



United States  
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# Agricultural Chemical Usage

## Postharvest Applications - Oats and Soybeans

March 2000

# USDA



**Postharvest Chemical Use Estimates for Oats and Soybeans**

**Overview:** The agricultural chemical use estimates in this report are based on data compiled from the Postharvest Chemical Use Surveys. Separate surveys were conducted for oats and soybeans in the summer of 1999 covering the 1998 crop. All results refer to pesticide applications made at off-farm grain storage facilities after the crops were harvested. On-farm postharvest applications were beyond the scope of this survey. The time frames for these applications were July 1, 1998 to June 30, 1999 for oats and September 1, 1998 to August 31, 1999 for soybeans, which correspond to the marketing year.

The table below shows survey coverage for the 1998 marketing year. The table includes statistics on the number of States surveyed, the number of reports summarized, and the percent of the U.S. production accounted for by the surveyed States. The following U.S. map shows the number of summarized reports by State in the 1999 survey.

Agricultural Chemical Use Survey Coverage, 1998 Marketing Year

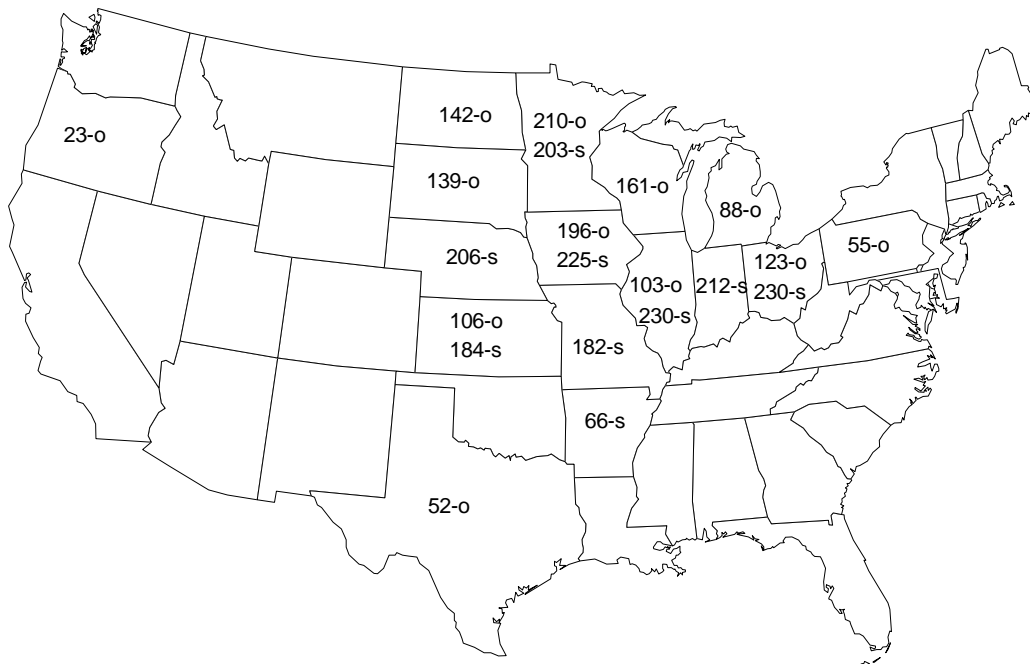
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Crop	:	States Surveyed	:	Reports Summarized	:	U.S. Production Included in Surveyed States
	:		:		:	
	:	--- Number ---	:		:	Percent
Oats	:	12	:	1,398	:	79
Soybeans	:	9	:	1,738	:	79

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**Number of Usable Reports, 1998**

**o - Oats; s - Soybeans**



After harvest, oats are generally marketed through local and/or terminal elevators, except that which is used on farm. A large portion of the oat crop is used in livestock feed. This grain may be pulled out of the marketing channel at any point. Processors are also recipients of the grain at any point along the marketing channel.

After harvest, soybeans are initially marketed through local or terminal elevators, but essentially none are used on farms. Virtually all of the soybean crop is either exported as whole beans or crushed for oil or meal. Those products are then used as ingredients in human food or livestock feed. Therefore, processors normally become recipients of the crop in the early stages of the marketing channel.

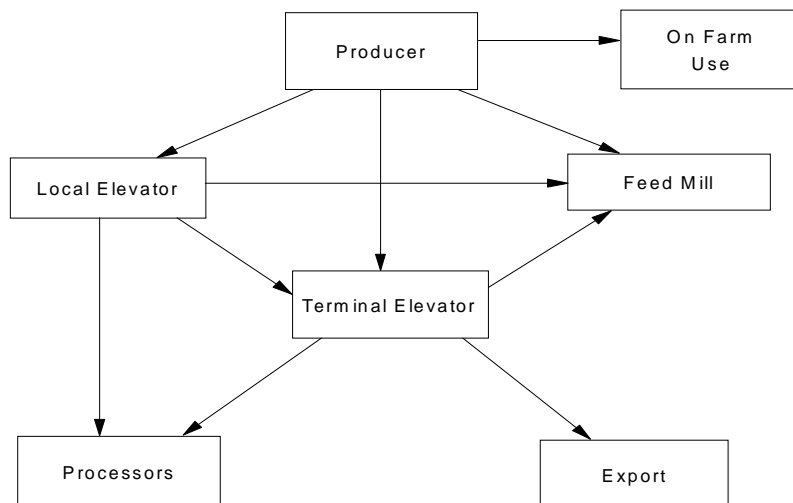
The diagram below demonstrates the postharvest marketing channel for oats and soybeans.

