United States
Department of
Agriculture

National
Agricultural
Statistics
Service

Agricultural Chemical Usage
1999 Swine and Swine Facilities

December 2000

Ag Ch 1 (00)

1999 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 fall of 2000 in 17 selected States, which contain approximately 93% of the U.S. hog inventory.

This report provides insecticide use information on the swine sector of agriculture. All data refer to the on-farm use of chemical active ingredients contained in insecticides applied during the 1999 calendar year. Insecticides are applied to swine and swine facilities to control mange, mites, lice, flies, and other pests.

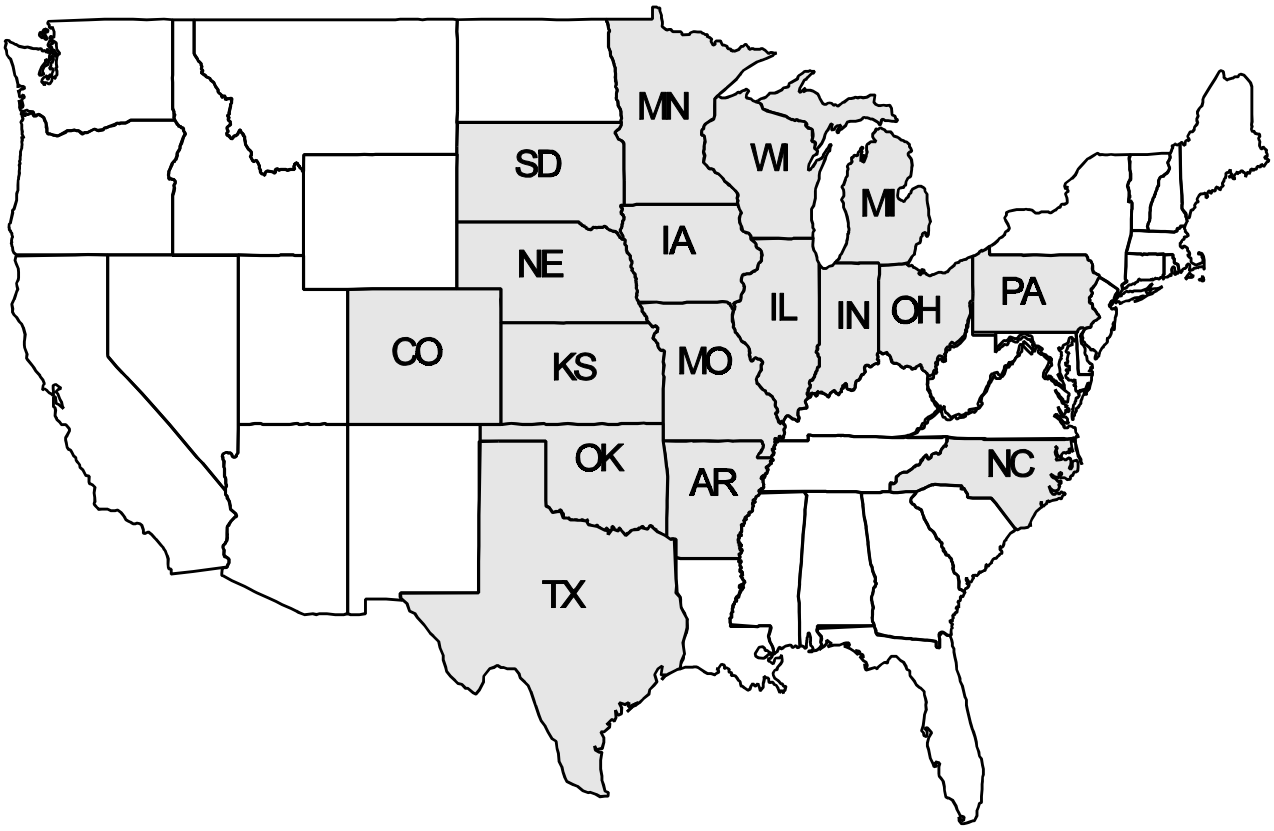
Chemical data are provided on a rate per head per application and rate per head per year basis. Some swine received no chemical applications in 1999, whereas, other hogs and pigs received multiple applications of the same chemical. In yet other cases, swine received applications of several different chemicals. The number of times a chemical is applied varies 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. Hog and pig inventories are reprinted in this report from a previous NASS release. This table is included for informational purposes only.

