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Agricultural Chemical Usage Swine and Swine Facilities

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Table of Contents

	Page
Overview	2
Highlights	3
Number of Positive Usable Swine Chemical Use Reports (MAP)	3
Swine Inventories	4
Chemical Applications Table - All Swine	5
Chemical Applications Table - All Swine Facilities	6
Chemical Application Methods - All Swine	7
Chemical Applications by Target Pest - All Swine	7
Chemical Applications by Facility	7
Survey Procedures	8
Estimation Procedures	8
Reliability	8
Terms and Definitions	9
Pesticide Class, Common Name, and Trade Name	11
Survey Instrument	13
Report Features	17

2005 Agricultural Chemical Use Estimates for Swine and Swine Facilities

Overview: The agricultural chemical use estimates in this report are based on data compiled from a survey conducted in the summer of 2006 in 17 Program States, which contain approximately 94 percent of the U.S. hog inventory. The Program States are the 17 States published individually in the *Quarterly Hogs and Pigs* report. These States are listed in the inventory table on page 4 of this report.

This report provides insecticide use information on the swine sector of agriculture. All data refer to the on-farm use of active ingredients contained in insecticides applied during the 2005 calendar year. Insecticides are applied to swine and swine facilities to control mange/mites, lice, flies, and other pests.

Chemical data are provided on a rate per head per application and rate per head per year basis. Some swine received no chemical applications in 2005, whereas, other hogs and pigs received multiple applications of the same chemical. In yet other cases, swine received applications of several different chemicals. The number of times a chemical was applied varied significantly based on product formulation, method of application, and pest stress at particular locations. The rate per head data cannot be used to calculate the actual number of head treated with a particular chemical. June 2006 hog and pig inventories are reprinted in this report from the September 2006 *Quarterly Hogs and Pigs* report.

This report excludes pharmaceutical products that treat swine for internal pests. 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, or worms. Some products can be classified as either a pesticide or a pharmaceutical because they treat both external and internal pests. Examples of dual purpose products are Doramectin and Ivermectin. These products can be applied to swine internally through oral dosage or injection, or applied externally as a pour-on. Also excluded are disinfectants and sanitizers. Only insecticide data were collected and summarized.

Insecticide use information on chemical applications made to swine facilities is also included in this report. Herbicide and termite chemical applications are excluded, as are all rodenticides.

Highlights

All Swine: Agricultural producers applied 22,856 pounds of insecticides to hogs and pigs in the 17 Program States in 2005.

Phosmet, at 12,154 pounds, was the top active ingredient used on swine with respect to total quantity used, followed by malathion at 5,415 pounds, and tetrachlorvinphos (Z-isomer) at 3,224 pounds. These three active ingredients accounted for 91 percent of the total pounds of active ingredients applied to swine in the 17 Program States in 2005.

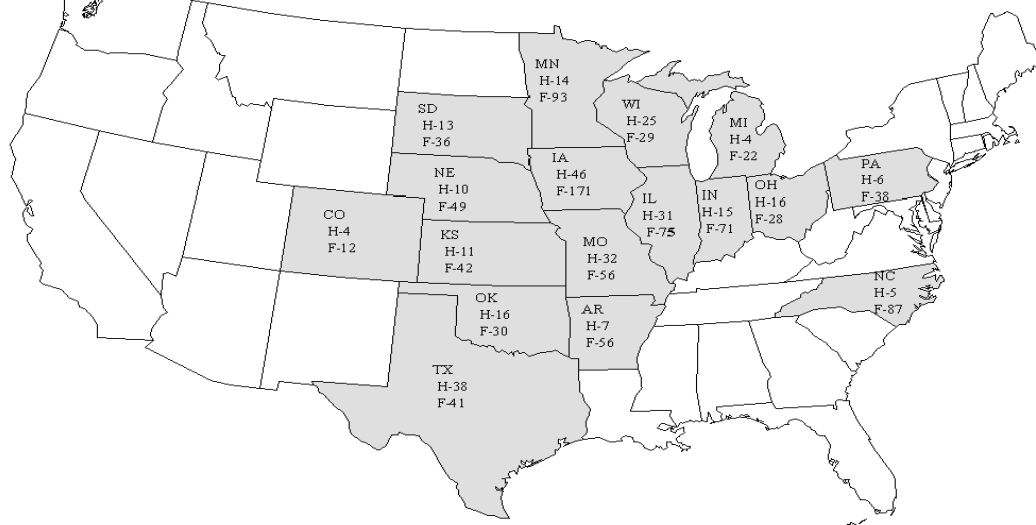
Of the total chemical applications made to swine in 2005 in the 17 Program States, 45 percent were applied by spray, 25 percent by injection, 10 percent through feed additives, 15 percent as pour-on, and 2 percent by dust bag. All other methods accounted for the remaining 3 percent of the chemical applications.

