden Pesticide Use Survey which was featured in the last edition of the Pesticide Industry Sales and Usage report (Fall 1992).

Certified/Commercial Pesticide Applicator Survey

The 1993 Certified/Commercial Pesticide Applicator Survey (C/CPAS) is the initial EPA effort to collect the needed pesticide usage data from the non-agricultural certified applicator population in order to compile a report to be submitted to the Congress in compliance with the Congressional mandate from the 1990 Food, Agriculture, Conservation and Trade Act.

The survey is providing quantitative information on non-agricultural usage of pesticides by certified/commercial applicators. The following certification categories as defined in 40 CFR Part 171 are covered by the survey:

- Ornamental and Turf Pest Control;
- Aquatic Pest Control;
- Right-of-Way Pest Control;
- Industrial, Institutional, Structural and Health;
- Related Pest Control; and
- Public Health Pest Control.

The 1993 C/CPAS is a national survey of non-agricultural pesticide applicator firms and individual applicators. Many of these applicators are with firms which provide pest control services for clients on a for-hire basis. Coverage also includes applicators working for private companies that apply pesticides only on their own premises as well as applicators who work for Federal, State or local government agencies. A total of 5,504 firms and individual applicators were selected in a random, national sample of this portion of the industry. Of the total, over 2,600 questionnaires have been completed to represent chemical usage. Field enumeration was conducted during February and March, 1994. Preliminary tabulations were not available in time for publication in this report but a comprehensive report is expected before the end of 1994.

Pesticides which are registered by EPA for usage on non-agricultural sites and used by these applicators (or applied under their supervision) are included in the survey. The survey results will include product-specific quantitative information based on purchase records. Also, specific usage patterns will be examined on a sample basis from applicator records of particular pesticide applications.

Key Data Items

- Identification of each pesticide used by product name formulation and EPA registration number.
- Quantity of each product used by type of usage and principal target pest.
- Counts of individual applications of pesticide by: applicator, site and target pest.

For further information about the applicator survey, contact Alan R. Goozner, Statistician, BEAD/OPP/EPA (7503W), 401 M Street, SW, Washington, DC 20460—telephone (703) 308-8147. For information about the overall pesticide usage program, contact Robert F. Esworthy, Chief, Economic Analysis Branch, (same address)—telephone (703) 308-8040.

Agricultural Pesticide Usage Surveys

Since 1990, USDA has been collecting more extensive and more frequent data on agricultural pesticide usage. This is a result of the multi-agency Water Quality and Food Safety Initiatives designed to provide more information for farmers, ranchers and foresters to address water quality, and other environmental issues including pesticide usage. Under the Water Quality and Food Safety Initiatives, USDA's National Agricultural Statistics Service (NASS) has been given the responsibility of collecting on-farm agricultural pesticide usage information along with fertilizer usage information.

NASS's data collection and reporting activities on agricultural pesticide usage are extensive. Included are annual surveys of usage on field crops, vegetables, fruits, and nuts. This is part of NASS's overall mission to collect and publish current statistics for the Nation's agriculture including production, supplies, marketings, prices, weather, and other production inputs. The agricultural pesticide usage surveys are part of the NASS's regular surveying activities directed by a Washington, DC staff and implemented by 45 State Statistical Offices (SSO) that annually survey thousands of farmers.

The pesticide usage surveys cover all significant field crops, vegetables, fruits, and nuts. Specific crops covered in major categories include:

- Field Crops
 - Corn, cotton, potatoes, rice, soybeans, and wheat.
- Vegetable Crops
- Fruit Crops
- Nut Crops
 - Almonds, hazelnuts, pecans, and walnuts.

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". The surveys provide usage information on individual chemicals and the type of information reported includes percent of acres on which a chemical is applied, average number of applications per crop year, rate of active ingredient per application and per crop year, and total pounds of active ingredient applied.

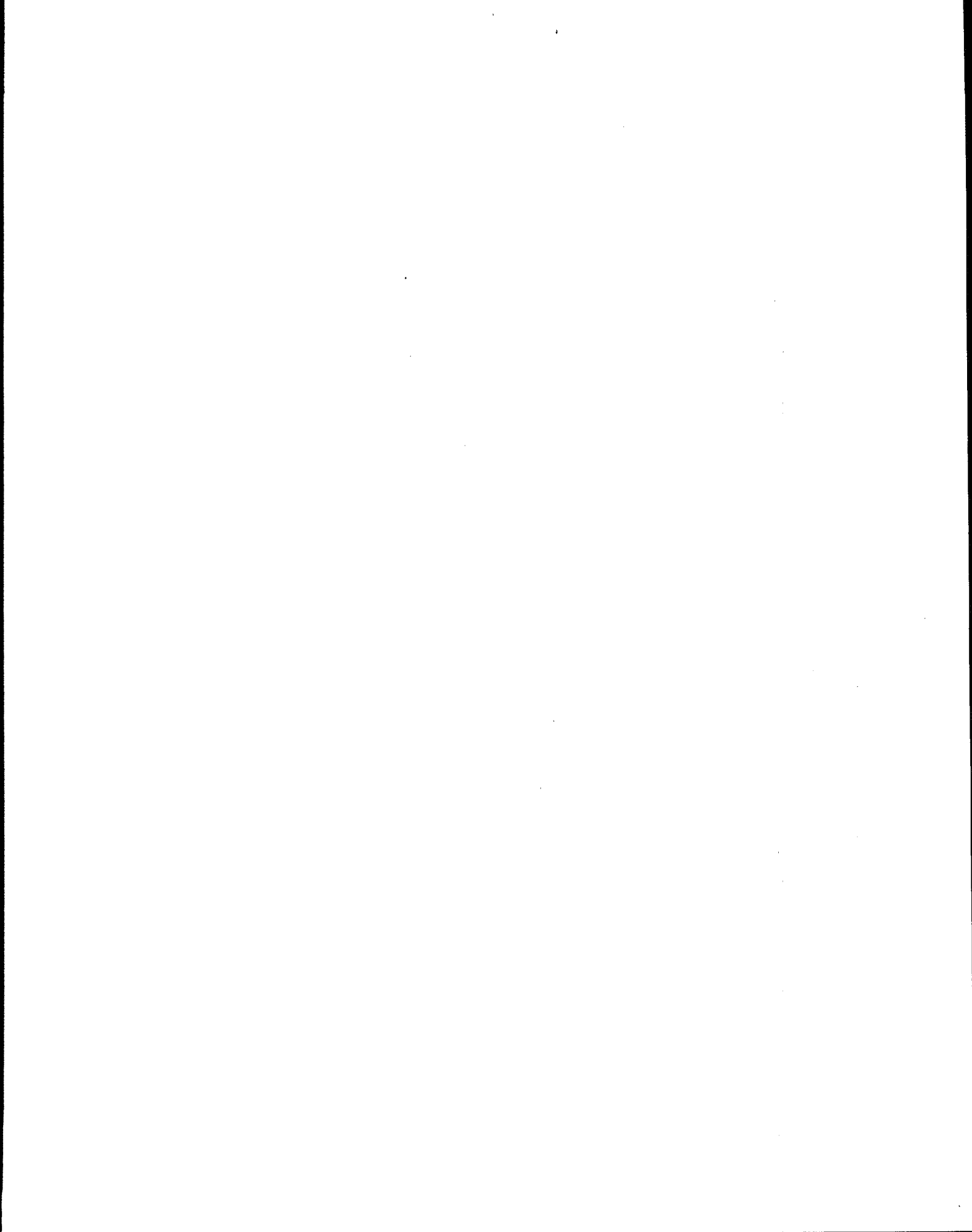
For more information about USDA/NASS pesticide usage surveys, contact Sam Rives, USDA/NASS, 14th & Independence Ave. S.W., Room 5170S, Washington, DC 20250—telephone (202) 720-3896.

