

United States
Department of
Agriculture

National Agricultural Statistics Service



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Agricultural Chemical Usage 1997 Livestock and General Farm Summary

April 1999



1997 Agricultural Chemical Use Estimates for Livestock and General Farm Use

Overview: The agricultural chemical use estimates in this report are based on data compiled from a survey conducted in the Fall of 1997. All results refer to the on-farm use of pesticides during the 1997 calendar year. Fertilizer use was not included.

This report provides pesticide use information on segments of agriculture not previously collected by National Agricultural Statistics Service (NASS). Prior to 1997, the NASS pesticide use program focused on crop-specific items such as corn, soybeans, apples, lettuce, etc. The data in this report, along with the crop-specific pesticide use data, will enable a more comprehensive look at the total amounts of pesticides used in the United States.

Pesticides in this report are defined as herbicides, insecticides, fungicides, and other chemicals. Pesticides are regulated by the Environmental Protection Agency (EPA) and have an EPA number on the container of the product.

A pharmaceutical is classified as a drug and is regulated by the Federal Drug Administration (FDA). Pharmaceuticals generally target internal livestock pests such as viruses, bacteria, worms and grubs. This report excludes pharmaceutical products that treat livestock for only internal pests. Some products can be classified as either a pesticide or a pharmaceutical because they can treat both external and internal pests. Examples of dual purpose products are Doramectin, Eprinomectin, and Ivermectin. These products can be applied to livestock internally as an injectable or oral, or externally as a pour-on.

Livestock species targeted in this survey included cattle, hogs, sheep, equine, and goats. The use of pesticides on goats was collected only in Texas. Equine includes horses, ponies, mules, burros, and donkeys. Domesticated species such as buffalo, emus, ostrich, lamas, etc. were not targeted.

Livestock inventories by state, region, and U.S. are reprinted in this report from previous NASS releases. This table is included for informational purposes only. The data in this report cannot be used to calculate rates since the number of animal treatments was not within the scope of the survey.

General farm use included buildings and structures, roads, ditches, grain storage facilities, farmstead, and other non-cropland areas. Other non-cropland areas include drainage ditches, irrigation canals, riding areas, feedlots, fence rows, etc. Excluded were pesticide applications to cropland and to residential sites such as home, lawn, and garden.

The pesticide use data that was collected on rangeland and pastureland for the 1997 calendar year will be published on May 19, 1999 in the report "Agricultural Chemical Usage - 1998 Field Crops Summary."

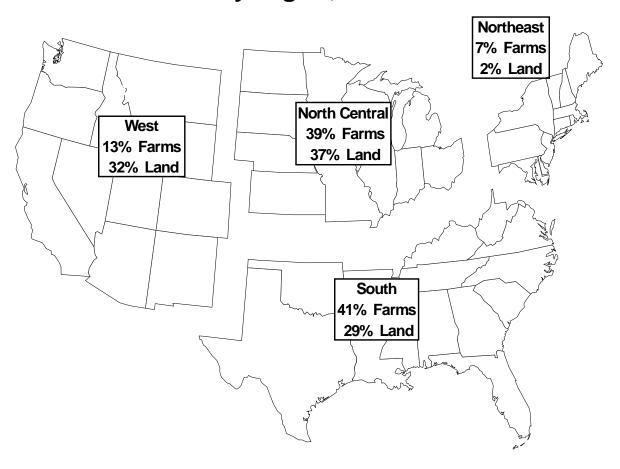
Sample sizes were adequate to publish data only by region and U.S. level. Although data for pesticide usage on poultry was collected during the survey, it was not published due to too few responses.

Reports with Pesticides Summarized by Region and U.S., 1997

Treatment	: _]	Region				
Site	:	North-	:	North	:		:		:	United
	:	East	:	Central	:	South	:	West	:	States
	 :									
	:									
All Livestock	:	140		1,896		2,065		996		5,097
Beef Cattle	:	40		1,524		1,928		903		4,395
Dairy Cattle	:	83		261		73		38		455
Other Livestock	:	21		211		147		93		472
Hogs	:	3		147		24		10		184
Sheep	:	2		26		35		39		102
Equine	:	16		40		74		45		175
Goats*	:					32				32
Poultry	:	2		4		10		5		21
	:									
General Farm Use	:	154		1,440		1,124		1,078		3,796
Grain Storage Facilit	y:	23		323		171		74		591
Buildings	:									
and Structures	:	82		734		478		329		1,623
Roads, Ditches and	:									
Misc. General Farm	:									
Use	:	53		647		617		824		2,141

^{*} Pesticide data for goats was collected in Texas only.

Distribution of Farms and Land in Farms by Region, 1997



Regions:

Northeast CT, DE, ME, MD, MA, NH, NJ, NY, PA, RI, VT

North Central IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, SD, WI

South AL, AR, FL, GA, KY, LA, MS, NC, OK, SC, TN, TX, VA, WV

West AZ, CA, CO, ID, MT, NV, NM, OR, UT, WA, WY

Alaska and Hawaii were not included in the survey.

Highlights

The most commonly used active ingredients on beef cattle in the U.S. were xylene, at 950.9 thousand pounds, and famphur, at 271.7 thousand pounds. Both xylene and famphur are found in Warbex, which is used to control lice, grubs, and flies.

Dichlorvos, which is used to control flies, grubs, and lice, was the most commonly used active ingredient on dairy cattle at 85.4 thousand pounds.

Butoxypolypropylene glycol was the most commonly used insecticide on other livestock (hogs, sheep, equine and goats), at 31.1 thousand pounds. This is used to control flies.

Some active ingredients, such as xylene, piperonyl butoxide, petroleum distillate, and bicycloheptene, are primarily carriers, diluents, synergists, or repellents. These are classified by the EPA as pesticides and are included in this report.

General Farm Use: Almost 6.0 million pounds of herbicides, 1.7 million pounds of insecticide, and 177 thousand pounds of fungicide were applied to or around buildings and structures, grain storage facilities, roads and ditches, and miscellaneous areas on U.S. farms. Excluded are applications to home, lawn, garden, pasture or rangeland, and cropland. The most heavily used herbicide was glyphosate at 2.8 million pounds, while sulfur was the most heavily used insecticide at 658.9 thousand pounds.

Livestock Inventories: Total Number of Head, by State and Region, 1997

			 	,		
State	:		 			
Region				:	Hogs 3/	All Equine 4/
	:		 1,0	000 H∈		
CT DE	:	71 27	5.0		4.5 30	25 10
ME MD	:	114 270	10.0 23.0		6.0 85	16 45
MA	:	64	10.0		18.5	35 7
NH NJ	:	45 60	6.5 14.0		4.4 23.0	45
NY PA	:	1,480 1,720	60.0 94.0		79 1,100	157 165 2
RI VT	:	6 305	16.4		2.8 2.9	19
Northeast:	:	4,162	238.9		1,356.1	526
IL	:	1,550	79.0		4,700	99
IN IA	:	1,120 3,900	56.0 285.0		3,950 14,600	140 99
KS MI	:	6,600 1,100	150.0 85.0		1,530 1,030	104 130
MN MO	:	2,650 4,550	180.0 75.0		5,700 3,550	155 140
NE ND	:	6,650 1,940	95.0 135.0		3,500 200	74 40
OH SD	:	1,350 3,850	140.0 460.0		1,700 1,400	155 74
WI	:	3,600	78.0		740	115
North Central:		38,860	1,818.0		42,600	1,325

See footnotes at end of table.