Of the total chemical applications made to swine in 2005 in the 17 Program States, 53 percent were for mange/mites, 27 percent for lice, and 10 percent for flies. All other pests accounted for the remaining 10 percent.

All Swine Facilities: In the 17 Program States, a total of 12,925 pounds of insecticides were applied to hog and pig facilities in 2005. Malathion had the highest quantity used at 4,073 pounds. Cyfluthrin had the second highest quantity used at 2,361 pounds followed by imidacloprid at 1,753 pounds.

Of the total chemical applications to hog facilities in the 17 Program States in 2005, 75 percent were applied to total confinement buildings, 13 percent to open buildings with no outside access, and 10 percent to open buildings with outside access. All other buildings accounted for 2 percent of the chemical applications.

Number of Positive Usable Swine and Swine Facilities
Chemical Use Reports
H - Hogs and Pigs
F - Hog Facilities



**U.S. Quarterly Hog & Pig Inventory
by State, June 1, 2006**

State	Breeding <i>1,000 Head</i>	Market <i>1,000 Head</i>	Total <i>1,000 Head</i>
AR	85	195	280
CO	150	690	840
IL	430	3,770	4,200
IN	320	2,880	3,200
IA	1,080	15,420	16,500
KS	160	1,670	1,830
MI	100	870	970
MN	590	6,110	6,700
MO	350	2,350	2,700
NE	365	2,585	2,950
NC	1,020	8,580	9,600
OH	165	1,445	1,610
OK	360	2,000	2,360
PA	100	990	1,090
SD	160	1,300	1,460
TX	105	855	960
WI	55	375	430
Other States	465	3,272	3,737
US	6,060	55,357	61,417

**All Swine:
Agricultural Chemical Applications,
Program States, 2005**

Agricultural Chemicals	Rate per Application	Rate per Market Year	Total Applied
	<i>Grams per head</i>	<i>Grams per head</i>	<i>Pounds</i>
Insecticides:			
Amitraz	0.751	2.344	637
Carbaryl	*	*	*
Coumaphos	*	*	*
Cyfluthrin	*	*	*
Dichlorvos	*	*	*
Doramectin	0.012	0.013	6
Ivemectin	0.027	0.034	81
Malathion	6.192	22.537	5,415
Methomyl	*	*	*
Permethrin	0.401	1.184	929
Phosmet	1.961	5.026	12,154
Piperonyl butoxide	0.037	0.426	162
Pyrethrins	0.005	0.057	20
Sulfur	*	*	*
Tetrachlorvinphos (Z-isomer)	0.262	1.512	3,224
Tricosene	*	*	*
Total Insecticides	NA	NA	22,856

* Insufficient number of reports to publish data.

**All Swine Facilities:
Agricultural Chemical Applications,
Total Applied, Program States, 2005**

Agricultural Chemicals	Total Applied <i>Pounds</i>
Insecticides:	
Abamectin	*
Acephate	*
Butoxypolypropylene glycol	*
Carbaryl	41
Chlorpyrifos	*
Coumaphos	*
Cyfluthrin	2,361
Cypermethrin	*
Diazinon	1,702
Dichlorvos	128
Dioxathion	*
Doramectin	*
Fenvalerate	*
Imidacloprid	1,753
Lambda-cyhalothrin	5
Malathion	4,073
Methomyl	435
Naled	*
Octacide-264	*
Permethrin	910
Phosmet	102
Piperonyl butoxide	528
Pyrethrins	81
Pyriproxyfen	*
Tetrachlorvinphos (Z-isomer)	101
Tetramethrin	1
Tricosene	370
Total Insecticides	12,925

* Insufficient number of reports to publish data.

**All Swine: Chemical Applications
Percent of Total Applications
by Method of Application, 2005**

Method	All Swine <i>Percent</i>
Spray	45
Injection	25
Feed Additive	10
Pour-On	15
Dust Bags	2
Other	3
Total	100

**All Swine: Chemical Applications
Percent of Total Applications by Target Pest, 2005**

Target Pest	All Swine <i>Percent</i>
Mange/Mites	53
Lice	27
Flies	10
Other	10
Total	100

**All Swine Facilities: Chemical Applications
Percent of Total Applications by Facility Treated, 2005**

Facility	All Facilities <i>Percent</i>
Total Confinement	75
Open Building With No Outside Access	13
Open Building with Outside Access	10
Other	2
Total	100

Survey Procedures: The estimates in this report are based on the 2006 National Animal Health Monitoring System (NAHMS) Swine Survey conducted in July 2006 in the 17 Program States. This survey was based on a sample of operators meeting the criteria of 100 or more hogs and pigs raised on their operations from the National Agricultural Statistics Service (NASS) list frame. The swine population targets the independent producers and contract operations that raise hogs. Enumerators collected a variety of information including swine insecticide applications for respondents' entire operation. Data were collected in the headquarter's State for each selected operation.