Oats and soybeans moving from a local elevator to a terminal elevator will be duplicated in the total amount handled. The intent of the survey was to obtain the entire amount of chemicals applied to the oats or soybeans, so this duplication in quantity handled is necessary. No provision was made for cross-State movement. The State or region of origin of the oats or soybeans was not part of the survey, so all of the oats or soybeans handled in a survey State were included in this survey.

For both oats and soybeans, totals for the States surveyed and individual State totals are published for the percent of grain treated, number of applications, rate per application, rate per marketing year, and the total amount of active ingredient that was applied. A table detailing total pesticide usage by class for the surveyed States is also included.

Grain storage operators were also asked a series of questions concerning their pest management practices. These questions are summarized and included in the report. A copy of the survey instrument, or questionnaire, that was used to collect the data is also included.

### Oats and Soybeans Postharvest Market Channels



## Highlights

**Oats:** Grain storage operators in twelve major oat producing States were surveyed following the 1998 marketing year. These States accounted for 79 percent of the total U.S. oat production.

The postharvest chemicals most commonly used on oats in the surveyed States were aluminum phosphide and malathion based on percent of grain treated. Although aluminum phosphide is commonly referred to as a fumigant, and is used to kill insects, insect larvae, and mites, it is classified as an insecticide by the EPA. Malathion is also an insecticide.

Some grain storage facilities reported applying thiram and tebuconazole, as seed treatments to oats.

Operations in the following States applied the listed chemicals to oats after harvest. However, there were an insufficient number of reports to publish State level usage data.

Iowa: Aluminum phosphide, malathion, silicon dioxide  
Michigan: Tebuconazole, thiram  
North Dakota: Aluminum phosphide, malathion  
Ohio: Malathion, bicycloheptene, piperonyl butoxide, pyrethrins  
Oregon: Chlorpyrifos-methyl, lindane, tebuconazole, thiram  
Texas: Aluminum phosphide, chlorpyrifos, chlorpyrifos-methyl, silicon dioxide.

Illinois reported no chemicals used on oats following harvest.

**Soybeans:** Grain storage operators in nine major soybean producing States were surveyed following the 1998 marketing year. These States accounted for 79 percent of the total U.S. soybean production.

The postharvest chemicals most commonly used on soybeans in the surveyed States were aluminum phosphide, carboxin and thiram based on percent of grain treated. Although aluminum phosphide is commonly referred to as a fumigant, and is used to kill insects, insect larvae, and mites, it is classified as an insecticide by the EPA.

Some grain storage facilities reported applying metalaxyl, as a seed treatment to soybeans.

Operations in the following states applied the listed chemicals to soybeans after harvest. However, there were an insufficient number of reports to publish State level usage data.

Illinois: metalaxyl  
Minnesota: metalaxyl  
Missouri: carboxin and thiram  
Nebraska: aluminum phosphide.

Indiana, Iowa and Ohio reported no postharvest chemicals used on soybeans.

**Pest Management Practices:** It was discovered during pre-survey research that pest management practices varied considerably, depending on the time of year. Therefore, seasonal data were collected on this survey and are published separately as "Spring and Summer" and "Fall and Winter". The percentages shown in this report pertain to all grains handled by the facilities sampled, not just oats or soybeans.

Oats: Postharvest Chemical Applications,  
Percent Treated and Total Applied,  
States Surveyed and Total, 1998 Marketing Year

		Percent Treated and Total Applied					
State	Volume Handled	Insecticide		Fungicide		Other Chemical	
	Mil. bu.	Percent	1,000 Lbs	Percent	1,000 Lbs	Percent	1,000 Lbs
IL	1.7						
IA 1/	11.9	.46					
KS 1/	2.0	2.35					
MI	18.9			*	*		
MN	62.2	5.84	0.7				
ND	6.9	*	*				
OH	10.3	*	*				
OR	1.9	*	*	*	*		
PA 1/	4.1	.97					
SD	7.4	3.32	0.1				
TX	32.4	1.71	0.1				
WI	19.0	9.59	0.2			*	*
Tot.	178.7	3.74	1.2				

\* Insufficient reports to publish data for this pesticide class.  
1/ Amount applied less than 50 pounds.