Livestock Inventories: Total Number of Head, by State and Region, 1997

State	:	Number	of Head	
	:: All Cattle 1/		: Hogs 3/	: All Equine 4/
	:	1,00		
7. Т	: 1,600	0 0	100	120
AL	· · · · · · · · · · · · · · · · · · ·	9.0	190	130
	: 1,900		860	68
	: 1,970		55	170
GA	: 1,390	22.0	520	69
KY	: 2,600	22.0	570	150
LA	930	9.5	32	65
MS	: 1,260	1.4.5	220	74
NC	: 1,100	14.5	9,600	138
OK	5,400	75.0	1,650	165
SC	: 510		305	64
TN	: 2,350	14.5	340	185
TX	: 14,300	1,400.0	580	595
VA	: 1,780	75.0	400	145
WV	: 450	50.0	16.0	43
South:	: 37,540	1,669.5	15,338	2,061
	:			
AZ	: 810	150.0	145	135
CA	: 4,900	880.0	210	235
CO	: 3,250	575.0	790	140
ID	: 1,820	285.0	30	145
MT	: 2,700	432.0	180	130
NV	: 520	91.0	7.5	70
NM	: 1,600	300.0	6.0	64
OR	: 1,580	319.0	35	120
UT	: 930	440.0	295	74
WA	: 1,220	54.0	39	155
WY	: 1,580	720.0	95	61
West:	: 20,910	4,246.0	1,832.5	1,329
US 5/	: 101,472	7,972.4	61,126.6	5,241

^{1/} January 1, 1997.
2/ Sheep and lambs, January 1, 1997.
3/ Hogs and pigs, December 1, 1997.
4/ January 1, 1998. Includes horses, ponies, mules, burros, and donkeys.
5/ Excludes AK and HI for all cattle, hogs and pigs, and equine. For sheep, excludes AK, AR, DE, FL, GA, HI, MS, RI, and SC.

All Livestock: Pesticide Use by Region, 1997 1/ Total Amount Applied

Region	:	Insecticide	:	Fungicide : Other Chemical
	:			1,000 Lbs
Northeast	:	37.8		
North Central	:	1,215.8		*
South	:	473.7		
West	:	570.4		
	:			
United States	:	2,297.6		*

^{*} Insufficient reports to publish data.

^{1/} All livestock includes beef cattle, dairy cattle, hogs, sheep, equine, and goats (goats in Texas only).

All Livestock: Agricultural Chemical Applications, 1/ Total Applied, 1997

	10tai .	Applied, 19			
Agricultural	: :		Region		
	: North- : : East :	North : Central :		: West :	United States
	 : :		1,000 Lbs		
Insecticides:	: : *	7.0	0.0	*	10 1
Amitraz Bicycloheptene	. 0.5	7.2 3.9	2.2 0.2	0.5	10.1 5.2
Bomyl	:	*	*		*
Butoxypolypr. glycol	5.3	5.7	37.0 35.5	19.8	67.8
Carbaryl Chlorpyrifos	·	1.6 14.9	7.6	2.3	38.1 24.8
Coumaphos	: 0.9	13.8	38.9	6.2	59.8
Crotoxyphos	: · *	*	*	0 1	0.7
Cyfluthrin Cypermethrin	: * :	0.4	*	0.1	0.6
Cyromazine	:	*	*		*
Diazinon	: *	5.5	*	6.0	14.6
Dichlorvos Diflubenzuron	5.3	109.6	6.7	5.5	127.1
Dimethoate	*	2.5	*	*	4.8
Dioxathion	:	*	2.3	*	5.8
Dipropyl isocinchom. Doramectin	: •	0.4	*	*	0.4 0.5
Eprinomectin	*	0.8	*	0.8	1.6
Ethion	:	*	*	404.0	0.3
Famphur Fenthion	: : 0.3	167.2 27.5	4.1 13.6	101.8 10.6	273.2 52.0
Fenvalerate	: 0.2	3.3	1.6	1.8	7.0
Flucythrinate	: *	0.6	1.1	*	1.9
Ivermectin Lambda-cyhalothrin	0.2	6.7 0.4	7.6	1.4	15.9 0.6
Lindane	:	*	9.3	*	11.4
Malathion	: 0.5	27.5	49.2	4.3	81.5
Methoprene Methoxychlor	: * : 2.5	* 33.2	* 17.5	* 0.8	4.2 53.9
Naled	:	11.3	*	*	23.1
Permethrin	6.3	23.2	23.2	10.0	62.7
Petroleum distillate Phosmet	: * :	78.7 10.7	140.9	*	$237.4 \\ 12.1$
Piperonyl butoxide	7.8	21.8	18.0	3.2	50.8
Pirimiphos-methyl	: *	2.0	1.6	*	4.3
Pyrethrins Pyridaben	1.2	4.6	3.6	0.6	10.1
Pyriproxyfen	:		*		*
Sulfur	:	*	*	*	*
Tefluthrin Tetrachlorvinphos	*	15.6	17.5	*	40.3
Toxaphene	:	13.0	*		*
Trichlorfon	: *	1.9	*	4.9	10.5
Trimethacarb Xylene	• •	585.4	14.4	356.3	956.1
Zeta-cypermethrin	:	0.1		330.3	0.1
Total Insecticides	37.8	1,215.8	473.7	570.4	2,297.6
Other Chemicals:	: :				
Sodium hypochlorite	:	*			*
Total Other Chemicals	• •	*			*

^{*} Insufficient reports to publish data.

^{1/} All livestock includes beef cattle, dairy cattle, hogs, sheep, equine, and goats (goats in Texas only).

Other Livestock: Pesticide Use by Region, 1997 1/ Total Amount Applied

Region	:	Insecticide	:	Fungicide : Other Chemical
	:			- 1,000 Lbs
Northeast	:	13.0		
North Central	:	47.9		*
South	:	70.0		
West	:	32.4		
	:			
United States	:	163.3		*

^{*} Insufficient reports to publish data for one or more of the pesticide classes.

^{1/} Other livestock includes hogs, sheep, equine, and goats (goats in Texas only).

Other Livestock: Agricultural Chemical Applications, 1/ Total Applied, 1997

		Appiled, 199	· 		
Agri gultumal	: :		Region		
1191104104141	=	North :	:	:	United
	: East :	Central :	South :		States
	 :	 1 ––	 1,000 Lbs		
	:		_,		
Insecticides:	:				
Amitraz	:	*	*		7.3
Bicycloheptene	: *	0.5	0.1	*	0.8
Bomyl	:		*		*
Butoxypolypr. glycol	: 5.1	5.7	0.7	19.7	31.1
Carbaryl	:	*	*		26.5
Chlorpyrifos	:		*	*	*
Coumaphos	:	*	*	*	1.4
Cyromazine	:	*	*		*
Diazinon	:	*	*		*
Dichlorvos	:	7.0	*	*	9.0
Dimethoate	:	*	*	*	*
Dioxathion	:			*	*
Dipropyl isocinchom.	:	*	*	*	0.2
Doramectin	:	*			*
Eprinomectin	:			*	*
Famphur	•	*		*	*
Fenthion	•	*	*	1.1	1.3
Fenvalerate	• *	*		*	3.0
Flucythrinate	•	*			3.0
Ivermectin	• *	1.3	2.1	*	3.4
Lindane	•	*	∠.⊥		J. I
Malathion	• *	*	26.4	*	27.0
	•		∠0.4 *		∠/.U *
Methoprene	•	*		*	*
Methoxychlor Naled	•	*	*		3.0
Naied Permethrin	. 1 6			2 2	
	: 1.6	1.0	3.5	3.2	9.2
Petroleum distillate	. ^	*	*		9.6
Phosmet				2 7	6.8
Piperonyl butoxide	: 4.2	1.5	2.3	2.7	10.6
Pirimiphos-methyl	:	0 0	0 4		
Pyrethrins	: 0.8	0.3	0.4	0.6	2.1
Sulfur	•				
Tetrachlorvinphos	:	*		*	*
Xylene	:	*		*	*
Total Insecticides	: : 13.0	47.9	70.0	32.4	163.3
	:				
Other Chemicals:	:				
Sodium hypochlorite	:	*			*
Total Other Chemicals	:	*			*
TOTAL OTHER CHEMICALS	· 				

^{*} Insufficient reports to publish data.

^{1/} Other livestock includes hogs, sheep, equine, and goats (goats in Texas only).