Pesticide Use/Risk Reduction Initiative

The Pesticide Use/Risk Reduction initiative, announced in June 1993, is a joint effort of the United States Department of Agriculture, the United States Food and Drug Administration and EPA to reduce the use of pesticides that pose unreasonable risks to humans and the environment. Through a coordinated strategy, the federal government is committed to work with all affected interests (including commodity organizations, public interest groups, federal, state and local government agencies, researchers and industry representatives) to develop a plan which reduces the risks posed by pesticides while maintaining cost-effective pest control methods.

Pesticide usage information plays an important role in the development, implementation and monitoring of the pesticide use/risk reduction strategy. First, pesticide usage information assists in the strategy development phase by outlining the current baseline of pesticide usage and identifying current and historical trends. Second, such information will assist in the strategy implementation phase by serving as an input to the exposure and hazard components of a pesticide risk assessment. Finally, pesticide usage information will assist in the successful monitoring of the effectiveness of the pesticide use/risk reduction strategy by providing information on trends with respect to whether the strategy is having the intended results.

For further information about this initiative, contact Martin S. Lewis, Regulatory Impact Analyst, BEAD/OPP/EPA (7503W), 401 M Street, SW, Washington, DC 20460—telephone (703) 308-8144.



Pesticide Market Estimate Tables and Charts, 1993 and Earlier Years

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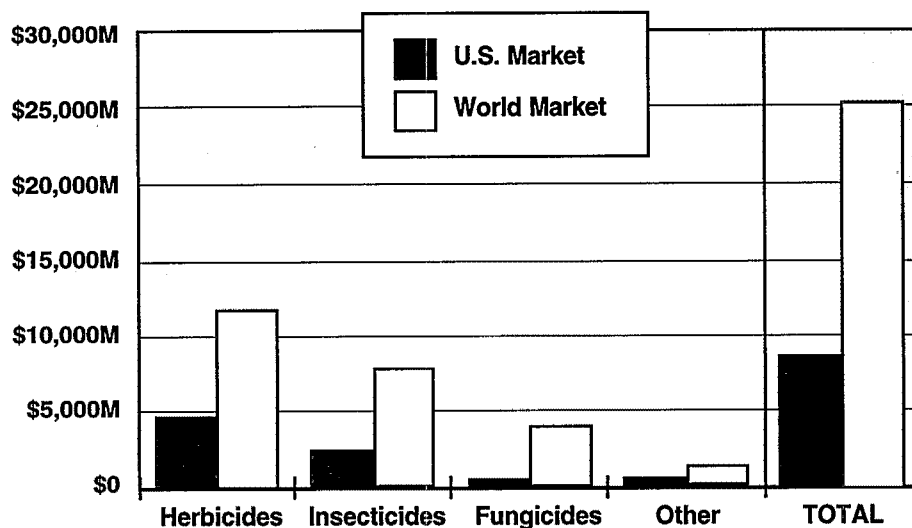
Table 1.**U.S. and World Conventional Pesticide Sales at User Level, 1993 Estimates.**

Pesticide Class	U.S. Market		World Market		U.S. % of World Market
	(Million)	(%)	(Million)	(%)	
User Expenditures (Millions of \$)					
Herbicides	\$4,756	56%	\$11,700	46%	41%
Insecticides	2,550	30%	7,900	31%	32%
Fungicides	584	7%	4,130	16%	14%
Other	594	7%	1,550	6%	38%
Total	\$8,484	100%	\$25,280	100%	34%
Volume of Active Ingredient (Millions of lbs.)					
Herbicides	620	57%	2,110	47%	29%
Insecticides	247	23%	1,625	36%	15%
Fungicides	131	12%	535	12%	24%
Other	83	8%	230	5%	36%
Total	1,081	100%	4,500	100%	24%

NOTE: Totals may not add due to rounding.

SOURCE: EPA estimates based on NACA annual surveys and other sources.

U.S. vs. World Conventional Pesticide Sales User Expenditures, 1993



U.S. vs. World Conventional Pesticide Sales Volume of Active Ingredient, 1993

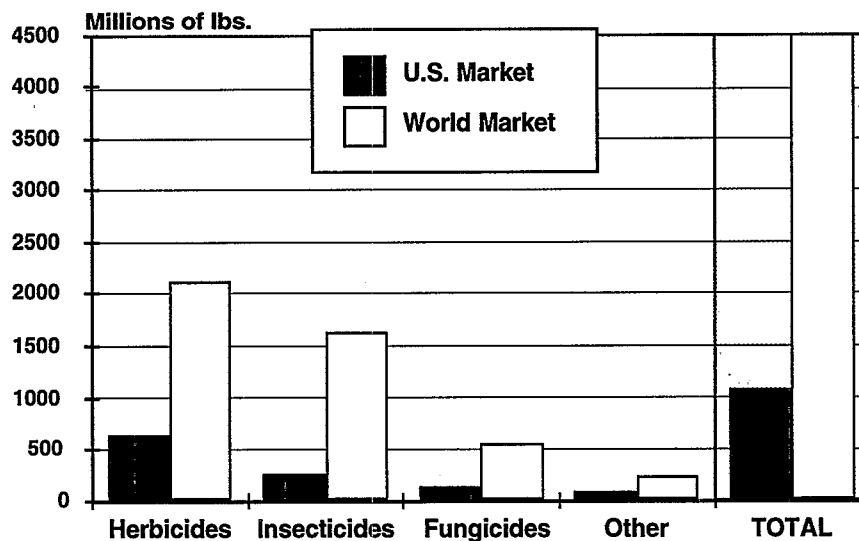


Table 2.**User Expenditures for Conventional Pesticides in the U.S. by Class and Sector,
1992 and 1993 Estimates.**

Sector	Herbicides¹		Insecticides²		Fungicides³		Other⁴		TOTAL	
	(\$M)	(%)	(\$M)	(%)	(\$M)	(%)	(\$M)	(%)	(\$M)	(%)
1992										
Agriculture	\$3,915	84%	\$1,216	49%	\$405	77%	\$424	73%	\$5,960	72%
Ind./Comm./Govt.	540	12%	415	17%	105	20%	50	9%	1,110	13%
Home & Garden	215	5%	850	34%	15	3%	105	18%	1,185	14%
Total	\$4,670	100%	\$2,481	100%	\$525	100%	\$579	100%	\$8,255	100%
1993										
Agriculture	\$3,987	84%	\$1,248	49%	\$461	79%	\$434	73%	\$6,130	72%
Ind./Comm./Govt.	550	12%	427	17%	107	18%	52	9%	1,136	13%
Home & Garden	219	5%	875	34%	16	3%	108	18%	1,218	14%
Total	\$4,756	100%	\$2,550	100%	\$584	100%	\$594	100%	\$8,484	100%

NOTE: Totals may not add due to rounding.