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

Estimates of total amount of active ingredient applied are based on hog inventory as of June 1, 2006, for operations with 100 or more hogs in the Program States. These operations account for more than 99 percent of the hog inventory. The estimates for total amount applied will not be revised even if there are subsequent inventory revisions. Data in this report are published for the Program States only. Detailed data within a table may not sum to totals due to independent rounding of published values. June 2006 hog inventory estimates were published in the *Quarterly Hogs and Pigs* report on September 29, 2006. Hog and pig inventory by size group was published in the *Farms, Land in Farms, and Livestock Operations, 2005 Summary* published January 31, 2006

Reliability: The survey was designed so that the estimates are statistically representative of chemical use on swine and swine facilities. 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. 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 ivermectin, will exhibit less variability than a more rarely used product.

For more commonly used chemicals, cv's will range from 50-150 percent at the U.S. level. Some rare items could have cv's above 200 percent. These rare items have an insufficient number of reports for publication and 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 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.

Agricultural chemicals: The active ingredients in fertilizers and pesticides.

Application rates: The average weight of a pesticide active ingredient applied per head of livestock. For this survey, rate per application is the average number of grams applied in one application. Rate per year is the average number of grams applied counting multiple applications.

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

Dust Bags: An application method where the chemical is applied by either the animal hitting the bag containing an insecticide or a person shaking the bag over the animal.

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 conservation or other government programs are considered operating farms.

Facility: A structure and/or area where the animals are located or to which they have access.

Injectibles: Pesticides applied by injection. Some injectibles control internal parasites with added benefit of external control.

Open Building With No Outside Access: Any building for housing swine that is open on one or more sides all year (natural ventilation); however, animals always have roof overhead. Open sides of the building might have a curtain.

Open Building With Outside Access: Any building where swine have access to an outside area (such as an uncovered pen).

Pesticides: As defined by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA); include 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. An insecticide is a class of pesticides that is used to control insects.

Pour-Ons: Insecticides formulated for direct application to the backlines of animals. The chemical is absorbed through the skin and circulates through the animal's system.

Sprays: Emulsifiable concentrates or soluble formulations are usually used with smaller sprayers. Animals are usually sprayed with enough solution to cover the animal thoroughly.

Total Confinement: Refers to animals restricted to being inside a building that has mechanical ventilation.

Trade name: A 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.

Pesticide Class, Common Name, and Trade Name

The following is a list of the associated class, (I=Insecticide) and active ingredients included in this report. Also provided are product trade names associated with the listed active ingredients reported in the survey. This list is provided as an aid in reviewing pesticide data. The list is not complete for all trade names used and NASS does not mean to imply the use of any specific trade name.

Class	Common Name	Trade Name
I	Abamectin	Fatal Attraction
I	Acephate	Orthene 75 S
I	Amitraz	Tactic E. C.
I	Butoxypolypropylene glycol	Repel X Fly Spray
I	Carbaryl	Sevin Bait (5%), Sevin 4F, Sevin Bait
I	Chlorpyrifos	Dursban 4E, Duplex TR
I	Coumaphos	Co-Ral Flowable, Insecticide, Co-Ral Insecticide, Dust, Co-Ral Livestock Spray (5.8%)
I	Cyfluthrin	Countdown WP Premise Insecticide, Countdown EC Premise, CyLence Pour-on, Duraplex TR, Tempo(1%) Dust, Tempo 2, Tempo 20 WP Demon EC, Viper Insecticide Concentrate
I	Diazinon	Diazinon AG500(4E), Diazinon 50W
I	Dichlorvos	Fly Bait(generic) .5% Dichlorvos, Vapona Insecticide EC, Pest Strip, Prozap VIP Insect Spray, Pyrethrin Plus Spray with Vapona, Ravap Livestock Spray EC, Vapona Concentrate Insecticide(4EC), Vapona EM-2
I	Dioxathion	Del-Tox (20.4%)
I	Doramectin	Dectomax Pour-on,
I	Fenvalerate	Ectrin (10%) WDL
I	Imidacloprid	QuickBayt Fly Bait
I	Ivermectin	Ivomec (1%) Injection, Ivomec Pour-on for Cattle, Ivomec Premix for swine
I	Lambda-cyhalothrin	Demand CS, Tiaga Z, Grenade ER Premise Insecticide, Warrior
I	Malathion	Malathion ULV 9.7lbs. (95%), Malathion`5 Dust, Malathion 8E, Malathion 5 EC (57%), 4% Malathion Powder Insecticide
I	Methomyl	Apache Fly Bait, Golden Malrin Fly Bait, Die Fly (Bait), BlueStreak Fly Bait
I	Octacide-264	CB-40 Inscticide, Bio Flea
I	Naled	Halt Fogger
I	Permethrin	Fly Killer D
I		Pounce 3.2EC, Permethrin 3.2EC, A-200 Lice Control Spray, Home Lice Control Spray, Evercide, Permethrin 10% EC, Permethrin 10 ECW, Atroban 11% EC, Ectiban D (.25%), Ectiban EC, Insectrin WP (25%),