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

States Participating in the 1999 Swine Chemical Use Study



U.S. Quarterly Hog & Pig Inventory
by State, December 1, 1999

State	Breeding	Market	Total
	1,000 Head	*1,000 Head*	*1,000 Head*
AR	110	600	710
CO	210	700	910
IL	420	3,630	4,050
IN	370	2,880	3,250
IA	1,160	14,240	15,400
KS	150	1,310	1,460
MI	120	860	980
MN	560	4,940	5,500
MO	410	2,740	3,150
NE	390	2,610	3,000
NC	1,000	8,500	9,500
OH	170	1,310	1,480
OK	310	1,950	2,260
PA	120	930	1,050
SD	120	1,140	1,260
TX	80	790	870
WI	65	505	570
Other States [1]	479	3,459	3,937
US	6,244	53,094	59,337

[1] Individual state estimates not available for the 33 other states.

Number of Summarized Reports

All Swine, Insecticide Use
U.S., 1999

Treatment Site	United States
	Number
All Swine	650

All Swine Facilities, Insecticide Use
U.S., 1999

Treatment Site	United States
	Number
All Swine Facilities	914

Highlights

All Swine: Agricultural producers applied 49,950 pounds of insecticides to hogs and pigs in the 17 surveyed States in 1999.

Piperonyl butoxide, at 16,749 pounds, was the top active ingredient used on swine with respect to total quantity used, followed by amitraz at 12,260 pounds and malathion at 8,270 pounds. These three active ingredients accounted for 75 percent of the U.S. total pounds of active ingredients applied to swine in 1999.

Of the total chemical applications made to swine in 1999 in the 17 selected States, 52 percent were applied by spray, 26 percent by injection, 11 percent as pour-on, 9 percent through feed additives, and 1 percent by dust bag. All other methods accounted for the remaining 1 percent of the chemical applications.

All Swine Facilities: In the 17 surveyed States, a total of 6,287 pounds of insecticides was applied to hog and pig facilities in 1999. Malathion had the highest quantity used at 1,133 pounds. Permethrin had the second highest quantity used at 1,099 pounds followed by piperonyl butoxide at 609 pounds.

All Swine, Insecticide Use, 1999
Total Amount Applied

	United States
	Pounds
All Swine	49,950

All Swine Facilities, Insecticide Use, 1999
Total Amount Applied

	United States
	Pounds
All Swine Facilities	6,287

All Swine: Agricultural Chemical Applications, Total Applied, U.S., 1999

Agricultural Chemical	United States
	Pounds
Insecticides:	
Amitraz	12,260
Carbaryl	*
Coumaphos	10
Dichlorvos	174
Doramectin	16
Famphur	*
Fenthion	207
Fenvalerate	63
Ivermectin	1,430
Malathion	8,270
Methoprene	*
Moxidectin	*
N-octy-bicycloheptene	*
Permethrin	505
Petroleum distillate	680
Phosmet	5,760
Piperonyl butoxide	16,749
Pyrethrins	3,227
Ronnel	*
Tetrachlorvinphos	349
Trichlorfon	*
Xylene	*
Total Insecticides	49,950

* Insufficient number of reports to publish data.

All Swine: Agricultural Chemical Applications, Rate per Head per Application, U.S., 1999

Agricultural Chemical	United States
	Grams
Insecticides:	
Amitraz	1.8
Carbaryl	*
Coumaphos	0.1
Dichlorvos	0.6
Doramectin	0.02
Famphur	*
Fenthion	1.8
Fenvalerate	0.3
Ivermectin	0.2
Malathion	30.1
Methoprene	*
Moxidectin	*
N-octy-bicycloheptene	*
Permethrin	0.3
Petroleum distillate	2.6
Phosmet	0.9
Piperonyl butoxide	7.7
Pyrethrins	1.5
Ronnel	*
Tetrachlorvinphos	1.0
Trichlorfon	*
Xylene	*

* Insufficient number of reports to publish data.