SOURCE: EPA estimates based on NACA annual surveys and other sources.

FOOTNOTES:

- 1 Includes plant growth regulators.
- 2 Includes miticides and contact nematicides.
- 3 Includes sulfur but not wood preservatives.
- 4 Includes rodenticides, fumigants, and molluscicides, but does not include wood preservatives, and disinfectants.

U.S. User Expenditures for Conventional Pesticides, 1993 Estimates

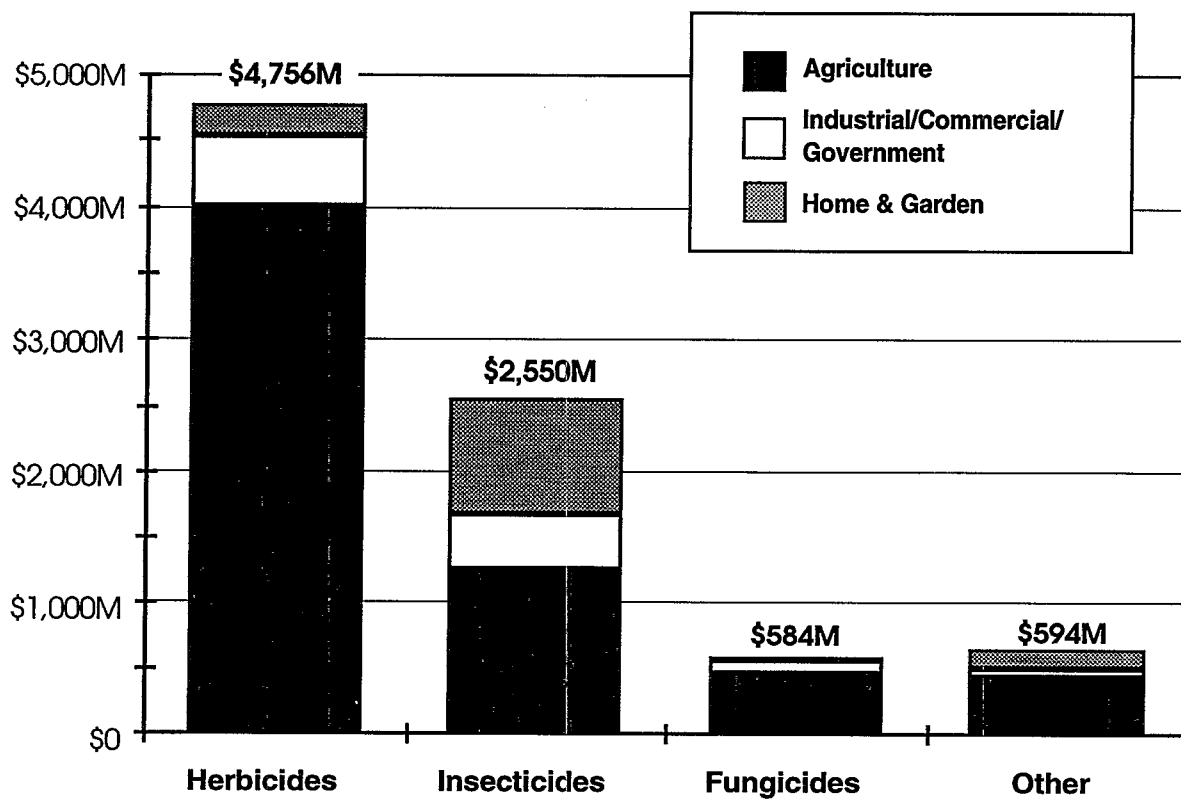


Table 3.

**Volume of Conventional Pesticide Active Ingredient Used in the U.S.
by Class and Sector, 1992 and 1993 Estimates.**

Sector	Herbicides¹		Insecticides²		Fungicides³		Other⁴		TOTAL	
	(M lb.)	(%)	(M lb.)	(%)	(M lb.)	(%)	(M lb.)	(%)	(M lb.)	(%)
1992										
Agriculture	511	79%	181	71%	74	62%	73	90%	839	76%
Ind./Comm./Govt.	110	17%	43	17%	35	29%	5	6%	193	17%
Home & Garden	26	4%	31	12%	11	9%	3	4%	71	6%
Total	647	100%	255	100%	120	100%	81	100%	1,103	100%
1993										
Agriculture	481	78%	171	69%	84	64%	75	90%	811	75%
Ind./Comm./Govt.	112	18%	44	18%	36	27%	5	6%	197	18%
Home & Garden	27	4%	32	13%	11	8%	3	4%	73	7%
Total	620	100%	247	100%	131	100%	83	100%	1,081	100%

NOTE: Totals may not add due to rounding.

SOURCE: EPA estimates based on NACA annual surveys and other sources.

FOOTNOTES:

- 1 Includes plant growth regulators.
- 2 Includes miticides and contact nematocides.
- 3 Includes sulfur but not wood preservatives.
- 4 Includes rodenticides, fumigants, and molluscicides, but does not include wood preservatives, and disinfectants.

U.S. Volume for Conventional Pesticides, 1993 Estimates

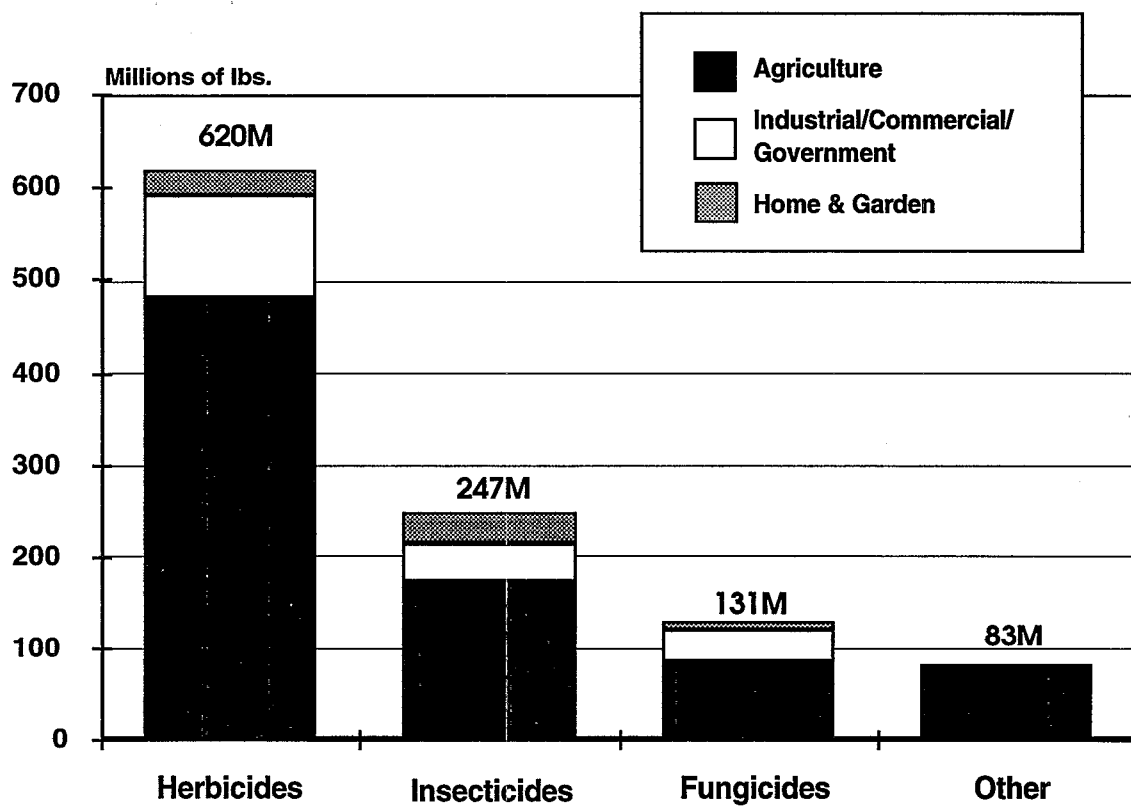


Table 4.**U.S. Usage of Conventional Pesticides and Other Types, 1990—1993 Estimates.**

Type	Billion Pounds a.i.			
	1990	1991	1992	1993
Conventional Pesticides	1.09	1.08	1.10	1.08
Wood Preservatives	.77	.80	.82	.83
Disinfectants ¹	.29	.30	.31	.32
Total	2.15	2.18	2.23	2.23

SOURCE: EPA estimates.