Oats: Postharvest Chemical Applications  
States Surveyed, 1998 Marketing Year 1/ 2/

Agricultural Chemical	Volume Treated	Appli- cations	Rate per Application	Rate per Mkt. Year	Total Applied
	Percent	Number	Pounds per	1,000 Bu.	1,000 Lbs
Insecticides:					
Aluminum phosphide	3.34	1.0	0.16	0.16	1.0
Malathion	0.26	1.0	0.34	0.34	0.2

- 1/ Volume handled by grain storage facilities in the twelve States surveyed was 178.7 million bushels. States included are IL, IA, KS, MI, MN, ND, OH, OR, PA, SD, TX, and WI.
- 2/ Insufficient reports to publish usage data for Bicycloheptene, Chlorpyrifos, Chlorpyrifos-methyl, Calcium propionate, Lindane, Piperonyl butoxide, Pyrethrins, Silicon dioxide, Tebuconazole, and Thiram.

Oats: Postharvest Chemical Applications  
 Kansas, 1998 Marketing Year 1/ 2/

Agricultural Chemical	: Volume Treated	: Applications	: Rate per Application	: Rate per Mkt. Year	: Total Applied
	: Percent	Number	Pounds per 1,000 Bu.		1,000 Lbs
Insecticides:	:				
Aluminum phosphide 3/	: 1.95	1.0	0.14	0.14	

- 1/ Volume handled by Kansas grain storage facilities was 2.0 million bushels.
- 2/ Insufficient reports to publish usage data for Chlorpyrifos-methyl.
- 3/ Amount applied less than 50 pounds.

Oats: Postharvest Chemical Applications  
 Minnesota, 1998 Marketing Year 1/

Agricultural Chemical	: Volume Treated	: Applications	: Rate per Application	: Rate per Mkt. Year	: Total Applied
	: Percent	Number	Pounds per 1,000 Bu.		1,000 Lbs
Insecticides:	:				
Aluminum phosphide	: 5.69	1.0	0.19	0.19	0.7
Malathion	: 0.17	1.0	0.52	0.52	0.1

- 1/ Volume handled by Minnesota grain storage facilities was 62.2 million bushels.

Oats: Postharvest Chemical Applications  
 Pennsylvania, 1998 Marketing Year 1/ 2/

Agricultural Chemical	: Volume Treated	: Applications	: Rate per Application	: Rate per Mkt. Year	: Total Applied
	: Percent	Number	Pounds per 1,000 Bu.		1,000 Lbs
Insecticides:	:				
Malathion 3/	: .92	1.0	0.57	0.57	

- 1/ Volume handled by Pennsylvania grain storage facilities was 4.1 million bushels.
- 2/ Insufficient reports to publish usage data for Aluminum phosphide.
- 3/ Amount applied less than 50 pounds.

Oats: Postharvest Chemical Applications  
 South Dakota, 1998 Marketing Year 1/ 2/

Agricultural Chemical	: Volume Treated	: Applications	: Rate per Application	: Rate per Mkt. Year	: Total Applied
	: Percent	Number	Pounds per 1,000 Bu.		1,000 Lbs
Insecticides:	:				
Aluminum phosphide 3/:	2.41	1.0	0.27	0.27	

- 1/ Volume handled by South Dakota grain storage facilities was 7.4 million bushels.
- 2/ Insufficient reports to publish usage data for Malathion.
- 3/ Amount applied less than 50 pounds.

Oats: Postharvest Chemical Applications  
 Wisconsin, 1998 Marketing Year 1/ 2/

Agricultural Chemical	: Volume Treated	: Applications	: Rate per Application	: Rate per Mkt. Year	: Total Applied
	: Percent	Number	Pounds per 1,000 Bu.		1,000 Lbs
Insecticides:	:				
Malathion 3/:	1.03	1.0	0.16	0.16	
Aluminum phosphide	8.57	1.0	0.11	0.11	0.2

- 1/ Volume handled by Wisconsin grain storage facilities was 19.0 million bushels.
- 2/ Insufficient reports to publish usage data for Calcium propionate and Silicon dioxide.
- 3/ Amount applied less than 50 pounds.

Soybeans: Postharvest Chemical Applications,  
Percent Treated and Total Applied,  
States Surveyed and Total, 1998 Marketing Year

State	Volume Handled	Percent Treated and Total Applied					
		Insecticide	Fungicide	Other Chemical			
	Mil. bu.	Percent	1,000 Lbs	Percent	1,000 Lbs	Percent	1,000 Lbs
AR	100.7			.16	4.7		
IL	561.1			*	*		
IN	365.8						
IA	747.1						
KS	158.2	1.45	0.4				
MN	495.6	*	*				
MO	231.7	*	*				
NE	150.1	*	*				
OH	336.1						
Total	3,146.5	.09	0.5	.01	6.6		

\* Insufficient reports to publish data for this pesticide class.

Soybeans: Postharvest Chemical Applications  
States Surveyed, 1998 Marketing Year 1/ 2/

Agricultural Chemical	Volume Treated	Appli- cations	Rate per Application	Rate per Mkt. Year	Total Applied
	Percent	Number	Pounds per 1,000 Bu.		1,000 Lbs
<b>Insecticides:</b>					
Aluminum phosphide	0.08	1.0	0.17	0.17	0.4
<b>Fungicides:</b>					
Carboxin 3/		1.0	20.31	20.31	3.1
Thiram 3/		1.0	20.31	20.31	3.1

- 1/ Volume handled by grain storage facilities in the 9 States surveyed was 3.1 billion bushels. States included are AR, IL, IN, IA, KS, MN, MO, NE, and OH.
- 2/ Insufficient reports to publish usage data for Malathion as an insecticide and for Metalaxyl as a fungicide.
- 3/ Volume treated less than 0.005 percent.