Beef Cattle: Pesticide Use by Region, 1997 Total Amount Applied

Region	:	Insecticide	:	Fungicide : Other Chemical
Northeast	:	4.9		1,000 Lbs
North Central South West	: : : : :	1,004.7 349.0 519.9		
United States	: :	1,878.5		

Beef Cattle: Agricultural Chemical Applications, Total Applied, 1997

	: Region :										
Agricultural Chemical	:	Now+b ·		·							
CHemicai	: North- : East :	Central :	South :	West :	States						
	:	:	1,000 Lbs	-							
Insecticides:	· :										
Amitraz	:		*	*	2.1						
Bicycloheptene	: *	*	0.1		0.3						
Bomyl	:	*			*						
Butoxypolypr. glycol	:		*	*	*						
Carbaryl	: *	1.5	8.4	*	10.9						
Chlorpyrifos	:	14.7	7.5	2.3	24.4						
Coumaphos	: *	11.4	37.9	*	53.3						
Crotoxyphos	:	0.7			0.7						
Cyfluthrin	:	0.3	*	*	0.4						
Cypermethrin	•	*	*		*						
Cyromazine	:		0 4	2 5							
Diazinon	:	2.6	2.4	3.5	8.5						
Dichlorvos	•	26.5	5.1	1.2	32.7						
Diflubenzuron	. *	*	*	*							
Dimethoate Dioxathion	•	*	*	r	1.8 4.5						
Dipropyl isocinchom.	•		*		4.5						
Doramectin	•	0.4	*	*	0.5						
Eprinomectin	•	0.4	0.1	0.8	1.4						
Ethion	•	*	*	0.0	0.3						
Famphur	:	165.9	4.0	101.8	271.7						
Fenthion	: 0.2	24.0	13.6	9.5	47.3						
Fenvalerate	:	1.7	1.6	0.4	3.7						
Flucythrinate	: *	0.6	1.1	*	1.8						
Ivermectin	: 0.2	3.6	5.3	1.4	10.5						
Lambda-cyhalothrin	: *	0.4	*	*	0.6						
Lindane	:	*	8.0	*	8.6						
Malathion	:	22.4	22.7	4.2	49.3						
Methoprene	: *	*	*	*	4.2						
Methoxychlor	: *	25.8	15.8	*	42.3						
Naled	:	*	*	*	7.9						
Permethrin	: 0.1	14.4	16.3	5.2	36.0						
Petroleum distillate	: *	67.5	130.4	*	214.7						
Phosmet	:	*	*	*	5.3						
Piperonyl butoxide	: * · *	2.5	14.9	*	18.1						
Pirimiphos-methyl	· *	1.7	1.5	*	3.9						
Pyrethrins	• •	^	2.9	^	3.0						
Pyridaben	•		*		*						
Pyriproxyfen Sulfur	•		*	*	*						
Tetrachlorvinphos	•	13.7	17.4	7.1	38.2						
Toxaphene	:	13.7	1/. 1	/	30.2						
Trichlorfon	:	1.7	1.5	4.9	8.1						
Trimethacarb	:	*	1.5	1.7	*						
Xylene	:	580.6	14.1	356.2	950.9						
Zeta-cypermethrin	:	0.1		220.2	0.1						
	:			=4.5.5							
Total Insecticides	: 4.9	1,004.7	349.0	519.9	1,878.5						

^{*} Insufficient reports to publish data.

Dairy Cattle: Pesticide Use by Region, 1997 Total Amount Applied

Region	:	Insecticide	:	Fungicide : Other Chemical
	: :			- 1,000 Lbs
Northeast	:	19.8		
North Central	:	163.2		
South	:	54.7		
West	:	18.1		
	:			
United States	:	255.7		

Dairy Cattle: Agricultural Chemical Applications, Total Applied, 1997

	: Region :									
01101112 0012	: : North- : : East :	North :			United States					
	 :		1,000 Lbs							
Insecticides:	:									
Amitraz	: *	*			*					
Bicycloheptene	: *	3.3	*	*	4.0					
Butoxypolypr. glycol	: *		*		*					
Carbaryl	: *	*	0.6	*	0.6					
Chlorpyrifos	:	*			*					
Coumaphos	: 0.2	1.2	0.9	2.7	5.0					
Crotoxyphos	:		*		*					
Cyfluthrin	: *	*	*	*	0.2					
Cypermethrin	:	*			*					
Cyromazine	:	*			*					
Diazinon	: *	0.6	*	2.5	3.1					
Dichlorvos	5.3	76.1	*	*	85.4					
Diflubenzuron	:	*			*					
Dimethoate	•	*			*					
Dioxathion	:	*			*					
Dipropyl isocinchom.	:	*			*					
Doramectin	:	*	*	*	*					
Eprinomectin	: *	0.3	*	*	0.3					
Famphur	:	1.1	*	*	1.2					
Fenthion	: 0.1	3.3	*	*	3.4					
Fenvalerate	: *	0.2	*	*	0.3					
Flucythrinate	:	*	*		*					
Ivermectin	: *	1.8	0.1	*	2.0					
Lindane	:	*	*		*					
Malathion	: *	4.9	*		5.2					
Methoxychlor	2.4	7.4	1.8		11.5					
Naled	:	*	*	*	*					
Permethrin	: 4.6	7.9	3.4	1.6	17.5					
Petroleum distillate	: *	*	8.7		13.1					
Phosmet	•	*			*					
Piperonyl butoxide	: 3.0	17.9	*	*	22.2					
Pirimiphos-methyl	•	*	*		0.3					
Pyrethrins	: *	4.3	*	*	5.0					
Sulfur	•	*			*					
Tefluthrin	:	*			*					
Tetrachlorvinphos	: *	1.9	*		2.0					
Trichlorfon	: *	*			*					
Xylene	: •	4.0	*	*	4.2					
Total Insecticides	: 19.8	163.2	54.7	18.1	255.7					

^{*} Insufficient reports to publish data.

General Farm Use: Pesticide Use by Region, 1997 Total Amount Applied

Region	:	Herbicide	: Insecticide 1/:	Fungicide	: Other Chemical
	:		1,00	0 Lbs	
Northeast	:	1,410.9	89.2		255.6
North Central	:	1,105.6	291.0	*	136.7
South	:	1,231.9	460.3	*	9.9
West	:	2,251.0	899.5	140.3	1.1
	:				
United States	:	5,999.4	1,740.0	177.3	403.3

^{*} Insufficient reports to publish data.

^{1/} Total applied excludes Bt's (Bacillus thuringiensis). Quantities are not available because amounts of active ingredient are not comparable between products.

General Farm Use: Agricultural Chemical Applications, Total Applied, 1997

	:		Region		
119110dicdidi	:: : North- :	North:	 :	·	United
		Central :		West :	States
	:	:	1,000 Lbs -		
erbicides:	:				
2,4-D	: 19.1	454.2	108.9	499.8	1,082.
2,4-D, Dimet. salt	• 17.1	131.2	100.5	±22.0	1,002
2,4-DB	• *		*		
Acetochlor	· •	11.2			11
Acifluorfen	• *	11.2			
Alachlor	• *			*	60
Ametryn	•	*		*	0
Ammonium benzadox	· •			*	0
Atrazine	: 400.1	61.0	46.9	33.8	541
Barban	. 400.1	*	40.9	33.0	241
Benefin	•		*	*	
Bentazon	• *	*			
Bromacil	•	*	*	3.3	3
Bromoxynil	•	*	*	*	1
Butylate	•			*	т.
Chlorimuron-ethyl	• *	*			1
Chlorsulfuron	•	*		*	Т
Clomazone	• *				
	• *	*		1.8	E
Clopyralid	• *	*	*	⊥.0	5 59
Cyanazine		•	•	*	59
Diallate	• *	74.0	26.2	*	120
Dicamba	. ^	74.0	36.3	*	139
Dichlobenil		*		^	
Dichlorprop		^		*	
Difenzoquat	• *	*		^	
Dimethenamid	*	*	at.		
Dipot. Endothall	:	*	*	60 5	6.5
Diuron	: · *	*	*	60.7	65
EPTC	· *			*	
Ethalfluralin	. *	*	*		2
Fenoxaprop	· *	*	*	*	3
Fluazifop-P-butyl	· *	*	*	*	1
Flumetsulam	*	at.	at.		
Fomesafen	:	*	*		
Glufosinate-ammonium	:	*	004 1	1 050 1	0 500
Glyphosate	: 224.6	361.7	934.1	1,270.1	2,790
Halosulfuron	:	.i.	.i.	*	_
Hexazinone	:	*	*	*	2
Imazamethabenz	:			*	
Imazapyr	:			*	_
Imazapyr, iso. salt	:	*		*	0
Imazaquin	*	*	*		3
Imazethapyr	*	*	*		1
Linuron	: *				

General Farm Use: Agricultural Chemical Applications, Total Applied, 1997 (continued)