FOOTNOTES:

- 1 This estimate is for disinfectants but not other antimicrobials. It includes food industries, swimming pools/spas, cooling towers, and household and commercial/industrial uses. It does not include chlorine products registered with EPA for disinfectant or drinking water treatment uses.

Table 5.

**Importance of Conventional Pesticide Expenditures to U.S. Farmers,
1991-1993 Estimates.**

	1991		1992		1993	
	\$Billion	Percent	\$Billion	Percent	\$Billion	Percent
Farm Pesticides Expenditures ¹	5.70	3.9%	5.96	4.1%	6.13	4.2%
Total Farm Production Expenses²	146.6	100%	145.4	100%	147.3	100%

SOURCE: USDA and EPA estimates.

FOOTNOTES:

- 1 Excludes wood preservatives, and disinfectants.
- 2 USDA, 1994.

Table 6.

**Annual Costs to Pesticide Registrants to Meet EPA Requirements Compared to
Total User Expenditures for Conventional Pesticides in U.S.,
1991-1993 Estimates.**

	1991		1992		1993	
	\$Million	Percent	\$Million	Percent	\$Million	Percent
Pesticide User Expenditures	7,913	100%	8,255	100%	8,484	100%
Registrant Compliance Costs ¹	275	3.5%	289	3.5%	303	3.6%

SOURCE: EPA estimates, based on the NACA survey data and EPA.

FOOTNOTES:

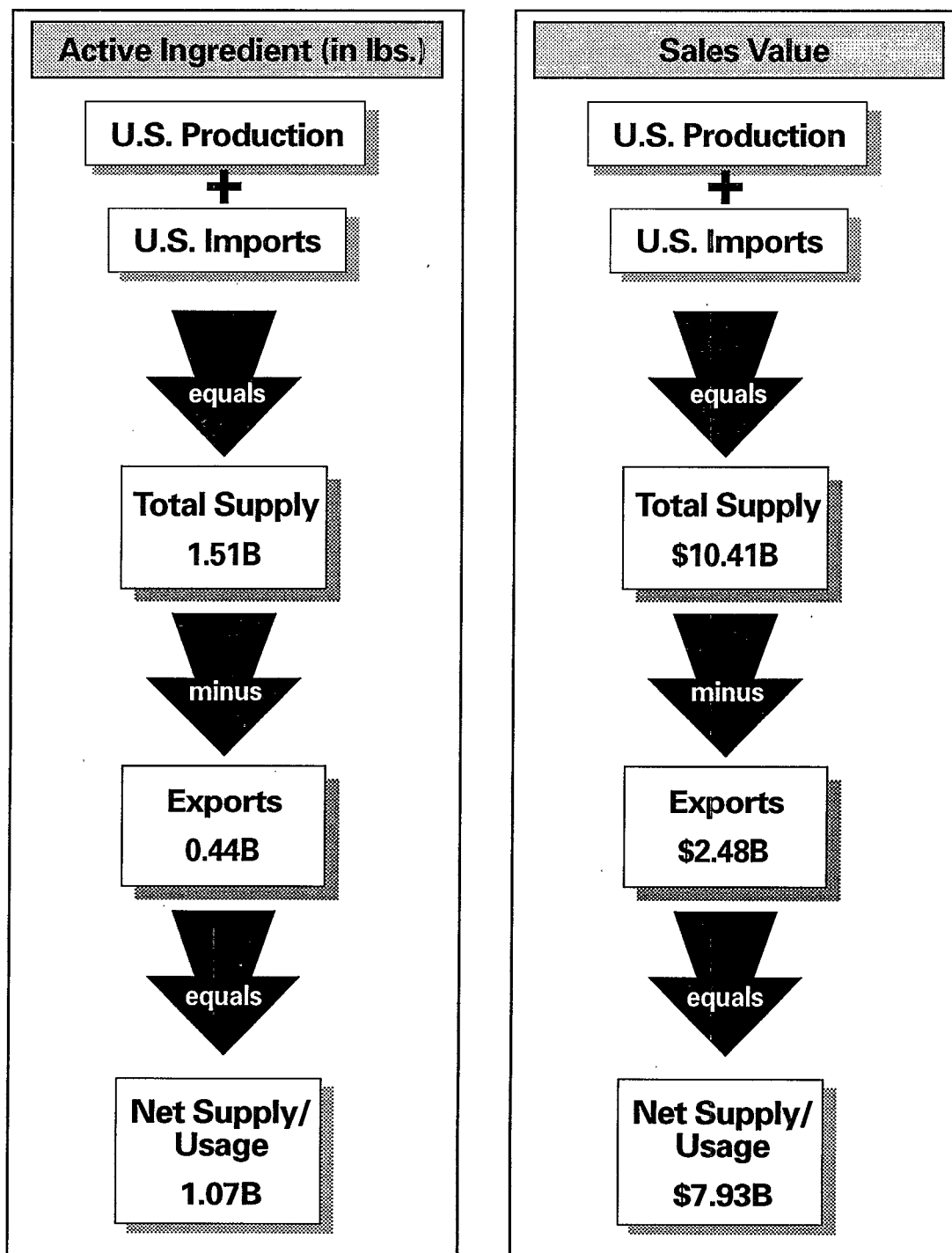
- 1 Total compliance costs for registrants to meet EPA requirements for registrations and for other FIFRA/FFDCA requirements, estimated for 1991 and increased for 1992 and 1993 by 5 percent per year.

Table 7.**U.S. Production, Imports, Exports, and Net Supply of Conventional Pesticides at Producer Level, 1990–1993 Estimates.**

Category	Active Ingredient (in billions of lbs.)				Sales Value (in billions of dollars)			
	1990	1991	1992	1993	1990	1991	1992	1993
U.S. Production	1.30	1.28	1.32	1.30	\$7.60	\$7.78	\$8.01	\$8.25
U.S. Imports	0.18	0.20	0.20	0.21	\$1.61	\$1.76	\$2.10	\$2.16
Total Supply	1.48	1.48	1.52	1.51	\$9.21	\$9.54	\$10.10	\$10.41
U.S. Exports	0.39	0.40	0.42	0.44	\$2.49	\$2.36	\$2.41	\$2.48
Net Supply/Usage	1.09	1.08	1.10	1.07	\$6.72	\$7.18	\$7.69	\$7.93

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

**U.S. Production, Imports, Exports and Net Supply of
Conventional Pesticides, 1993 Estimates**



NOTE: B = billion

Table 8.