Soybeans: Postharvest Chemical Applications  
Arkansas, 1998 Marketing Year 1/ 2/

Agricultural Chemical	: Volume Treated	: Appli- cations	: Rate per Application	: Rate per Mkt. Year	: Total Applied
	: Percent	Number	Pounds per 1,000 Bu.		1,000 Lbs
Fungicides:	:	:	:	:	:
Carboxin	: 0.12	1.0	19.17	19.17	2.4
Thiram	: 0.12	1.0	19.17	19.17	2.4

1/ Volume handled by Arkansas grain storage facilities was 100.7 million bushels.

2/ Insufficient reports to publish usage data for Metalaxyl.

Soybeans: Postharvest Chemical Applications  
Kansas, 1998 Marketing Year 1/ 2/

Agricultural Chemical	: Volume Treated	: Appli- cations	: Rate per Application	: Rate per Mkt. Year	: Total Applied
	: Percent	Number	Pounds per 1,000 Bu.		1,000 Lbs
Insecticides:	:	:	:	:	:
Aluminum phosphide	: 1.42	1.0	0.16	0.16	0.4

1/ Volume handled by Kansas grain storage facilities was 158.2 million bushels.

2/ Insufficient reports to publish usage data for Malathion.

Pest Management Practices,  
Percent of Operations Utilizing Practice,  
Oats, 1998 Marketing Year 1/

Practice	States Surveyed							
	IL	IA	KS	MI	MN	ND	OH	OR
-- Percent of Operations --								
Mechanical Devices:								
Aeration controller	47	40	47	36	27	46	40	15
Deep bin sampler	5	8	3	4	2	3	2	13
Grain spreader in bins	29	29	8	16	23	8	33	3
Phosphine pellet dispenser	7	8	47	8	5	11	4	8
Power probe	37	38	24	16	6	5	21	3
Protein analyzer	7	12	13	1	12	82	3	20
Re-circulation fumigation device	1	3	6	1	1	3	2	
Temperature cables in bins	41	34	63	24	28	25	50	2
Cleaning Activities:								
Clean aeration ducts	81	81	81	74	64	78	76	37
Control vegetation around bins	98	97	98	88	95	99	99	85
Core bins after filling	83	77	31	74	45	55	61	14
Fumigate empty bins	61	63	66	40	21	43	68	64
Hose down empty bins	14	10	6	8	11	6	1	18
Pick up spilled grain	97	99	100	98	96	100	100	93
Sweep empty bins	98	94	98	94	87	94	95	90
Other cleaning activities	7	9	3	3	5	31	10	12

Practice	States Surveyed				
	PA	SD	TX	WI	ALL
-- Percent of Operations --					
Mechanical Devices:					
Aeration controller	17	34	34	22	34
Deep bin sampler	1	5	3	5	4
Grain spreader in bins	21	10		17	19
Phosphine pellet dispenser	6	14	17	2	10
Power probe	1	20	10	6	16
Protein analyzer	3	68	15	3	20
Re-circulation fumigation device	3	7	4	2	3
Temperature cables in bins	3	20	20	17	29
Cleaning Activities:					
Clean aeration ducts	38	73	78	57	70
Control vegetation around bins	72	99	90	90	94
Core bins after filling	9	54	23	30	51
Fumigate empty bins	56	51	57	26	45
Hose down empty bins	4	5	12	4	8
Pick up spilled grain	85	100	100	94	97
Sweep empty bins	81	99	97	81	91
Other cleaning activities		7	11	8	9

1/ Descriptions of these items are included in the Terms and Definitions section of this report, on pages 26-28.

Pest Management Practices,  
Percent of Operations Utilizing Practice,  
Oats, 1998 Marketing Year, Spring and Summer

Practice	States Surveyed							
	IL	IA	KS	MI	MN	ND	OH	OR
-- Percent of Operations --								
Inspected for insects:								
Concrete Silos:								
Daily	3	2	6	11	7	2	5	
Twice a week	7	3	4	4		3	1	
Weekly	35	34	35	29	17	14	40	72
Every two weeks	12	12	6	4	15	16	12	
Monthly	41	33	43	27	44	30	26	28
Other	1	7	6	8	2	27	13	
Do not inspect	1	9		17	15	8	3	
Steel Tanks or Bins:								
Daily	5	3	4	12	8	1	9	
Twice a week	6	2	3	5	2	1	4	
Weekly	29	23	23	32	13	17	22	28
Every two weeks	20	19	7	5	19	21	9	
Monthly	33	42	55	33	38	45	47	54
Other	3	6	7	5	6	10	7	13
Do not inspect	4	5	1	8	14	5	2	5
Other Structures:								
Daily	6	7	3	11	9	1	20	18
Twice a week	6	1	3	5	2	2	2	
Weekly	33	29	22	42	22	11	17	25
Every two weeks	10	14	5	8	14	21	3	13
Monthly	34	32	61	14	30	45	27	44
Other	3	6	4	6	3	12	5	
Do not inspect	8	11	2	14	20	8	26	
Measure grain temperature:								
Concrete Silos:								
Daily	3	4	2	8		2	6	
Twice a week	12	6	4	7	4	3	9	
Weekly	33	41	50	20	27	14	39	84
Every two weeks	6	15	8	5	21	7	11	
Monthly	31	19	27	22	7	13	15	
Other	3	2	4	12	4	30	3	
Do not inspect	12	13	5	26	37	31	17	16