	Tot	al App	11e	d, 1997 (d	cont.	1nued)		
	:				R	egion.		
Agricultural Chemical	• 1/	IOT CII-	•	MOLCII	•		: : West	: United : States
	:			_	- 1,	000 Lbs		
Herbicides: (cont.)	•							
MCPA				*		*	*	20.8
MCPB	•			*		-		ZU.0 *
Metolachlor	:		*	*		*		521.1
Metribuzin	:	6.	. 1	*		*	12.6	
Metsulfuron-methyl	:			*		*	0.4	0.7
MSMA	:			*				*
Napropamide	:			*			*	*
Nicosulfuron	:			*			*	0.5
Oryzalin	:		*			*	*	49.1
Oxyfluorfen	:	4.5	_				65.8	
Paraquat	:	41.	. 5	9.7		15.3	39.0	105.5
Pebulate	:		*	*		*		FO 4
Pendimethalin Picloram			•	6.8		2.2	34.6	59.4 43.6
Primisulfuron	•			0.0		۷.۷	34.0	*
Prometon	:		*	6.7		7.6	*	16.9
Prometryn	:			0.7		*		*
Propachlor	:		*	*			*	*
Propanil	:			*		*		*
Propanoic acid	:						*	*
Propazine	:		*					*
Prosulfuron	:			*		*		*
Pyridate	:			*			*	*
Quinclorac	:		.1.	.1.		*	*	*
Sethoxydim	:		*	*		*	21.3	6.6 24.1
Simazine Sodium metaborate	:		•	*			21.3	∠4.⊥
Sulfometuron methyl	·			*				*
Sulfosate	:			*		*		*
Tebuthiuron	:			*		*		0.6
Terbacil	:		*				*	*
Thifensulfuron	:	0.	. 8	*			*	1.1
Thiobencarb	:					*		*
Triasulfuron	:			*		*	*	25.1
Tribenuron-methyl	:		*				*	0.6
Triclopyr	:		*	16.6		39.0	*	59.4
Trifluralin	:		*	*		*	*	41.3
Motol Howbiridos	:	1 410	0	1 105 6		1 001 0	2 251 0	F 000 4
Total Herbicides	:	1,410.	. 9	1,105.6		1,231.9	2,251.0	5,999.4
	•							
Insecticides:	:							
Abamectin	:					*		*
Acephate	:					*	*	21.2
Aldicarb	:					*		*
Amitraz	:		*				*	*
Azinphos-methyl	:					*		*
Bendiocarb	:		*			*		*
Bicycloheptene	:		*			*	*	0.1
Bifenthrin	:		*				*	*

General Farm Use: Agricultural Chemical Applications, Total Applied, 1997 (continued)

	TOCAL APPILE									
Agricultural	:	Region								
Chemical	: North- : East :	North Central	: South	: : : : : : : : : : : : : : : : : : :	United States					
	:		- 1,000 Lbs							
Insecticides: (cont.)	:									
Bomyl	:	*			*					
Bt (Bacillus thur.) 1/		*	*	*	*					
Butoxypolypr. glycol		*		*	*					
Carbaryl	: *	8.1	49.3	*	64.3					
Carbofuran Chlorpyrifos	. *	*	29.6	*	30.9					
Chlorpyrifos-methyl	*	14.7	29.0 *	11.0	26.9					
Coumaphos	:	*	*	11.0	*					
Cyfluthrin	: 40.3	7.8	0.2	6.8	55.1					
Cyromazine	:		*		*					
Diazinon	: *	*	66.1	20.0	91.1					
Dichlorvos	: *	58.8	2.5	*	62.0					
Dicofol	:		*	*	*					
Diflubenzuron Dimethoate	· *	2.0		*						
Endosulfan	•	2.0	*	•	4.0					
Esfenvalerate	· : *	*	*	*	24.2					
Famphur	:		*		*					
Fenoxycarb	:		*		*					
Fenvalerate	:	*	*		*					
Formetanate hydro.	:		*		*					
Hydramethylnon	:		0.3		0.3					
Lambda-cyhalothrin	: *	*		*	7.9					
Lindane	:	06.6	*	16.0	*					
Malathion	: 17.0	86.6	242.9	16.9	363.5 22.1					
Methomyl Methoprene	*		*	•	∠∠.⊥					
Methoxychlor	· : *	3.9	0.9	*	5.1					
Methyl parathion	:	*	*		*					
Mevinphos	:		*		*					
Naled	: *	11.6	*	29.9	53.8					
Permethrin	: 14.9	12.3	8.7	0.9	36.7					
Petroleum distillate	:	48.8	*	*	121.2					
Phosmet	:	4 0	*	at.	*					
Piperonyl butoxide	: * · *	4.8	1.8	*	9.3					
Pirimiphos-methyl Propargite	•		•	*	3.5					
Pyrethrins	*	1.0	*	*	1.4					
Pyriproxyfen	:	1.0	*		*					
Ronnel	: *	*	*	*	*					
Rotenone	:	*		*	*					
Silicon dioxide	:	*	*	*	3.7					
Sulfur	:	*	*	645.1	658.9					
Tebufenozide	:		*		*					
Tefluthrin	: : *	*	*		*					
Tetrachlorvinphos Tetramethrin	. *		*	*	*					
Trichlorfon	:		*	^	*					
Xylene	:		*		*					
/	:									
Total Insecticides	: 89.2	291.0	460.3	899.5	1,740.0					

General Farm Use: Agricultural Chemical Applications, Total Applied, 1997 (continued)

	Total Appli	led, 1997 (cc	ontinuea) 		
7	:		Region		
Agricultural Chemical	: North-	: North : Central	: : South	: West :	States
	 :		1,000 Lbs	 	
The same of the same	:				
Fungicides: Benomyl	• •		*	*	*
Captan	:		*		*
Chlorothalonil	:		*	*	*
Coal tar creosote Copper sulfate	:	*	*	*	*
Cresol	:		*		*
Fenarimol	:		d.	*	*
Mancozeb Metalaxyl	: •		*	*	*
Metiram	:		*		*
Myclobutanil	:		*		*
Streptomycin	:		*		*
Total Fungicides	:	*	*	140.3	177.3
	• •				
Other Chemicals:	:				
4-tert-Amylphenol	: 17.0	*		*	17.2
Alk. dim. benz. Alk. dim. eth. benz.	: *				*
Aluminum phosphide	:	*	0.9	*	1.3
Ammonium soap	:		*		*
Amylphenol	:	*		*	42.2
Benzylchlorophenol Brodifacoum	: 42.6 : *	*	*	*	43.3
Bromadiolone	: *	*		*	*
Bromethalin	: *		*		*
Capric acid Caprylic acid	: 4.2 : 12.6				4.2 12.6
Chlorine dioxide	5.2				5.2
Cholecalciferol	: *				*
Citric acid	: 41.9		*		41.9
Difethialone Diphacinone	: *	*	*		*
Dodecylbenzene	: *				*
Ethephon	: *				*
Orthophenylphenol	: 51.1	*		*	51.8
Phosphoric acid Potassium 4-tert-am.	: 58.1 :		*		58.1
Potassium o-benzyl	:		*		*
Potassium salt	:		*		*
Scilliroside Sodium chlorate	:	*	*		*
Sodium chiorate Sodium hypochlorite	: *		*		155.1
Sodium o-benzyl	:	*			*
Sodium o-phenylphen.	:	*			*
Warfarin Zinc phosphide	: *	*	*	*	*
Time bijophiitae	:				
Total Other Chemicals	: 255.6	136.7	9.9	1.1	403.3

^{*} Insufficient reports to publish data.

1/ Total applied is not available because amounts of active ingredient are not comparable between products and are not included in Total Insecticides.

Grain Storage Facilities: Pesticide Use by Region, 1997 Total Amount Applied

Region	:	Insecticide 1/:	Fungicide : Other Chemical
	:		1,000 Lbs
Northeast	:	14.7	*
North Central	:	99.5	*
South	:	80.0	*
West	:	21.6	*
	:		
United States	:	215.9	1.5

^{*} Insufficient reports to publish data.

^{1/} Total applied excludes Bt's (Bacillus thuringiensis). Quantities are not available because amounts of active ingredient are not comparable between products.