All Swine: Agricultural Chemical Applications, Rate per Head per Year, U.S., 1999

Agricultural Chemical	United States
	Grams
Insecticides:	
Amitraz	8.1
Carbaryl	*
Coumaphos	0.2
Dichlorvos	1.9
Doramectin	0.02
Famphur	*
Fenthion	3.1
Fenvalerate	0.6
Ivermectin	0.4
Malathion	181.5
Methoprene	*
Moxidectin	*
N-octy-bicycloheptene	*
Permethrin	1.0
Petroleum distillate	6.7
Phosmet	2.3
Piperonyl butoxide	12.2
Pyrethrins	2.4
Ronnel	*
Tetrachlorvinphos	14.5
Trichlorfon	*
Xylene	*

* Insufficient number of reports to publish data.

All Swine Facilities:
Agricultural Chemical Applications,
Total Applied, 1999

Agricultural Chemicals	United States
	Pounds
Insecticides:	
Abamectin	*
Acephate	*
Amitraz	248
Bomyl	*
Butoxypolypropylene glycol	*
Carbaryl	*
Chlorpyrifos	
Coumaphos	*
Cyfluthrin	140
Cypermethrin	*
Cyromazine	*
Diazinon	527
Dichlorvos	207
Dimethoate	*
Eprinomectin	*
Fenvalerate	113
Hydramethylnon	*
Lambda-cyhalothrin	161
Malathion	1,133
Methomyl	69
Methoprene	*
Methoxychlor	*
N-octy-bicycloheptene	63
Naled	*
Permethrin	1,099
Petroleum distillate	577
Phosmet	20
Piperonyl butoxide	609
Pyrethrins	126
Pyriproxyfen	*
Ronnel	7
Tetrachlorvinphos	599
Tetramethrin	*
Trichlorfon	*
Tricosene	1
Total Insecticides	6,287

* Insufficient number of reports to publish data.

All Swine: Chemical Applications
Percent of Total Applications by Method of Application, 1999

Method	All Swine
	Percent
Spray	52.2
Injection	25.7
Feed Additive	8.8
Pour-On	11.2
Dust Bags	1.1
Other	1.0
Total	100.0

Survey Procedures: The estimates in this report are based on the 2000 National Animal Health Monitoring System (NAHMS) Swine Survey conducted in June 2000. This survey was based on a sample of pre-screened operators meeting the criteria of 100 or more hogs and pigs on their operations. Enumerators conducting the survey collected a variety of information including swine insecticide applications for respondents' entire operations. 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 are converted to an active ingredient level. The chemical usage estimates in this publication consist of survey estimates of those active ingredients.

Data in this report are published at the U.S. level only. Detailed data within a table may not sum to totals due to independent rounding of published values.

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 10-90 percent at the U.S. level. Some rare items could have cv's above 100 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 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.

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); 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.

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 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, Active Ingredient, and Pesticide Class