**U.S. Pesticide Production, Marketing and User Sectors;
Profile of Numbers of Units Involved, 1993/94 Estimates. (Approximate Values)**

PRODUCTION AND DISTRIBUTION		USER LEVEL	
Basic Production		Agricultural Sector	
1. Major Basic Producers	20	1. Land in Farms	991M acres
2. Other Producers	100	2. Harvested	289M acres
3. Active Ingredients with Active Registrations (Sec. 3 or 24(c))	860	3. Total No. Farms	2.1M
4. Active Ingredients with Food/Feed Tolerances	453	4. No. Farms Using Chemicals for:	
-Raw ag. commodity	278	-Insect on hay/crops	554,000
-Raw animal product	17	-Nematodes	66,000
-Process food	74	-Diseases on crops/orchards	129,000
-Process feed	45	-Weed/grass/bush	913,000
Total Commodities	414	-Defoliation/fruit thinning (above are '87 census no.s)	75,000
5. Number of Tolerances in Place (4/94)	9,341	5. No. Private Pesticide Applicators Registered	965,700
-Raw ag. commodity (Sec. 408)	8,873		
-Food Additive	216		
-Feed Additive	252		
6. Chemical Cases for Re-registration			
-Pre-FIFRA '88	612		
-Post-FIFRA '88	405		
7. Active Ingredients for Re-registration			
-Pre-FIFRA '88	1,138		
-Post-FIFRA '88	590		
8. Re-registrations Completed by 3/31/94 involving:			
-Active Ingredients	96		
-Products	3,063		
-Tolerances	259		
9. New Active Ingredients Registered			
-1992	11		
-1993	20		
10. Total Employment	6,000-10,000		
11. Producing Establishments	7,300		
Distribution and Marketing		Ind./Comm./Gov't Sector	
1. Formulators		1. No. Commercial Pest Control Firms	35,000-40,000
-Major national	150-200	2. No. Certified Commercial Applicators	351,600
-Other	2,000		
2. Distributors and Establishments			
-Major national	250-350		
-Other	16,900		
3. Formulated Products Registered	21,560		
-Federal level	18,360		
-State/24(c)	3,200		
		Home & Garden Sector	
		1. Total U.S. Households	94M
		2. No. Households Using; -('90)	
		-Insecticides	52M
		-Fungicides	36M
		-Herbicides	14M
		-Repellents	17M
		-Disinfectants	40M
		-Any pesticides	69M

SOURCE: EPA estimates.

Table 9a.

Quantities of Pesticides Most Commonly Used in U.S. Agricultural Crop Production
(Approximate Quantities, 1993)

Pesticide	Usage in Million Pounds a.i.
Atrazine	70 - 75
Metolachlor	60 - 65
Sulfur	45 - 50
Alachlor	45 - 50
Methyl-bromide	30 - 35
Cyanazine	30 - 35
Dichloropropene	30 - 35
2,4-D	25 - 30
Metam Sodium	25 - 30
Trifluralin	20 - 25
Petroleum Oil	20 - 25
Pendimethalin	20 - 25
Glyphosate	15 - 20
EPTC	10 - 15
Chlorpyrifos	10 - 15
Chlorothalonil	10 - 15
Propanil	7 - 12
Dicamba	6 - 10
Terbufos	5 - 8
Bentazone	4 - 7
Mancozeb	4 - 7
Copper Hydroxide	4 - 7
Parathion	4 - 7
Simazine	3 - 6
Butylate	3 - 6

SOURCE: EPA estimates based on a variety of sources.

Table 9b.

Quantities of Pesticides Most Commonly Used in Non-Agricultural Sectors of U.S.
(Approximate Quantities, 1993)

Pesticide	Usage in Million Pounds a.i.
2,4-D	12 - 15
Chlorpyrifos	9 - 12
Diazinon	8 - 10
Glyphosate	4 - 6
Malathion	4 - 6
Dicamba	3 - 5
Diuron	3 - 5
Naled	3 - 5
MCPP	3 - 5
Carbaryl	2 - 4

SOURCE: EPA estimates based on a variety of sources.

Table 10.**United States Conventional Pesticide Usage, Total and Estimated Agricultural Sector Share, 1964-1993.**

Year	Total U.S.	Agricultural Sector	
		Million lbs. a.i.	
1964	540	320	59%
1965	610	335	55%
1966	680	350	51%
1967	735	380	52%
1968	835	470	56%
1969	775	430	55%
1970	740	430	58%
1971	835	495	59%
1972	875	525	60%
1973	910	560	62%
1974	950	590	62%
1975	990	625	63%
1976	1,030	660	64%
1977	1,075	720	67%
1978	1,110	780	70%
1979	1,058	840	79%
1980	1,075	846	79%
1981	1,101	860	78%
1982	1,056	815	77%
1983	963	733	76%
1984	1,080	850	79%
1985	1,112	861	77%
1986	1,096	820	75%
1987	1,087	814	75%
1988	1,130	845	75%
1989	1,070	806	75%
1990	1,086	834	77%
1991	1,077	817	76%
1992	1,103	839	76%
1993	1,081	811	75%

NOTE: Excludes wood preservatives and disinfectants.

SOURCE: EPA estimates.