Grain Storage Facilities: Agricultural Chemical Applications, Total Applied, 1997

:			Region		
01102 00.2	North- :	North:	: South :	:	United
:			South:		
:			1,000 Lbs		
:			_,		
Insecticides: :					
Acephate :			*		*
Amitraz :				*	*
Bt (Bacillus thur.) 1/:		*			*
Carbaryl :		*	*		0.5
Chlorpyrifos-methyl :	*	14.6	*	11.0	26.5
Coumaphos :		*			*
Cyfluthrin :		0.5		4.2	4.7
Diazinon :		*			*
Dichlorvos :	*	*			*
Lindane :			*		*
Malathion :	13.7	74.0	70.5	6.2	164.4
Methomyl :		*			*
Methoprene :			*		
Methoxychlor :	*	*	*		5.0
Permethrin :		*	*		*
Petroleum distillate :	*	*	*		*
Piperonyl butoxide :	*	*	*	*	
Pirimiphos-methyl :	*	*	*	*	3.5
Pyrethrins :	^	*	^		*
Ronnel :		*	*	*	
Silicon dioxide : Trichlorfon :		*	*	*	3.7
Trichlorion			•		Ŷ
Total Insecticides :	14.7	99.5	80.0	21.6	215.9
:					
:					
Other Chemicals: :					
Aluminum phosphide :		*	*	*	1.3
Brodifacoum :	*	*	*		*
Bromethalin :	*	*			*
Diphacinone :	*	*			*
Sodium hypochlorite :		*			*
Warfarin :	*	*	*		*
: Total Other Chemicals :	*	*	*	*	1 -
iotal Other Chemicals :	^	^	•	^	1.5

^{*} Insufficient reports to publish data.

^{1/} Total applied is not available because amounts of active ingredient are not comparable between products and are not included in Total Insecticides.

Buildings and Structures: Pesticide Use by Region, 1997 Total Amount Applied

Region	:	Herbicide	: Insecticide 1/:	Fungicide	: Other Chemical
	:		1,000) Lbs	
Northeast	:	44.9	65.0		248.6
North Central	:	306.3	166.5	*	101.5
South	:	208.4	140.7	*	9.0
West	:	200.5	29.5	*	0.8
United States	:	760.1	401.7	18.5	359.8

^{*} Insufficient reports to publish data.

^{1/} Total applied excludes Bt's (Bacillus thuringiensis). Quantities are not available because amounts of active ingredient are not comparable between products.

Buildings and Structures: Agricultural Chemical Applications, Total Applied, 1997

	:						
Agricultural Chemical		:	North	:		: :	United
	:			 - 1	,000 Lbs ·	 	
	:						
Herbicides:	:						
2,4-D	•		96.2		12.8	75.3	184.2
Acetochlor	:		*				*
Alachlor	:	*	*				*
Ametryn	:		*			*	*
Ammonium benzadox	:	*	4 0		*	*	
Atrazine	•	*	4.9		*	*	7.5
Barban	•		*		*	*	
Bromacil	:		*		*	*	0.6
Bromoxynil	•					*	*
Chlorsulfuron	:		*			*	
Clopyralid	:						0.1
Dicamba	:		*		*	14.8	18.2
Dichlobenil	:		at.			*	*
Dichlorprop	:		*				
Diuron	:		*		*	1.0	1.6
Fenoxaprop	:				*		*
Fluazifop-P-butyl	:	_	100 =		104.0	*	*
Glyphosate	: 41	. 7	192.7		184.0	67.6	486.1
Hexazinone	•				*		*
Imazethapyr	•		*				*
MCPA	:				*	*	*
MCPB	:		*				*
Metribuzin	•		*		*	*	2.4
Metsulfuron-methyl	:					*	*
MSMA	•		*				*
Oryzalin	:					*	
Oxyfluorfen	•					2.2	2.2
Paraquat	•	*	*		*	*	0.9
Picloram	•		*		*	30.4	30.8
Prometon	•	*	4.7		3.3	*	10.6
Prometryn	•				*		*
Propanil	:		*				*
Pyridate	:		*				*
Sethoxydim	•		*				*
Simazine	•					*	*
Sodium metaborate	•		*				*
Sulfosate	•				*		*
Tebuthiuron	•		*				*
Terbacil	:					*	*
Thifensulfuron	:		_			*	*
Triasulfuron	:		*			*	*
Tribenuron-methyl	:		_			*	*
Triclopyr	: •		1.9		0.5	0.3	2.6
Total Herbicides	: 44	. 9	306.3		208.4	200.5	760.1

Buildings and Structures: Agricultural Chemical Applications, Total Applied, 1997 (continued)

:			Region		
Agricultural Chemical	North- :	North	:	: West :	United
:			1,000 Lbs		
Insecticides: :					
Acephate :			*	*	13.4
Amitraz :	*				*
Bendiocarb :	*				*
Bicycloheptene :	*		*		*
Bomyl :		*			*
Bt (Bacillus thur.) 1/:			*		*
Butoxypolypr. glycol :		*			*
Carbaryl :		*	25.7	*	35.9
Chlorpyrifos :		*	*		6.8
Chlorpyrifos-methyl :		*			*
Coumaphos :		*	*		*
Cyfluthrin :	40.3	7.2	0.2	2.6	50.4
Cyromazine :			*		*
Diazinon :	*	*	46.1	*	57.3
Dichlorvos :	*	58.8	2.5	*	62.0
Dimethoate :	*	*		*	2.4
Esfenvalerate :		*			*
Fenoxycarb :			*		*
Fenvalerate :		*	*		*
Hydramethylnon :			0.1		0.1
Lambda-cyhalothrin :	*	*		*	*
Malathion :	2.7	11.4	17.3	10.4	41.7
Methomyl :	*	*	*	*	*
Methoprene :	*		*		*
Methoxychlor :			*		*
Mevinphos :			*		*
Naled :	*	11.6	10.3	*	25.8
Permethrin :	9.1	4.7	*	*	14.4
Petroleum distillate :		*	*	*	59.7
Phosmet :			*		*
Piperonyl butoxide :	*	*	*	*	7.4
Pyrethrins :	*	*	*		1.0
Pyriproxyfen :			*		*
Ronnel :	*	*	*	*	*
Tebufenozide :			*		*
Tetrachlorvinphos :	*		*		*
Tetramethrin :				*	*
: Total Insecticides :	65.0	166.5	140.7	29.5	401.7

Buildings and Structures: Agricultural Chemical Applications, Total Applied, 1997 (continued)

:	: Region								
Agricultural :									
		North :							
:	East :	Central :	South :	West :	States				
:		 1	,000 Lbs						
:		_	,000 LDD						
Fungicides: :									
Benomyl :				*	*				
Chlorothalonil :				*	*				
Coal tar creosote :			*		*				
Copper sulfate :		*	*		*				
Cresol :			*		*				
Mancozeb			^	*	*				
Metalaxyl :				•	r				
Total Eurojaidaa		*	*	*	18.5				
Total Fungicides :					10.5				
•									
Other Chemicals:									
4-tert-Amylphenol :	*	*		*	17.2				
Alk. dim. benz.	*	*			*				
Alk. dim. eth. benz.	*				*				
Ammonium soap :			*		*				
Benzylchlorophenol:	42.6	*		*	43.3				
Brodifacoum :	*	*	*	*	*				
Bromadiolone :	*	*		*	*				
Bromethalin :	*	*	*		*				
Capric acid :	4.2				4.2				
Caprylic acid :	12.6				12.6				
Chlorine dioxide :	5.2				5.2				
Cholecalciferol :	*				*				
Citric acid :	41.9				41.9				
Difethialone :			*		*				
Diphacinone :	*	*	*		*				
Dodecylbenzene :	*				*				
Orthophenylphenol :	51.1	*		*	51.8				
Phosphoric acid :	58.1				58.1				
Potassium 4-tert-am.			*		*				
Potassium o-benzyl :			*		*				
Potassium salt :			*		*				
Scilliroside :		J.	*		*				
Sodium chlorate :	al-	*	*		*				
Sodium hypochlorite :	*	100.1	*		113.1				
Warfarin	*	*	*	*	*				
Zinc phosphide				^	*				
Total Other Chemicals	248.6	101.5	9.0	0.8	359.8				

^{*} Insufficient reports to publish data.

^{1/} Total applied is not available because amounts of active ingredient are not comparable between products and are not included in Total Insecticides.