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	Active Ingredient	Trade Name
I	Abamectin	Fatal Attraction
I	Acephate	Orthene
I	Amitraz	Taktic, Point-Guard
I	Bomyl	Purina Fly Bait
I	Butoxypolypropylene glycol	Repel X, Straight Arrow Fly Spray
I	Carbaryl	Hopkins Poultry Spray, Sevin
I	Chlorpyrifos	CSA Screwworm Spray, Duratrol, Dursban, Lorsban, Max-Con/Warrior Tags
I	Coumaphos	Co-Ral
I	Cyfluthrin	Countdown, Cutter Tags, Cylence, Tempo
I	Cypermethrin	Demon, Max-Con/ZetaGard Tags
I	Cyromazine	Larvadex
I	Diazinon	Diazinon, Optimizer/Patriot/ Terminator/Turbo/Warrior Tags
I	Dichlorvos	several
I	Dimethoate	Cygon
I	Doramectin	Dectomax
I	Eprinomectin	Eprinex
I	Famphur	Warbex
I	Fenthion	Cutter Tags, Lysoff, Spotton, Tiguvon
I	Fenvalerate	Ectrin
I	Hydramethylnon	Amdro
I	Ivermectin	Ivomec
I	Lambda-cyhalothrin	several
I	Malathion	Malathion
I	Methomyl	Apache/Die Fly/Stimukil Fly Bait, Tailspin
I	Methoprene	Altosid, Diacon, MoorMan
I	Methoxychlor	Marlate, Methoxychlor, Sur-Noxem
I	Naled	Fly Killer D

--continued

Class	:	Active Ingredient	:	Trade Name
I		Permethrin		several
I		Petroleum distillate		Ciovap, Co-Ral, Stock Tox, Vapona
I		Phosmet		Del-Phos, Prolate
I		Piperonyl butoxide		several
I		Pyrethrins		several
I		Moxidectin		Cydectin
I		N-octy-bicycloheptene		several
I		Pyriproxyfen		Bio Flea Halt Fogger
I		Ronnel		Golden Marlin Fly Bait
I		Tetrachlorvinphos		Insectaban, Rabon, Ravap, Vigortone
I		Tetramethrin		Raid
I		Trichlorfon		Dipterex, Neguvon, Starbar
I		Tricosene		Stimukil Fly Bait
I		Xylene		Stock Tox, Warbex

SECTION 8: **CHEMICAL APPLICATIONS TO HOGS AND PIGS**

Now I have some questions about insecticides and chemical applications on this operation. Please consider all applications made to hogs or pigs located on the facilities that you made day-to-day operating decisions for.

1. During 1999, on all of the sites that you operated, 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 3 in Code Box 411 and go to Section 9*)

	000
1 - Incomplete 3 - Valid Zero	411
LINES IN TABLE	412

2. Now I need to get complete information on **insecticides** (exclude herbicides and fungicides) and **chemicals** applied to Hogs and Pigs on this site/operation in 1999?

[**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.*]

NOTES	LINE	1 What product(s) were applied to your hogs or pigs? (Show product codes from Respondent Booklet) Product		2 Formulation Was this product bought in liquid or dry form? L = Liquid D = Dry Code	3 What was the method of application? 1 Spray 2 Injection 3 Feed Additive 4 Pour-on 5 Dust Bags 6 Other Code
	101		401		402
	102		401		402
	103		401		402
	104		401		402
	105		401		402
	106		401		402
	107		401		402
	108		401		402

LINE	(Insecticide)	**NADA/EPA No. or Trade name and Formulation**	**Form Purchased** (Liquid or Dry)	**Where Purchased** [Ask only if NADA/EPA No. cannot be reported.]
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

	4	5 OR 6		7	8	9
LINE	How many head were treated with this product? Number	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 30 Grams 31 CC/ml 41 Liters 50 Other Unit Code	How many times was this applied? Number	What was the primary target pest for this application? 1 Mange /Mites 2 Lice 3 Flies 4 Other Code
101	403	404 . __ __	405 . __ __	406	407	408
102	403	404 . __ __	405 . __ __	406	407	408
103	403	404 . __ __	405 . __ __	406	407	408
104	403	404 . __ __	405 . __ __	406	407	408
105	403	404 . __ __	405 . __ __	406	407	408
106	403	404 . __ __	405 . __ __	406	407	408
107	403	404 . __ __	405 . __ __	406	407	408
108	403	404 . __ __	405 . __ __	406	407	408

SECTION 9: **CHEMICAL APPLICATIONS TO HOG FACILITIES**

1. In 1999, on your total acres operated, did you apply any **insecticides** or other **chemical products** to Hog and Pig facilities to control insects? Include buildings that are used by hogs and pigs on this operation, such as confinement barns, lean-tos, sun-shades, etc.