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Pest Management Practices,  
Percent of Operations Utilizing Practice,  
Oats, 1998 Marketing Year, Spring and Summer (continued)

Practice	States Surveyed							
	IL	IA	KS	MI	MN	ND	OH	OR
-- Percent of Operations --								
Steel Tanks or Bins:								
Daily	2	4	7	1	3	3		
Twice a week	10	3	4	3	2	1	4	
Weekly	26	19	23	13	10	10	34	9
Every two weeks	8	19	10	5	18	16	9	
Monthly	28	20	39	19	23	24	15	9
Other	2	5	6	6	3	13	3	3
Do not inspect	24	30	18	47	43	33	32	79
Other Structures:								
Daily	2	4	6	1	4	11	18	
Twice a week	9	4	3	2	2			
Weekly	34	23	20	2	10	6	15	13
Every two weeks	5	15	17	3	12	15	4	
Monthly	24	23	46	9	9	24	4	7
Other	3	5	22	4	16	5		
Do not inspect	23	26	17	58	61	33	59	62

Practice	States Surveyed				
	PA	SD	TX	WI	ALL
-- Percent of Operations --					
Inspected for insects:					
Concrete Silos:					
Daily	22	2	5	7	5
Twice a week		6	3	3	3
Weekly	14	5	15	7	27
Every two weeks		22	12	8	11
Monthly	14	25	26	29	33
Other	4	18			8
Do not inspect	46	22	39	46	13
Steel Tanks or Bins:					
Daily	14	1	6	17	7
Twice a week	2	6	1	6	3
Weekly	24	10	22	16	19
Every two weeks	13	17	18	10	15
Monthly	19	42	39	26	39
Other	4	12	2	5	7
Do not inspect	24	12	12	20	10

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Pest Management Practices,  
Percent of Operations Utilizing Practice,  
Oats, 1998 Marketing Year, Spring and Summer (continued)

Practice	States Surveyed				
	PA	SD	TX	WI	ALL
	-- Percent of Operations --				
Other Structures:					
Daily	16	2	5	21	8
Twice a week	2	3		2	2
Weekly	13	14	27	11	20
Every two weeks	2	17		8	12
Monthly	26	37	19	20	34
Other		13	4	3	6
Do not inspect	41	14	45	35	18
Measure grain temperature:					
Concrete Silos:					
Daily		8	4	5	4
Twice a week		4	5		6
Weekly	4	9	26	11	30
Every two weeks		8	13		9
Monthly	8	22	5	21	19
Other	9	14	3	4	7
Do not inspect	79	35	44	59	25
Steel Tanks or Bins:					
Daily		2	3	6	3
Twice a week		4	4	4	3
Weekly	5	10	15	14	16
Every two weeks	6	9	6	10	12
Monthly	18	29	15	9	21
Other	4	12	4	2	5
Do not inspect	67	34	53	55	40
Other Structures:					
Daily				7	3
Twice a week		4		1	3
Weekly	3	13	11	6	12
Every two weeks	2	9	15	2	10
Monthly	2	28	5	6	17
Other	4	13		4	7
Do not inspect	89	33	69	74	48

Pest Management Practices,  
Percent of Operations Utilizing Practice,  
Oats, 1998 Marketing Year, Fall and Winter

Practice	States Surveyed							
	IL	IA	KS	MI	MN	ND	OH	OR
-- Percent of Operations --								
Inspected for insects:								
Concrete Silos:								
Daily	1	2	6	7	5	2	5	
Twice a week	3	3	4	5		3	1	
Weekly	36	31	34	28	19	14	40	57
Every two weeks	13	6	3	4	16	16	12	
Monthly	42	40	43	29	34	30	26	43
Other	4	7	10	9	4	27	13	
Do not inspect	1	11		18	22	8	3	
Steel Tanks or Bins:								
Daily	4	3	4	10	8	1	9	
Twice a week	4	1	3	5	1	1	4	
Weekly	28	19	19	30	11	15	22	25
Every two weeks	21	16	4	6	18	23	9	
Monthly	34	48	59	32	42	51	47	52
Other	5	6	10	8	6	5	7	18
Do not inspect	4	7	1	9	14	4	2	5
Other Structures:								
Daily	6	7	3	11	8	1	20	18
Twice a week	3	1	3	5	1	2	2	
Weekly	30	25	21	42	17	11	17	24
Every two weeks	13	10	7	8	15	22	3	7
Monthly	40	38	58	16	34	52	27	43
Other	3	6	6	2	4	6	5	8
Do not inspect	5	13	2	16	21	6	26	
Measure grain temperature:								
Concrete Silos:								
Daily	4	7	4	8		3	6	
Twice a week	7	5	4	7	4	3	9	
Weekly	36	40	47	20	25	14	39	68
Every two weeks	7	12	3	5	23	5	11	
Monthly	31	21	33	22	9	15	15	16
Other	3	2	2	12	4	27	3	
Do not inspect	12	13	7	26	37	33	17	16