Roads, Ditches and Miscellaneous General Farm Use Pesticide Use by Region, 1997 Total Amount Applied

Region	:	Herbicide	: Insecticide 1/:	Fungicide	: Other Chemical
	:		1,00)0 Lbs	
Northeast	:	1,366.0	9.5		*
North Central South	:	799.3 1,023.5	25.0 239.6		35.0 *
West	:	2,050.5	848.4		*
United States	:	5,239.4	1,122.5		42.0

^{*} Insufficient reports to publish data.

^{1/} Total applied excludes Bt's (Bacillus thuringiensis). Quantities are not available because amounts of active ingredient are not comparable between products.

Roads, Ditches and Miscellaneous General Farm Use Agricultural Chemical Applications Total Applied, 1997

	Total	Appliea, I	99	/		
Agrigulturo l	 : :			Region		
1191104104141	: North- :	North		South		United States
	 •		 - 1	,000 Lbs -		
				,000 LDS		
Herbicides:	:					
2,4-D	: 19.1	358.1		96.1	424.5	897.8
2,4-D, Dimet. salt	:				*	*
2,4-DB	*			*		*
Acetochlor	:	*				*
Acifluorfen	: * · *					*
Alachlor	*	*			*	*
Ametryn	. 400 0			11 6		
Atrazine Benefin	400.0	56.1		44.6	33.7	534.4
Bentazon	· *	*				*
Bromacil				*	*	3.0
Bromoxynil		*		*	*	*
Butylate	•				*	*
Chlorimuron-ethyl	*	*				1.2
Chlorsulfuron	:	*			*	*
Clomazone	*					*
Clopyralid	2.2	1.2			1.7	5.1
Cyanazine	*	*		*	*	59.1
Diallate	:				*	*
Dicamba	•	72.3		34.5	12.6	119.4
Dicamba, Pot. salt	*					*
Dichlobenil					*	*
Difenzoquat		a.			*	*
Dimethenamid	*	*		*		*
Dipot. Endothall		*		*	FO 7	64.3
Diuron EPTC	· *	r		•	59.7 *	04.3
Ethalfluralin	*					*
Fenoxaprop	*	*		*		3.6
Fluazifop-P-butyl	*	*		*	*	1.3
Flumetsulam	*					*
Fomesafen	:	*		*		*
Glufosinate-ammonium	:	*				*
Glyphosate	182.9	169.0		750.0	1,202.5	2,304.4
Halosulfuron	:				*	*
Hexazinone	:	*		*	*	*
Imazamethabenz	•				*	*
Imazapyr	:				*	*
Imazapyr, iso. salt	:	*			*	0.3
Imazaquin	*	*		*		3.3
Imazethapyr	: * · *	*		*		*
Linuron	. *	*		*	F 0	* 10 0
MCPA Metolachlor	516.9	*		*	5.0	19.0 521.1
Metribuzin	6.1	*		*	11.7	18.6
Metribuzin Metsulfuron-methyl	. 0.1	*		*	0.4	0.7
Napropamide	.	*			*	*
		*			*	0.5
						0.5

Roads, Ditches and Miscellaneous General Farm Use Agricultural Chemical Applications Total Applied, 1997 (continued)

	Applic				
7	: :		Region		
Agricultural Chemical	North- : East :	North : Central :	: : South	: : :	United States
	 :		1,000 Lbs -		
Herbicides: (cont.)	:				
Oryzalin	*		*	*	*
Oxyfluorfen	:			63.6	63.6
raraqaac	41.2	*	*	38.9	104.6
Pendimethalin	*	*	*		59.4
Picloram	•	6.7	1.9	4.2	12.7
Primisulfuron	•			*	*
Prometon	: · *	*	*	*	6.3
Propachlor Propanil	·	*	*	•	*
Propanoic acid	:			*	*
Propazine	: *				*
Prosulfuron	:	*	*	*	*
Pyridate Quinclorac	: •	*	*	*	*
Sethoxydim	*	*	*	*	6.4
Simazine	: *	*		*	23.7
Sulfometuron methyl	:	*			*
Sulfosate Tebuthiuron	: •	*	*		*
Terbacil	*				*
Thifensulfuron	0.8	*		*	1.1
Thiobencarb	:		*		*
Triasulfuron	: · *	*	*	*	25.1 0.5
Tribenuron-methyl	*	14.7	38.5	*	56.8
Triclopyr Trifluralin	*	*	*	15.2	41.3
Total Herbicides	: : 1,366.0	799.3	1,023.5	2,050.5	5,239.4
iotai lielbielaeb	:	,,,,,	1,023.3	2,030.3	5,255.1
Insecticides:	• :				
Abamectin	:		*	*	*
Acephate Aldicarb	.		6.0	*	7.7
Azinphos-methyl	•		*		*
Bendiocarb	:		*		*
Bicycloheptene Bifenthrin	: · *		*	*	*
Bifenthrin Bt (Bacillus thur.) 1/	•	*		*	*
Butoxypolypr alveol	• •			*	*
Butoxypolypr. glycol Carbaryl	*	*	23.3	2.3	27.9
Carbofuran	: *				*
Chlorpyrifos	: · *	*	23.2	*	24.1
Chlorpyrifos-methyl Coumaphos	·	^	*		*
Cyfluthrin	.	*			*

Roads, Ditches and Miscellaneous General Farm Use Agricultural Chemical Applications Total Applied, 1997 (continued)

7]	: Region								
Agricultural Chemical	: North-	: : North :	·:	:	United				
011011111111111111111111111111111111111	: East	: Central :	South :	West :	States				
	:		1,000 Lbs -	 -					
	:		·						
Insecticides: (cont.)	:								
Diazinon	:	*	20.0	11.2	31.6				
Dichlorvos	: *				*				
Dicofol	:		*		*				
Diflubenzuron	:			*	*				
Dimethoate	:			*	*				
Endosulfan	:		*		*				
Esfenvalerate	: *		*	*	*				
Famphur	:		*		*				
Fenoxycarb	:		*		*				
Formetanate hydro.	:		*		*				
Hydramethylnon	:		0.2		0.2				
Lambda-cyhalothrin	: *		0.2		*				
Malathion	: *	1.2	155.2	*	157.4				
Methomyl	•	1.2	133.2	*	*				
Methoxychlor	•			*	*				
Methyl parathion		*	*		*				
Naled			*	*	28.0				
Permethrin	. *	7.5	3.6	*	17.6				
Petroleum distillate	•	7.5	3.0	*	61.2				
	•		*	*	1.8				
Piperonyl butoxide	•			*	⊥.0				
Propargite	•		*	*					
Pyrethrins	. *		^	^	0.4				
Ronnel	* .	*		*	*				
Rotenone	•	*	di.						
Sulfur	:		*	645.1	658.9				
Tefluthrin	:	*			*				
Xylene	:		*		*				
Total Insecticides	: 9.5 :	25.0	239.6	848.4	1,122.5				
	:								
Fungicides:	:								
Benomyl	:		*		*				
Captan	:		*		*				
Chlorothalonil	:		*		*				
Copper sulfate	:	*		*	*				
Fenarimol	:			*	*				
Metiram	:		*		*				
Myclobutanil	:		*		*				
Streptomycin	:		*		*				
Total Fungicides	: :	*	22.5	*	158.8				

Roads, Ditches and Miscellaneous General Farm Use Agricultural Chemical Applications Total Applied, 1997 (continued)

Agricultural	:					Region				
Chemical	:	North- East	:	North Central	: :	South	:	West	:	United States
	:				- 1	,000 Lbs				
	:									
Other Chemicals:	:									
Amylphenol	:			*						*
Brodifacoum	:					*				*
Bromadiolone	:			*						*
Chlorine dioxide	:		*							*
Ethephon	:		*							*
Sodium hypochlorite	:		*	34.8		*				41.7
Sodium o-benzyl	:			*						*
Sodium o-phenylphen.	:			*						*
Warfarin	:			*						*
Zinc phosphide	:								*	*
	:									
Total Other Chemicals	:		*	35.0		*			*	42.0

^{*} Insufficient reports to publish data.

^{1/} Total applied is not available because amounts of active ingredient are not comparable between products and are not included in Total Insecticides.