--continued

Class	Common Name	Trade Name
I	Phosmet	Permethrin Flyand Louse Dust, Permethrin II 10% EC, Permethrin Plus, Permethrin CD Pour-on, Permethrin 20 MEC Spray, 0.25% Permethrin Dust, Bio Flea Halt Fogger, Raid Wasp and Hornet Killer 13, Synergized Pour-on, 5% Permethrin Pour-on, Gardstar 40% EC, Permethrin Insecticide Spray, SwineGuard Pour-on for Swine
I	Piperonyl butoxide	Prolate/ Lintox-HD, Prolate 1-E
I	Pyrethrins	Evergreen Crop Protection EC 60-6, Pyrenone 25-5 Pyrethrins 5% Spray, ULD BP-50, Country Vet Farm Dairy CV-40-4D, Country Vet Farm Dairy CV-40-2D, Country Vet Farm Dairy CV-40-3D Insect Spray, Permethrin Plus, Dy Fly Dairy Aerosol, LD44Z Farm Insect Fogger, Repel X Fly Spray, Permethrin CD pour-on, Fly Spray (generic), CB-40 Insecticide, Pyrethrin Plus Spray with Vapona, Prozap VIP Insect Spray, Synergized Pour-on, Moorman`s Fly Spray, Pyrenone Multi-Purpose Knockout Spray, CV-80D Country Vet Farm & Dairy Spray, Prozap LD-44Z Insect Fogger, Konk Too Flying Insect Killer, Fly-A-Rest Aerosol II, Dairy Aerosol Insect Spray, Pyrenone 25-5 Pyrethrins 5% Spray, Pyrethrin Plus Spray with Vapona
I	Pyriproxyfen	Evergreen Crop Protection EC 60-6, Pyrenone 25-5 Pyrethrins 5% Spray, ULD BP-50, Country Vet Farm Dairy CV-40-4D, Country Vet Farm Dairy CV-40-2D, Country Vet Farm Dairy CV-40-3D Insect Spray, Dy Fly Dairy Aerosol, LD44Z Farm Insect Fogger, Repel X Fly Spray
I	Tetrachlorvinphos(Z-isomer)	Fly Spray (generic), CB-40 Insecticide, Pyrethrin Plus Spray with Vapona, Prozap VIP Insect Spray, Moorman`s Fly Spray, Pyrenone Multi-Purpose Knockout Spray, CV-80D Country Vet Farm & Dairy Spray, Prozap LD-44Z Insect Fogger, Konk Too Flying Insect Killer, Fly-A-Rest Aerosol II, Dairy Aerosol Insect Spray
I	Tetramethrin	Bio Flea Halt Fogger
I	Tricosene	Rabon 50 WP, Rabon 3 Livestock Dust, Ravap Livestock Spray EC, Rabon 7.76 Oral Larvicide Premix Raid Wasp and Hornet Killer 13 Golden Malrin Fly Bait, Quick Fly Bait

SECTION 8: Chemical applications to hogs and pigs

Now I have some questions about insecticides and chemical applications on this site/operation.

60. During 2005, on the site/operation, were any insecticides or other chemical products applied to hogs or pigs to control insects and other external pests (include custom applications)?

YES - (Continue)

NO - (Enter code 3 in box 0800 and go to Section 9)

	000
1 – Incomplete 3 – Valid Zero	0800
LINES IN TABLE	0801

[ENUMERATOR NOTE: Complete tables for all chemical applications to Hogs. Use supplemental tables if necessary. If no code is listed in the Respondent Booklet, record the name and formulation of the insecticide product applied, what it was used for, whether it was liquid or dry, and its NADA/EPA registration number.]