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Pest Management Practices,  
Percent of Operations Utilizing Practice,  
Oats, 1998 Marketing Year, Fall and Winter

Practice	States Surveyed							
	IL	IA	KS	MI	MN	ND	OH	OR
-- Percent of Operations --								
Steel Tanks or Bins:								
Daily	3	5	2	7	3	3		
Twice a week	7	2	3	4	2	1	4	
Weekly	28	19	22	11	8	10	34	6
Every two weeks	9	16	6	4	16	10	9	
Monthly	27	21	43	20	24	31	15	13
Other	2	5	5	5	6	13	3	3
Do not inspect	24	32	19	49	44	32	32	78
Other Structures:								
Daily	3	4	3	6	1	4	11	18
Twice a week	4	3			2	2	2	
Weekly	36	21	20	2	8	6	15	
Every two weeks	7	12	10	3	12	9	4	6
Monthly	24	27	50	9	11	31	4	14
Other	3	5			6	16	5	
Do not inspect	23	28	17	80	60	32	59	62

Practice	States Surveyed				
	PA	SD	TX	WI	ALL
-- Percent of Operations --					
Inspected for insects:					
Concrete Silos:					
Daily	23	2	3	7	4
Twice a week		6	3	3	3
Weekly	9	5	8	5	26
Every two weeks	4	22	12	10	10
Monthly	9	25	25	29	33
Other	9	17	10		10
Do not inspect	46	23	39	46	14
Steel Tanks or Bins:					
Daily	14	1	5	16	7
Twice a week	2	6	1	6	3
Weekly	23	10	21	13	17
Every two weeks	13	17	12	7	14
Monthly	18	40	41	30	41
Other	12	12	4	5	7
Do not inspect	18	14	16	23	11

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Pest Management Practices,  
Percent of Operations Utilizing Practice,  
Oats, 1998 Marketing Year, Fall and Winter (continued)

Practice	States Surveyed				
	PA	SD	TX	WI	ALL
	-- Percent of Operations --				
Other Structures:					
Daily	16	2		21	8
Twice a week	2	3		2	2
Weekly	13	14	16	12	18
Every two weeks	2	17		1	12
Monthly	21	37	19	20	36
Other	2	13	4	3	5
Do not inspect	44	14	61	41	19
Measure grain temperature:					
Concrete Silos:					
Daily		8	4	5	5
Twice a week		4	6		5
Weekly		9	15	7	30
Every two weeks	4	8	8	2	8
Monthly	8	22	21	24	21
Other	9	14	3	4	6
Do not inspect	79	35	43	58	25
Steel Tanks or Bins:					
Daily		2	5	6	3
Twice a week		4	4	4	3
Weekly	5	10	8	12	15
Every two weeks	6	9	2	9	11
Monthly	18	29	22	11	23
Other	4	12	5	2	6
Do not inspect	67	34	54	56	39
Other Structures:					
Daily				8	3
Twice a week		4		1	2
Weekly	3	13	11	7	11
Every two weeks	2	9			8
Monthly	2	28	20	6	20
Other	4	13		4	7
Do not inspect	89	33	69	74	49



Pest Management Practices,  
Strategies Used in Deciding When to Fumigate Grain  
Oats, 1998 Marketing Year

Practice	States Surveyed							
	IL	IA	KS	MI	MN	ND	OH	OR
	-- Percent of Operations --							
Preset Calendar Date	3	5	5	7			18	
Bin Samples	20	13	48	11	54	45	25	43
Combined with other Handling Operation	34	12	2	7	3	2	7	26
Insect Trap Counts	3	64	9	3	8			
Visual Grain Inspection	40	6	36	72	32	47	42	31
Other					3	6	8	

Practice	States Surveyed				
	PA	SD	TX	WI	ALL
	-- Percent of Operations --				
Preset Calendar Date			11	12	4
Bin Samples	6	51	46	19	37
Combined with other Handling Operation	19	4	7	3	7
Insect Trap Counts					2
Visual Grain Inspection	62	40	32	61	46
Other	13	5	4	5	4

Pest Management Practices,  
Percent of Operations Utilizing Practice,  
Soybeans, 1998 Marketing Year 1/

Practice	States Surveyed				
	AR	IL	IN	IA	KS
-- Percent of Operations --					
Mechanical Devices:					
Aeration controller	38	44	40	39	49
Deep bin sampler	11	3	2	4	13
Grain spreader in bins	16	27	12	33	7
Phosphine pellet dispenser	16	5	4	6	44
Power probe	42	54	47	42	19
Protein analyzer		1	2	10	14
Re-circulation fumigation device	5	2	8	2	5
Temperature cables in bins	13	59	34	40	67
Cleaning Activities:					
Clean aeration ducts	69	91	81	73	81
Control vegetation around bins	96	98	99	100	97
Core bins after filling	62	89	69	77	50
Fumigate empty bins	67	50	57	60	68
Hose down empty bins	30	11	7	9	18
Pick up spilled grain	97	98	100	100	99
Sweep empty bins	92	99	97	98	93
Other cleaning activities		8	7	11	10