Survey Procedures: The estimates in this report are based on the Fall Agricultural Survey conducted in December, 1997. This survey is based on a sample of 7,169 segments or parcels of land which average approximately 1 square mile. Enumerators conducting the area survey contacted all farmers having operations within the sampled segments and collected a variety of information, including pesticide applications for their entire operation. Estimates are then calculated, using the selection probability of each segment of land.

Estimation Procedures: The chemical applications data, reported by product name or trade name, are reviewed within region and across regions for reasonableness and consistency. This review compares reported data with manufacturer's recommendations and with data from other farm operators using the same product. Following this review, product information are converted to an active ingredient level. The chemical usage estimates in this publication consist of survey estimates of those active ingredients.

These data will not be revised even if there are subsequent revisions to livestock inventories.

Detailed data within a table may not sum by regions to U.S. totals and may not sum to class totals due to independent rounding of published values.

Reliability: The survey was designed so that the estimates are statistically representative of chemical use in the surveyed states. The reliability of these survey results is affected by sampling variability and non-sampling errors.

The results of this survey are subject to sampling variability. Sampling variability is a measure of how the estimates would differ if other samples had been drawn. The sampling variability expressed as a percent of the estimate is called the coefficient of variation (cv). Sampling variability of the estimates differed considerably by chemical and site of application. In general, the more often the chemical was applied, the smaller the sampling variability. For example, estimates of use of a commonly used product, such as glyphosate for general farm purposes other than cropland, will exhibit less variability than a more rarely used product. For more commonly used chemicals, cv's will range from 5-30 percent at the U.S. level and 5-75 percent at the Regional level. Some rarer items could have cv's above 100 percent. These items have insufficient data for publication and these instances are noted with an asterisk (*).

Non-sampling errors occur during a survey process, and unlike sampling variability, are difficult to measure. They may be caused by interviewers failing to follow instructions, poorly worded questions, non-response, problematic survey procedures, or data handling mistakes between collection and publication. In this survey, all survey procedures and analyses were carried out in a consistent and orderly manner to minimize the occurrence of these types of errors.

Terms and Definitions

Active ingredient: The active ingredient is the specific chemical which kills or controls the target pests. Usage data are reported by pesticide product and are converted to an amount of active ingredient. A single method of conversion has been chosen for active ingredients having more than one way of being converted. For example in this report, copper compounds are expressed in their metallic copper equivalent, and others such as 2,4-D and glyphosate are expressed in their acid equivalent.

Agricultural chemicals: The phrase agricultural chemicals refers to the active ingredients in fertilizers and pesticides.

Carrier: An inert liquid, solid, or gas added to an active ingredient to make a pesticide dispense effectively. A carrier is also the material, usually water or oil, used to dilute the formulated product for application.

Common name: The common name is an officially recognized name for an active ingredient. This report shows active ingredient by common name.

Diluent: Any liquid or solid material used to dilute or carry an active ingredient.

Farm: Any establishment from which \$1,000 or more of agricultural products were sold or would normally be sold during the year. Government payments are included in sales. Places with all acreage enrolled in set aside or other government programs are considered operating.

Pesticides: As defined by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), includes any substance or mixture of substances intended for preventing, destroying, repelling or mitigating any pest, and any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant.

Repellent: A pesticide used to keep target pests away from a treated area by saturating the area with an odor that is disagreeable to the pest.

Synergist: A material which exhibits synergism, the joint action of the different agents results in an effect greater than the sum of their separate effects.

Trade name: A trademark name given to a specific formulation of a pesticide product. A formulation contains a specific concentration of the active ingredient, carrier materials, and other ingredients such as emulsifiers and wetting agents. Some formulations as in the case of pre-mixes, can contain more than one active ingredient.

Trade Name, Common Name, and Pesticide Class

The following is a list of the common name, associated class and trade name of active ingredients in this publication. The classes are herbicides (H), insecticides (I), fungicides (F), and other chemicals (O). This list is provided as an aid in reviewing pesticide data. Pre-mixes are not cataloged. The list is not complete for all pesticides used and NASS does not mean to imply the use of any specific trade name.

Class	: Common Name	: Trade Name
Н		several
H	2,4-D, Dimethlamine salt	Saber, Weed-B-Gon
H	2,4-DB	Butoxone, Butyrac
0	4-tert-Amylphenol	Bio-Phene, TEK-TROL
Ī	Abamectin	Agri-Mek, Avid, Zephyr
Ī	Acephate	Orthene, Payload
H	Acetochlor	Harness, Topnotch
H	Acifluorfen	Blazer, Tackle
H	Alachlor	Lasso
I	Aldicarb	Temik
Ō	Alkyl dimethyl benzyl	T-San, Lysol
0	Alkyl dimethyl ethyl benzyl	T-San
0	Aluminum phosphide	Fumitoxin
H	Ametryn	Evik
I	Amitraz	— · — · —
H	Amitrole	Ovasyn
		Amitrol-T
H	Ammonium benzadox	Topcide
0	Ammonium soap	Creolin, Hinder
0	Amylphenol, Sodium Salt	Moormakleen
H	Atrazine	AAtrex, Atrazine
I	Azinphos-methyl	Guthion
H	Barban	Carbyne
I	Bendiocarb	Turcam
H	Benefin	Balan
F	Benomyl	Benlate
H	Bentazon	Basagran, Pledge
0	Benzylchlorophenol	Bio-Phene, TEK-TROL
I	Bicycloheptene	several
I	Bifenthrin	Brigade, Capture
I	Bomyl	Purina Fly Bait
0	Brodifacoum	several
H	Bromacil	Hyvar
0	Bromadiolone	several
0	Bromethalin	Assault, Trounce
H	Bromoxynil	Brominal, Buctril
I	BT (Bacillus thuringiensis)	several
I	Butoxypolypropylene glycol	Repel X
H	Butylate	Genate, Sutan
0	Capric acid	Mandate
0	Caprylic acid	Mandate
F	Captan	Captan
I,O	Carbaryl	Savit, Sevin
I	Carbofuran	Furadan
H	Chlorimuron-ethyl	Classic
0	Chlorine dioxide	Oxine
0	Chlorophacinone	Rozol
F	Chlorothalonil	Bravo

		Trade Name
I	Chlorpyrifos	Dursban, Lorsban
I	Chlorpyrifos-methyl	Reldan
H	Chlorsulfuron	Glean
0	Cholecalciferol	Quintox
0	Citric acid	Mandate
H	Clomazone	Command
H	Clopyralid	Reclaim, Stinger
F	Coal tar creosote	Creosote Solution
F	Copper hydroxide	several
F	Copper sulfate	Copper sulfate
I	Coumaphos	Co-Ral
F	Cresol	Creolin
I	Crotoxyphos	Ciovap
H	Cyanazine	Bladex, Conquest, Extrazine
I I	Cyfluthrin	Baythroid Ammo, Cymbush
Ī	Cypermethrin Cyromazine	Trigard
H	Diallate	Avadex
I	Diazinon	several
H	Dicamba	Banvel
H	Dichlobenil	Casoron, Norosac
Н	Dichlorprop	Weedone
Ī	Dichloryos	several
I	Dicofol	Kelthane
Н	Difenzoquat	Avenge
0	Difethialone	D-cease
I	Diflubenzuron	Dimilin, Micromite, Vengeance
H	Dimethenamid	Frontier, Guardsman
I	Dimethoate	several
F	Dimethomorph	Acrobat
I	Dioxathion	Del-Tox
0	Diphacinone	Ramik
H	Dipotassium Endothall	Aquathol K
I H,O	Dipropyl isocinchomeronate Diquat	Tox-O-Wik Diquat
н,О	Diuron	Direx, Karmex
0	Dodecylbenzene sodium sulfonate	Monarch
I	Doramectin	Dectomax
Ī	Endosulfan	Thiodan
Ī	Eprinomectin	Eprinex
Н	EPTC	Eptam, Eradicane, Genep
I	Esfenvalerate	Asana
H	Ethalfluralin	Curbit, Sonalan
0	Ethephon	Cerone, Ethrel, Prep
I	Ethion	Ethion
I	Famphur	Warbex
F	Fenarimol	Rubigan
H	Fenoxaprop-ethyl and-p-ethyl	Option, Whip
I	Fenoxycarb	Comply
I I	Fenthion Fenvalerate	Lysoff, Tiguvon
H		Ectrin, Pydrin Fusilade
I	Fluazifop-P-butyl Flucythrinate	AAstar, Pay-off, Guardian
H	Flumetsulam	Broadstrike
H	Fomesafen	Reflex
I	Formetanate hydrochloride	Carzol
	· · · · · · · · · · · · · · · · · · ·	