YES ☐ **-** (*Continue*)
NO ☐ - (*Enter 3 in Code Box 413,* and go to Section 10)

2. Now I need to get complete information on **insecticides** (*exclude herbicides and fungicides*) and **chemicals** applied to Hog and Pig facilities on this site/operation in 1999.

	000
1 - Incomplete 3 - Valid Zero	413
LINES IN TABLE	414

[**ENUMERATOR NOTE**: *Complete tables for all insecticide applications to Hog and Pig **facilities**. Hog 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.*]

NOTES	LINE	1 Facility Treated 10 Total Confinement *(with mechanical ventilation)* 11 Open building with no outside access 12 Open building with outside access 15 Other (*Enter facility code*)		2 What product(s) were applied to the [*column 1*] facility? [*Show product codes from Respondent Booklet*]		3 Was this product bought in liquid or dry form? L = Liquid D = Dry
		Facility	Code	Product	Code	Code
	201		409		401	
	202		409		401	
	203		409		401	
	204		409		401	
	205		409		401	
	206		409		401	
	207		409		401	
	208		409		401	
	209		409		401	

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.]
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

LINE	4 What was the TOTAL amount applied per application?	5 1 Pounds 12 Gallons 13 Quarts 14 Pints 15 Ounces 30 Grams 31 CC/ml 41 Liters 50 Other Unit Code	6 How many times was this applied? Number
201	405 . __ __	406	407
202	405 . __ __	406	407
203	405 . __ __	406	407
204	405 . __ __	406	407
205	405 . __ __	406	407
206	405 . __ __	406	407
207	405 . __ __	406	407
208	405 . __ __	406	407
209	405 . __ __	406	407

Index

Report Features

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

Michelle Radice, Environmental Statistician	(202) 690-2284
Norman Bennett, Head, Environmental and Demographics Section	(202) 720-0684
Linda Hutton, Chief, Economics, Environmental and Demographics Branch	(202) 720-6146

The United States Department of Agriculture (USDA) prohibits discrimination in all its programs on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (braille, large print, audiotape, etc.) should contact the USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, D.C., 20250-9410, or call 202-720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

ACCESS TO REPORTS!!

For your convenience, there are several ways to obtain NASS reports, data products, and services:

INTERNET ACCESS

All NASS reports are available free of charge on the worldwide Internet. For access, connect to the Internet and go to the NASS Home Page at: **http://www.usda.gov/nass/**. Select "Today's Reports" or Publications and then Reports by Calendar or Publications and then Search, by Title or Subject.

E-MAIL SUBSCRIPTION

There are two options for subscribing via e-mail. All NASS reports are available by subscription free of charge direct to your e-mail address. 1) Starting with the NASS Home Page at **http://www.usda.gov/nass/**, click on **Publications**, then click on the **Subscribe by E-mail** button which takes you to the page describing e-mail delivery of reports. Finally, click on **Go to the Subscription Page** and follow the instructions. 2) If you do NOT have Internet access, send an e-mail message to: **usda-reports@usda.mannlib.cornell.edu**. In the body of the message type the word: **list**.

AUTOFAX ACCESS

NASSFax service is available for some reports from your fax machine. Please call 202-720-2000, using the handset attached to your fax. Respond to the voice prompts. Document 0411 is a list of available reports.

- -

PRINTED REPORTS OR DATA PRODUCTS

CALL OUR TOLL-FREE ORDER DESK: 800-999-6779 (U.S. and Canada)
Other areas, please call 703-834-0125 FAX: 703-834-0110
(Visa, MasterCard, check, or money order acceptable for payment.)

- -

ASSISTANCE

For **assistance** with general agricultural statistics or further information about NASS or its products or services, contact the **Agricultural Statistics Hotline** at **800-727-9540**, 7:30 a.m. to 4:00 p.m. ET, or e-mail: **nass@nass.usda.gov.**