Practice	States Surveyed				
	MN	MO	NE	OH	ALL
-- Percent of Operations --					
Mechanical Devices:					
Aeration controller	45	37	44	34	41
Deep bin sampler	5	7	12	4	6
Grain spreader in bins	30	21	25	26	22
Phosphine pellet dispenser	5	9	11	6	11
Power probe	13	16	55	28	36
Protein analyzer	28	3	8	2	7
Re-circulation fumigation device	1	5	3	1	3
Temperature cables in bins	46	20	53	69	49
Cleaning Activities:					
Clean aeration ducts	87	82	84	89	83
Control vegetation around bins	99	99	99	100	99
Core bins after filling	71	72	63	75	72
Fumigate empty bins	26	62	51	55	55
Hose down empty bins	7	14	4	1	10
Pick up spilled grain	99	99	98	100	99
Sweep empty bins	90	96	100	100	97
Other cleaning activities	8	3	10	8	8

1/ Definitions of these items are included in the Terms and Definitions section of this report, on pages 26-28.

Pest Management Practices,  
Percent of Operations Utilizing Practice,  
Soybeans, 1998 Marketing Year, Spring and Summer

Practice	States Surveyed				
	AR	IL	IN	IA	KS
-- Percent of Operations --					
Inspected for insects:					
Concrete Silos:					
Daily	5	2	4	3	3
Twice a week	22	8	2	2	2
Weekly	34	38	23	25	31
Every two weeks		20	13	13	18
Monthly	24	24	30	43	38
Other	6	6	12	8	7
Do not inspect	9	2	16	6	1
Steel Tanks or Bins:					
Daily	2	2	12	3	2
Twice a week	7	6	2	2	
Weekly	33	40	18	23	24
Every two weeks	4	20	10	17	6
Monthly	34	24	35	39	48
Other	5	6	10	11	16
Do not inspect	15	2	13	5	4
Other Structures:					
Daily	3	3	17	4	1
Twice a week	21	7	1	3	1
Weekly	57	43	10	26	21
Every two weeks	4	18	11	13	3
Monthly	7	17	28	33	44
Other		10	20	14	19
Do not inspect	8	2	13	7	11
Measure grain temperature:					
Concrete Silos:					
Daily	31	8	6	5	2
Twice a week	22	7	3	6	7
Weekly		37	24	41	53
Every two weeks		15	4	13	11
Monthly	4	14	21	13	18
Other	16	1	18	3	2
Do not inspect	27	18	24	19	7

--continued

Pest Management Practices,  
Percent of Operations Utilizing Practice,  
Soybeans, 1998 Marketing Year, Spring and Summer (continued)

Practice	States Surveyed				
	AR	IL	IN	IA	KS
	-- Percent of Operations --				
Steel Tanks or Bins:					
Daily	11	8	10	3	
Twice a week	6	6	3	3	4
Weekly	21	37	14	25	29
Every two weeks	9	15	5	18	6
Monthly	29	17	17	16	41
Other	1	1	16	3	2
Do not inspect	23	16	35	32	18
Other Structures:					
Daily	3	2		1	
Twice a week	17	9	3	4	2
Weekly	42	40	17	25	29
Every two weeks		17	5	19	6
Monthly	4	11	15	22	35
Other		2	13	1	
Do not inspect	34	19	47	28	28

Practice	States Surveyed				
	MN	MO	NE	OH	ALL
	-- Percent of Operations --				
Inspected for insects:					
Concrete Silos:					
Daily	15	7	7	7	5
Twice a week	2	10	7	5	5
Weekly	24	33	30	39	32
Every two weeks	9	13	9	10	14
Monthly	41	28	42	22	31
Other	5	4	2	13	8
Do not inspect	4	5	3	4	5
Steel Tanks or Bins:					
Daily	3	3	4	11	5
Twice a week	4	8	6	6	4
Weekly	18	22	30	29	27
Every two weeks	27	22	17	11	16
Monthly	35	31	38	29	33
Other	2	4	2	9	8
Do not inspect	11	10	3	5	7

--continued

Pest Management Practices,  
Percent of Operations Utilizing Practice,  
Soybeans, 1998 Marketing Year, Spring and Summer (continued)