	L I N E	1		2	3
		What product(s) were applied to your hogs or pigs? (Show product codes from Respondent Booklet)		Formulation Was this product bought in liquid or dry form? L = Liquid D = Dry	What was the method of application? 1 Spray 2 Injection 3 Feed Additive 4 Pour-on 5 Dust Bags 6 Other
NOTES		Product	Code	Unit Code	Code
	802		0810		0811
	803		0810		0811
	804		0810		0811
	805		0810		0811
	806		0810		0811
	807		0810		0811
	808		0810		0811
	809		0810		0811

Line	(INSECTICIDE)	NADA/EPA No. or Tradename and Formulation	Form Purchased (Liquid or Dry)	Where Purchased [Ask only if NADA/EPA No. cannot be reported]

SECTION 8:

CHEMICAL APPLICATIONS TO HOGS AND PIGS (continued)

L I N E	4	5	or	6	7	8	9
	How many head were treated with this product?	How much was applied per HEAD per application?		What was the TOTAL amount applied per application?	1 Pounds 12 Gallons 13 Quarts 14 Pints 15 Ounces (L) 28 Ounces (D) 30 Grams 31 Cc/ml 41 Liters 50 Other	How many times was this applied?	What was the primary target pest for this application? 1 Mange/mites 2 Lice 3 Flies 4 Other
	Head	Amount		Amount	Unit Code	Number	Code
802	0812	0813		0814	0815	0816	0817
803	0812	0813		0814	0815	0816	0817
804	0812	0813		0814	0815	0816	0817
805	0812	0813		0814	0815	0816	0817
806	0812	0813		0814	0815	0816	0817
807	0812	0813		0814	0815	0816	0817
808	0812	0813		0814	0815	0816	0817
809	0812	0813		0814	0815	0816	0817

SECTION 9: CHEMICAL APPLICATIONS TO HOG FACILITIES

61. In 2005, on this site/operation, did you apply any **insecticides** or other **chemical** products to Hog and Pigs facilities to control insects? Include buildings that are by hogs and pigs, such as confinement barns, lean-tos, sun-shades, etc.

- YES - (Continue)
 NO - (Enter 3 in code Box 0900 and go to Section 10)

	000
1 – Incomplete 3 – Valid Zero	0900
LINES IN TABLE	0901

[ENUMERATOR NOTE: Complete tables for all insecticide applications to Hogs and Pig **facilities**. Hogs and Pig **facilities** include buildings, structures, etc. Use supplemental tables if necessary. If no code is listed in the Respondent Booklet, record the name and formulation of the product applied, what it was used for (insecticide, other), whether it was liquid or dry, and its EPA registration number.]

	1	2	3
L I N E	Facility treated 10 Total Confinement (with mechanical ventilation) 11 Open building with no outside access 12 Open building with outside access 15 Other	What product(s) were applied to the [column 1] facility? [Show product codes from Respondent Booklet]	Was this product bought in liquid or dry form? L = Liquid D = Dry
NOTES	Facility	Code	Product Code
	902	0910	0911
	903	0910	0911
	904	0910	0911
	905	0910	0911
	906	0910	0911
	907	0910	0911
	908	0910	0911
	909	0910	0911

LINE	Pesticide Type (INSECTICIDE)	EPA No. or Tradename and Formulation	Form Purchased (Liquid or Dry)	Where Purchased [Ask only if EPA No. cannot be reported.]
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

SECTION 9:

CHEMICAL APPLICATIONS TO HOG FACILITIES (continued)

L I N E	4		5		6	
	What was the TOTAL amount applied per application?		1 Pounds 12 Gallons 13 Quarts 14 Pints 15 Ounces (L) 28 Ounces (D) 30 Grams 31 Cc/ml 41 Liters 50 Other		How many times was this applied?	
	Amount		Unit Code		Number	
902	0912	• ___	0913		0914	
903	0912	• ___	0913		0914	
904	0912	• ___	0913		0914	
905	0912	• ___	0913		0914	
906	0912	• ___	0913		0914	
907	0912	• ___	0913		0914	
908	0912	• ___	0913		0914	
909	0912	• ___	0913		0914	

Report Features

Listed below are persons within the National Agricultural Statistics Service to contact for additional information.

Liana Cuffman, Environmental Statistician	(202) 690-0392
Mark R. Miller, Head, Environmental and Demographics Section	(202) 720-0684
Vacant, Chief, Environmental, Economics, and Demographics Branch	(202) 720-6146

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