O Gibberellic acid H Glufosinate-ammonium H,O Glufosinate-ammonium H,O Glufosinate-ammonium H H Halosulfuron H Halosulfuron H Hexazinone I Hydramethylnon H Imazamethabenz H Imazapyr, isopropylamine salt I Imagential Imagential Salt Imagen		: Common Name	: Trade Name
H.O. Glyphosate H. Halosulfuron H. Haszalnone H. Imazamethabenz H. Imazapyr, isopropylamine salt H. Im	0	Gibberellic acid	GibGro, ProGibb, ProVide
H Halosulfuron Velpar I Hydramethylnon Amdro I Hazamethabenz Assert H Imazamyr Lightning, Topsite H Imazapyr, isopropylamine salt H Imazapyr I Imidacloprid I Ivermectin I Vomec I Ivomec I Limdane H Linuron I Lindane H Linuron I Malathion F Mancozeb H MCPA H MCPA H MCPB H MCPB F Metalaxyl I Methomyl I Lannate I Methoprene I Methoprene I Methoyl I Methowyl I Methoprene I Methyl parathion F Metiram H McOlachlor H Metribuzin H Metribuzin H Metsulfuron-methyl I Metwinphos H MSMA F Myclobutanil I Naled H Napropamide H Oyryalin H Oyryalin H Oyryalin H Oyryalin H Oyryalin I Petroleum distillate I Permethrin P Pebulate H Pepulate H Perometor D Potassium o-benzyl-p-chlorophenate O Potassium a-tert-amylphenate O Potassium a-tert-amylp			
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Hydramethylnon			
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H Propanoic acid Phos-Circ			Ramrod
	H		

Class	: Common Name	:	Trade Name
I	Propargite		Comite, Omite
H	Propazine		Milogard
H	Prosulfuron		Peak
I	Pyrethrins		Buhach, Firmotox
I	Pyridaben		Nexter, Pyramite
H	Pyridate		Tough
I	Pyriproxyfen		Knack
H	Quinclorac		Facet
I	Ronnel		Golden Marlin
I	Rotenone		Rotenone
0	Scilliroside		Rat-Nip
H	Sethoxydim		Poast
I	Silicon dioxide		Celite, Diatomaceous earth
H	Simazine		Princep
Ο	Sodium chlorate		several
Ο	Sodium Hypochlorite		several
H	Sodium Metaborate		Bareground
Ο	Sodium o-benzyl-p-chlorphenate		Moormakleen
0	Sodium o-phenylphenate		several
F	Streptomycin		Agri-Strep
H	Sulfometuron methyl		Oust
H	Sulfosate		Touchdown
I,F	Sulfur		several
I	Tebufenozide		Confirm
H	Tebuthiuron		Spike
I	Tefluthrin		Force
H	Terbacil		Sinbar
I	Tetrachlorvinphos		Rabon
I	Tetramethrin		Raid
H	Thifensulfuron methyl		Pinnacle
H	Thiobencarb		Bolero
I	Toxaphene		Stock Tox
H	Triasulfuron		Amber
H	Tribenuron-methyl		Express
I	Trichlorfon		Dylox, Proxol
H	Triclopyr		several
H I	Trifluralin Trimethacarb		Treflan, Trific, Trilin Broot
H	Vernolate		Vernam
п О	Warfarin		D-Con, Tom Cat
I	Xylene		Warbex
I	Zeta-cypermethrin		Fury, Mustang
0	Zinc phosphide		several
	ZITIC PHOSPHIAG		severar

SECTION K - CHEMICAL APPLICATIONS (Livestock and Poultry)

	3	SECTION K - CHEW	ICAL API	LICATIO	ino (rives	tock and P	ouitry)	
3.	cattle, hogs,	e any insecticides, or other sheep, poultry or equine or	nyourtotala	ores operated		1		
4.	☐ YES - [Co	o aet complete information	on all pestid	ides and cher	•	-		
	livestock and	poultry on your total acres	operatedin	1997.				
						299 LINES	CE USE 122 IN TABLE	
Resi	pondent Bookl	NOTE: Complete tables t les if necessary. Include let, record the name and for quid or dry, and (if available	mulation of th	e product app	lied, what it v	, hogs, sheep, cal products. I was us ed for (ins	poultry or eq f no code is lis ecticide, fungio	uine . Use sted in the ide, other),
LIVI	ESTOCK AND	POULTRY TABLE					[If colum answered, o columns	complete
	1	2	3	4 C)R 5	6	7	8
L N E	COMMODITY CODE 2 Beef Cattle 3 Dairy Cattle 4 Hogs 5 Sheep 6 Poultry 7 Equine	What pesticide and chemical products were applied to the [column 1] commodity on your total acres operated?	Was this product bought in liquid or dry form?	What was the TOTAL amount applied?	How much was applied per head/bird per application	d 13 Quarts 14 Pints 15 Ounces 30 Grams 31 CC/ml 35 Tags 37 Pill	How many head/birds were treated with this product?	How many times was it applied?
	CODE	[U se Codes in Respondent Booklet]	[Enter L or D.]	QU ANT IT Y	QUANTITY	[Enter Unit Code.]	NUMBER	NUMBER
201	113	114		115	116	117	120	119
202	113	114		1 1 5	116	117	120	119
203	113	114		1 1 5	116	117	120	119
204	113	114		1 1 5	116	117	120	119
250	113	114		1 1 5	116	117	120	119
	113	114		1 15	116	117	120	119
206	113	114		1 15	116	117	120	119
207	113	114		1 15	116	117	120	119
208 209	113	114		115	116	117	120	119
210	113	114		115	116	117	120	119
211	113	114		115	116	117	120	119
	INE (H	Pesticide Type Herbicide, Insecticide Fungicide, etc.)		T radename mulation	Form	n Purchased quid or Dry)	W here Purch [Ask only if E cannot be re	EPA No.
					Comple 1- Incomple		Page Only	000

	SECTION	K - CHEMICAL APP	LICATIONS	General Farm	Use)	
ι	 Were any herbicides, insecticides, fungicides or other chemicals used for general farm uses on your total acres operated? [Include buildings, structures, road, ditches, ponds, etc.] YES - [Continue.] NO - [Enter 3 in Code Box 123, and go to Section L.] 					
6. [Now I need to get complete chemicals applied on this op	e information on general fam peration in 1997	nuse of all pesti	iddes and		
`	a a mada a para a mila a	S G G T T T 7 7 7 .		399 OF	FICE USE 124 S IN TABLE	
buildi Res p	ngs,structures,roads,ditcl ondentBooklet.recordthe	te tables for general farm us hes, storage facilities, etc. name and formulation of the dry, and (if available) its EPA	Use supplement: e product applie	al tables if necessary. d. what it was used f	If no code is listed in the	
GENE	RAL FARM USE TABLE 1	2	3	4	6	
L I N E	General Farm Use Code 9 Grain Storage Fadility 10 Buildings/Structures 11 Roads/Ditches 12 Other	W hat pesticide and chemical products were applied to the [column 1] on your operation?	W as this product bought in liquid or dry form?	What was the TOTAL amount applied?	[Enter unit code.] 1 POUNDS 12 GALLONS 13 QUARTS 14 PINTS 15 OUNCES	
	CODE	[U s e codes in Respondent Booklet.]	[Enter L or D.]	QUANTITY	30 GRAMS	
301	113	114		115	117	
302	113	114		115	117	
303	113	114		115	117	
304	113	114		115	117	
	113	114		115	117	
305	113	114		115	117	
306	113	114		115	117	
307	113	114		115	117	
308	113	1114		115	117	
309	113	1114		115	117	
310						
311	113	114		115	117	
312	113	114		115	117	
	NE Pesticide T yp (Herbicide, Insec Fungicide, et	ticide and Formi		Form Purchased (Liquid or Dry)	W here Purchased [Ask only if EPA No. cannot be reported.]	
				Completion Code for Thi	a Roga Only	

Completion Code for This Page Only	000
1-Incomplete	123
3-Valid Zero	

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Report Features

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