U.S. Conventional Pesticide Usage and Agricultural Sector Share, 1964-1993

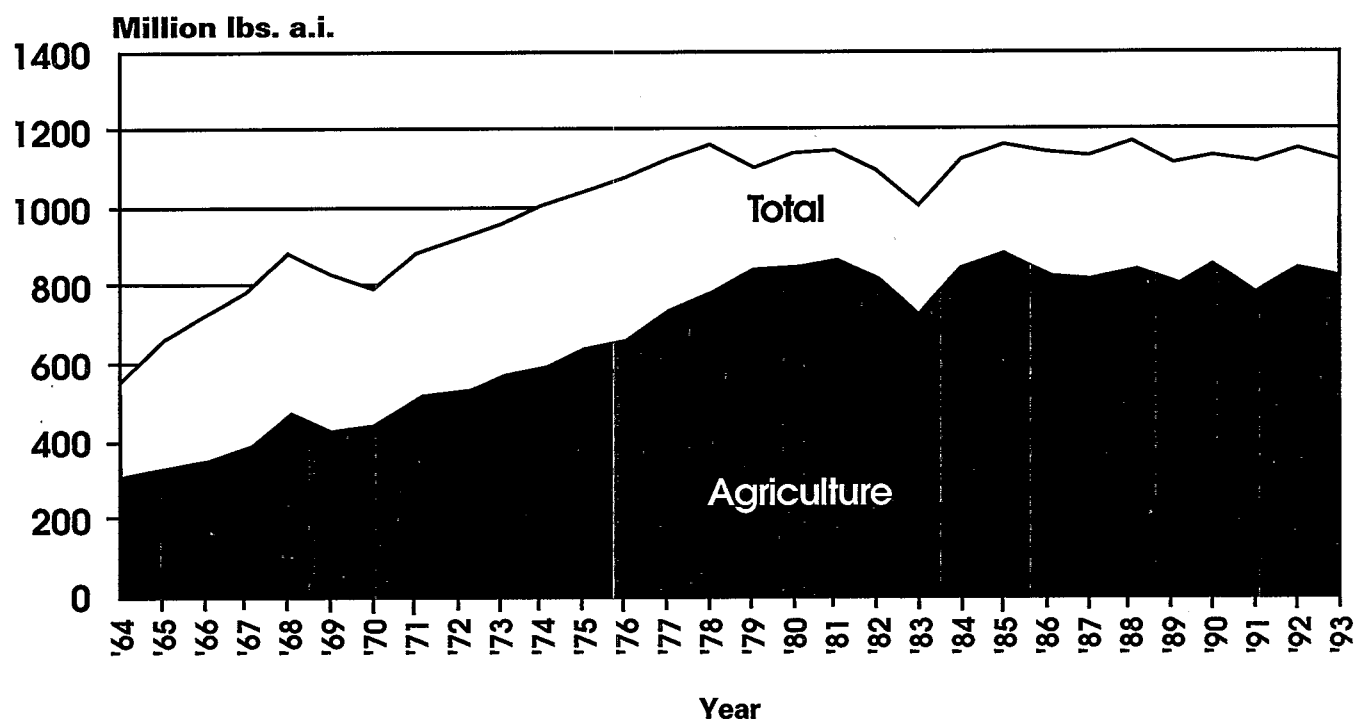


Table 11.

**Number of Chemicals Registered for First Time as Pesticides Under FIFRA,
by Type, Calendar Years 1967-1993.**

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

SOURCE: EPA registration files.

Total New Chemical Active Ingredient Pesticide Registrations

First-time Registrations, 1967-1993

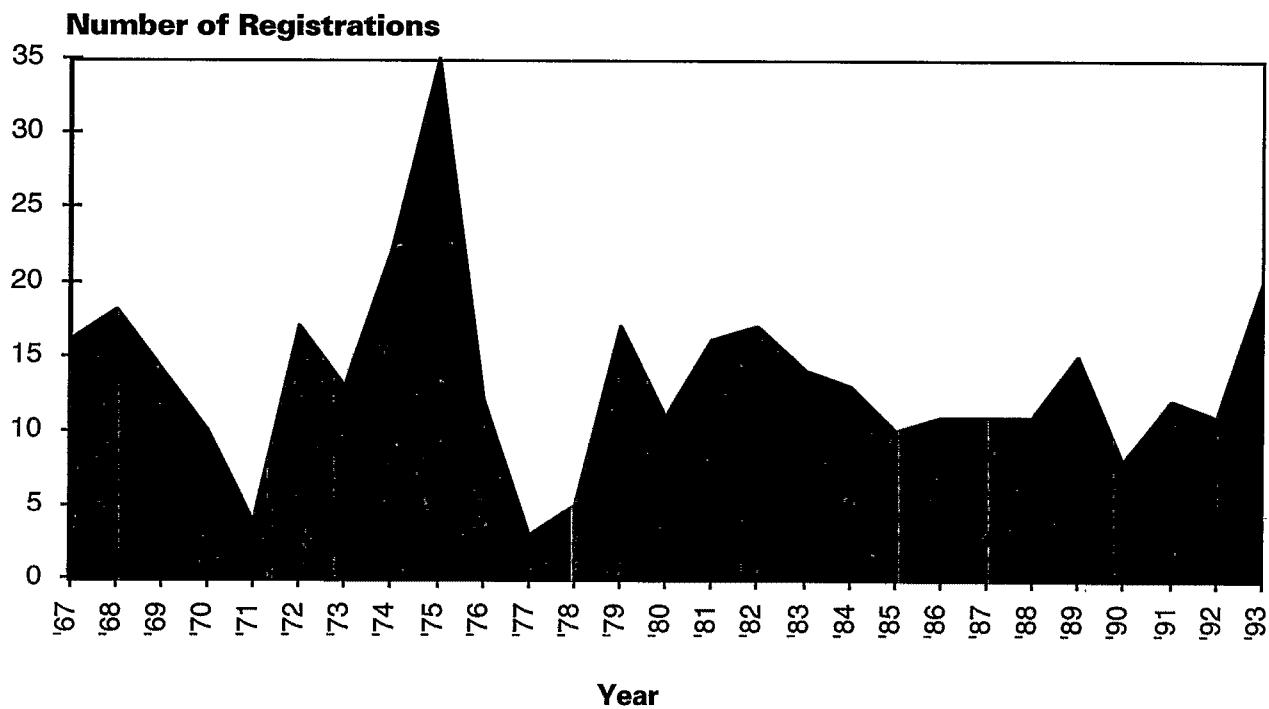


Table 12.**Number of Certified Applicators in the U.S., 1993 Estimates.**

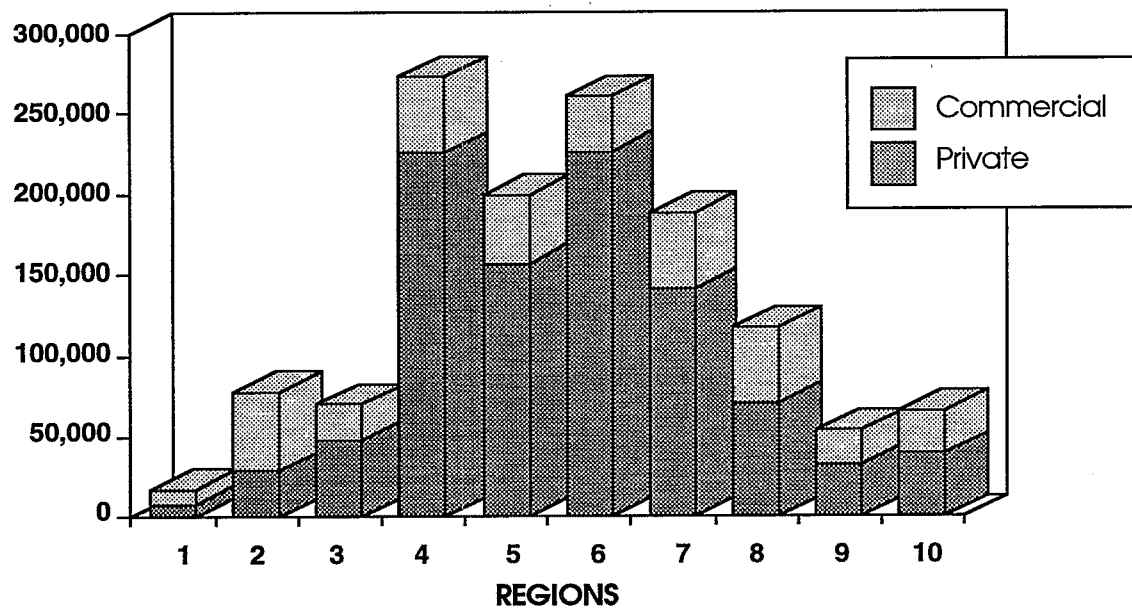
EPA Region¹	Private²	Commercial³
1	7,240	8,703
2	49,802	54,607
3	48,801	25,760
4	217,815	69,406
5	149,228	54,254
6	248,095	30,572
7	131,492	27,606
8	56,324	14,376
9	26,576	47,912
10	30,142	18,365
U.S. Total⁴	965,692	351,561

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, 1993



U.S. EPA Regional Map

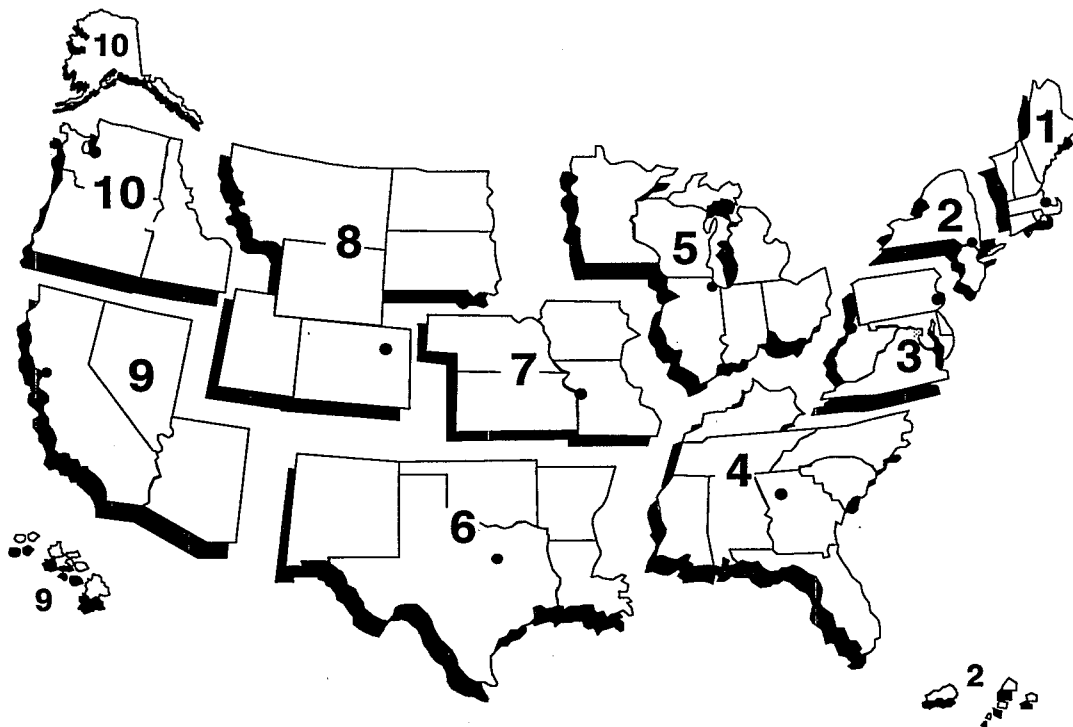


Table 13.

U.S. Annual Volume of Pesticide Usage, by Type, 1979-1993.

Pesticide	Year														
	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
	Millions of lbs. a.i.														
Herbicides	560	555	570	544	575	675	670	655	645	660	655	644	628	647	620
Insecticides	378	395	405	391	255	270	300	295	260	268	226	245	249	255	247
Fungicides	66	78	80	76	78	80	82	86	122	132	111	116	120	120	131
Other	54	47	46	45	55	55	60	60	60	70	78	81	80	81	83
Total	1,058	1,075	1,101	1,056	963	1,080	1,112	1,096	1,087	1,130	1,070	1,086	1,077	1,103	1,081

SOURCE: EPA/OPP/BEAD estimates.

Annual Volume of Pesticide Usage

(Total U.S. Volume, by Type 1979-1993)

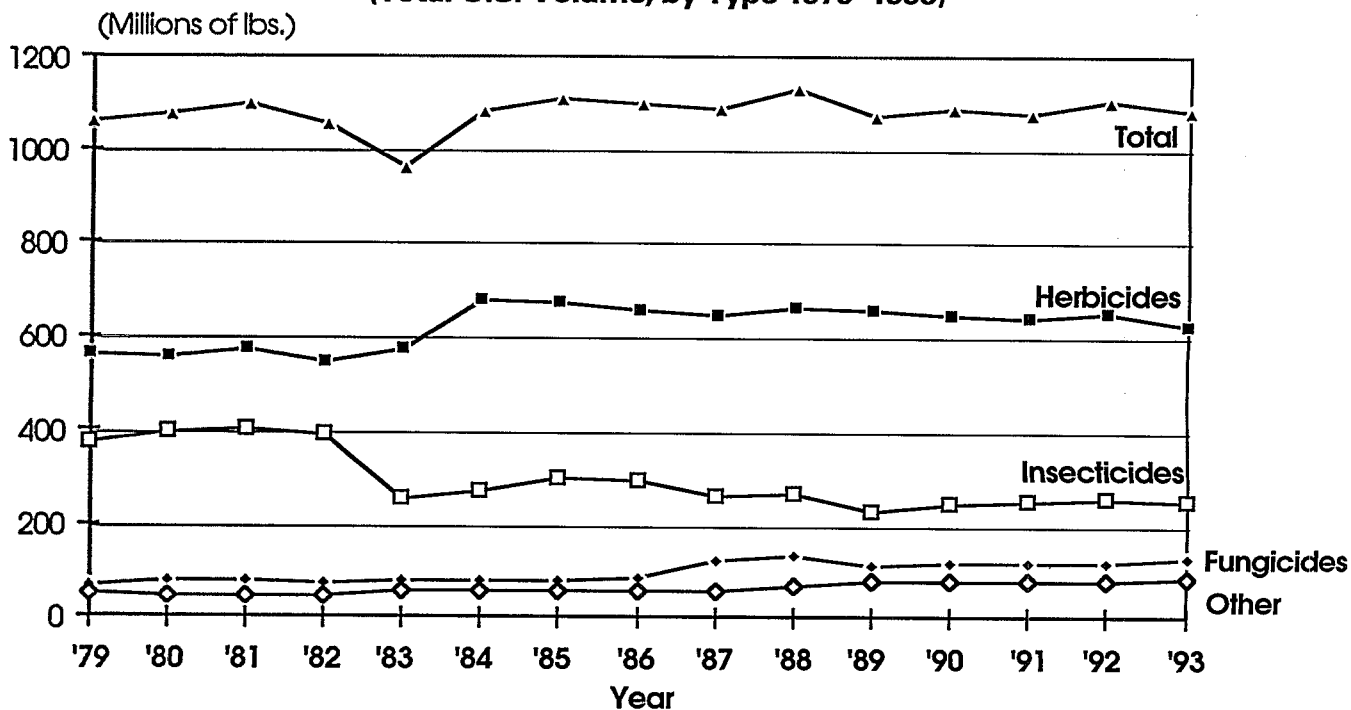


Table 14.

U.S. Annual Volume of Pesticide Usage, by Sector and Type, 1979-1993.

AGRICULTURE

Pesticide	Year														
	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
	Millions of lbs. a.i.														
Herbicides	488	445	456	430	445	545	525	500	505	510	520	516	495	511	481
Insecticides	302	306	309	295	185	200	225	210	179	185	151	173	175	181	171
Fung. & Other	90	95	95	90	103	105	111	110	130	150	135	145	147	147	159
Total	840	846	860	815	733	850	861	820	814	845	806	834	817	839	811

SOURCE: EPA/OPP/BEAD estimates, Annual publications, 1979-1993

U.S. Annual Volume of Pesticide Usage in Agriculture

(by Type 1979-1993)

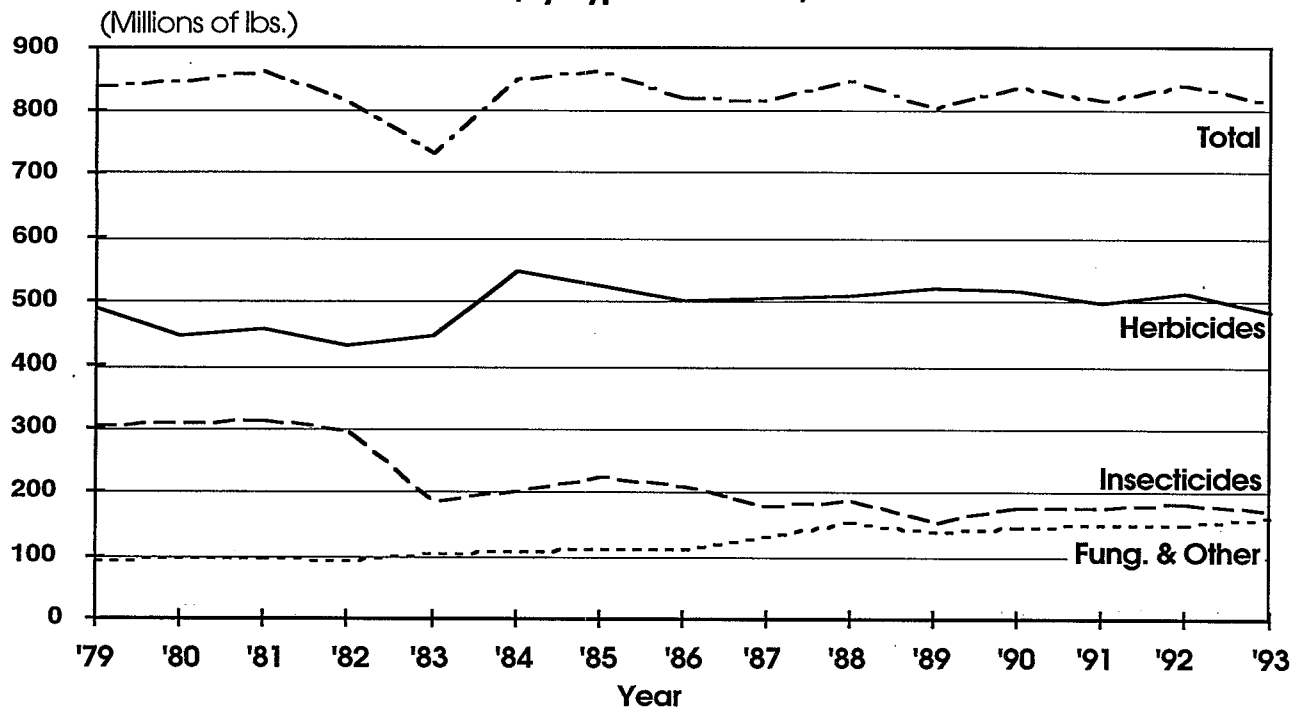


Table 14. (continued)

U.S. Annual Volume of Pesticide Usage, by Sector and Type, 1979-1993.

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

Pesticide	Year														
	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
	Millions of lbs. a.i.														
Herbicides	84	82	86	86	105	105	115	125	115	120	110	103	108	110	112
Insecticides	38	47	48	48	40	40	40	45	45	45	45	42	44	43	44
Fung. & Other	18	18	19	19	20	20	21	25	40	40	40	38	39	40	41
Total	140	147	153	153	165	165	176	195	200	205	195	183	191	193	197

SOURCE: EPA/OPP/BEAD estimates, Annual publications, 1979-1993

U.S. Annual Volume of Pesticide Usage in Industry, Commercial, & Government

(by Type 1979-1993)

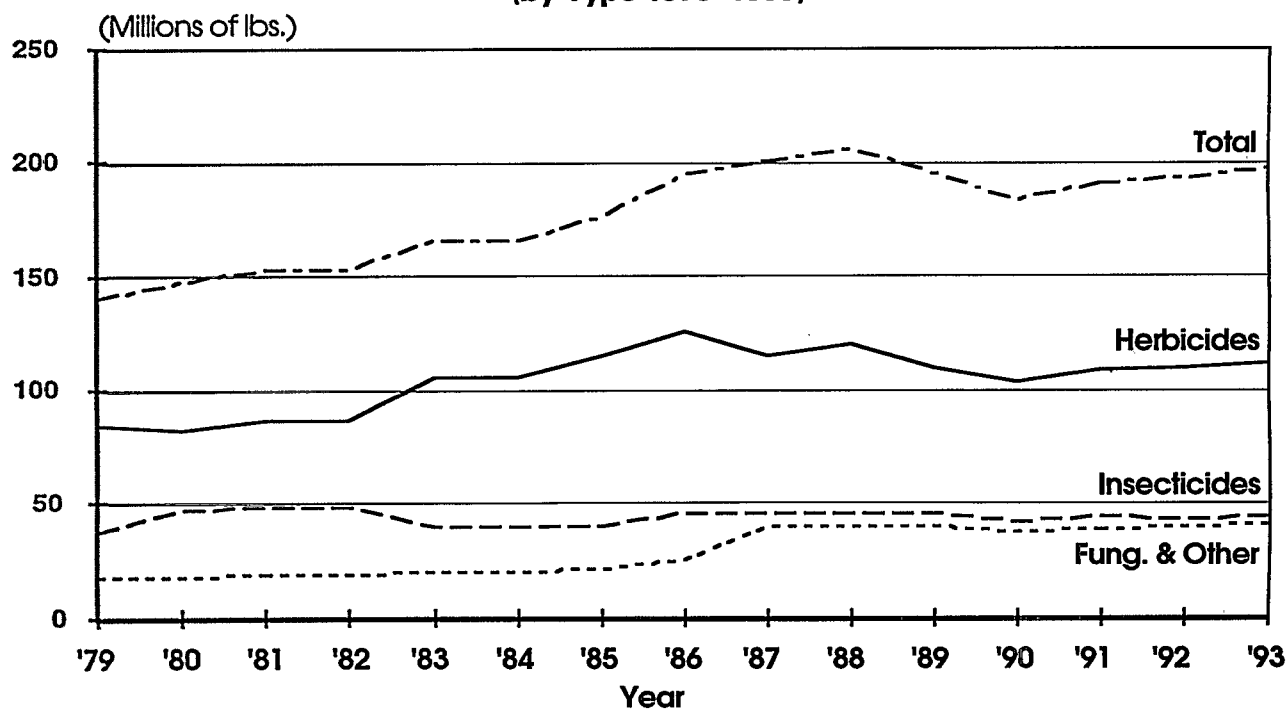


Table 14. (continued)

U.S. Annual Volume of Pesticide Usage, by Sector and Type, 1979-1993.

HOME AND GARDEN

Pesticide	Year														
	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
	Millions of lbs. a.i.														
Herbicides	28	28	28	28	25	25	30	30	25	30	25	25	25	26	27
Insecticides	38	42	48	48	30	30	35	40	36	38	30	30	30	31	32
Fung. & Other	12	12	12	12	10	10	10	11	12	12	14	14	14	14	14
Total	77	82	85	88	65	65	75	81	73	80	78	69	69	71	73

SOURCE: EPA/OPP/BEAD estimates, Annual publications, 1979-1993

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

(by Type 1979-1993)