Practice	States Surveyed				
	MN	MO	NE	OH	ALL
-- Percent of Operations --					
Other Structures:					
Daily	4	10	8	1	4
Twice a week	2	9	10	7	5
Weekly	28	40	27	42	32
Every two weeks	23	27	24		13
Monthly	30	5	26	44	30
Other	2				9
Do not inspect	11	9	5	6	7
Measure grain temperature:					
Concrete Silos:					
Daily	7	7	8	6	7
Twice a week	5	11	7	23	9
Weekly	35	38	41	41	38
Every two weeks	11	7	20	7	11
Monthly	16	16	19	11	15
Other	5	5	1	7	5
Do not inspect	21	16	4	5	14
Steel Tanks or Bins:					
Daily		3	3	5	5
Twice a week	2	6	4	18	6
Weekly	12	17	32	31	25
Every two weeks	21	4	20	7	12
Monthly	37	31	16	12	22
Other	2	3	3	10	5
Do not inspect	26	36	22	17	25
Other Structures:					
Daily		10	7	3	2
Twice a week	4	4	8	11	6
Weekly	14	14	28	35	28
Every two weeks	25	5	24	3	14
Monthly	13	3	12	13	18
Other	4		4	2	3
Do not inspect	40	64	17	33	29

Pest Management Practices,  
Percent of Operations Utilizing Practice,  
Soybeans, 1998 Marketing Year, Fall and Winter

Practice	States Surveyed				
	AR	IL	IN	IA	KS
-- Percent of Operations --					
Inspected for insects:					
Concrete Silos:					
Daily	5	4	5	3	3
Twice a week		5	1	2	2
Weekly	24	37	20	22	26
Every two weeks	14	20	8	8	14
Monthly	13	24	34	48	44
Other	5	6	19	8	9
Do not inspect	39	4	13	9	2
Steel Tanks or Bins:					
Daily	2	4	12	3	2
Twice a week	6	4	1	1	
Weekly	32	37	19	18	19
Every two weeks	7	19	7	13	5
Monthly	38	26	36	48	52
Other	3	6	15	10	17
Do not inspect	12	4	10	7	5
Other Structures:					
Daily	3	4	17	4	1
Twice a week	21	1	1	3	1
Weekly	47	37	9	23	17
Every two weeks	14	22	8	11	4
Monthly	7	22	34	35	44
Other		10	20	13	21
Do not inspect	8	4	11	11	12
Measure grain temperature:					
Concrete Silos:					
Daily	34	14	7	5	2
Twice a week	19	3	2	6	6
Weekly		35	22	38	50
Every two weeks		14	4	10	6
Monthly	4	14	22	19	25
Other	16	1	18	3	2
Do not inspect	27	19	25	19	9

--continued

Pest Management Practices,  
Percent of Operations Utilizing Practice,  
Soybeans, 1998 Marketing Year, Fall and Winter (continued)

Practice	States Surveyed				
	AR	IL	IN	IA	KS
	-- Percent of Operations --				
Steel Tanks or Bins:					
Daily	11	14	11	4	
Twice a week	9	4	2	2	4
Weekly	21	34	16	24	26
Every two weeks	11	13	5	16	5
Monthly	31	17	17	21	45
Other	1	1	14	3	1
Do not inspect	16	17	35	30	19
Other Structures:					
Daily	7	4	2	1	
Twice a week	13	2	4	2	1
Weekly	42	38	16	30	26
Every two weeks		21	5	15	3
Monthly	4	14	15	25	41
Other		2	13	1	
Do not inspect	34	19	45	26	29

Practice	States Surveyed				
	MN	MO	NE	OH	ALL
	-- Percent of Operations --				
Inspected for insects:					
Concrete Silos:					
Daily	14	8	7	7	5
Twice a week	4	4	6	5	4
Weekly	20	37	28	37	29
Every two weeks	10	7	4	10	12
Monthly	42	25	44	25	33
Other	6	12	2	12	10
Do not inspect	4	7	9	4	7
Steel Tanks or Bins:					
Daily	2	2	3	11	5
Twice a week	4	6	6	3	3
Weekly	16	18	28	30	24
Every two weeks	25	20	13	12	14
Monthly	37	36	41	30	37
Other	2	7	3	9	9
Do not inspect	14	11	6	5	8

--continued

Pest Management Practices,  
Percent of Operations Utilizing Practice,  
Soybeans, 1998 Marketing Year, Fall and Winter (continued)

Practice	States Surveyed				
	MN	MO	NE	OH	ALL
-- Percent of Operations --					
Other Structures:					
Daily	3	10	8	1	5
Twice a week	2	5	8	7	3
Weekly	25	5	26	37	25
Every two weeks	26	16	15	2	13
Monthly	29	51	36	48	35
Other	2	4	2		10
Do not inspect	13	9	5	5	9
Measure grain temperature:					
Concrete Silos:					
Daily	6	8	8	6	8
Twice a week	3	12	9	22	8
Weekly	33	38	37	41	36
Every two weeks	14	5	16	8	10
Monthly	20	16	25	11	18
Other	5	5	1	7	5
Do not inspect	19	16	4	5	15
Steel Tanks or Bins:					
Daily	1	2	3	5	6
Twice a week	2	5	5	14	5
Weekly	13	18	28	32	25
Every two weeks	19	4	18	10	11
Monthly	37	35	20	12	24
Other	3	3	3	10	5
Do not inspect	25	33	23	17	24
Other Structures:					
Daily			7	3	2
Twice a week	3	4	10	7	4
Weekly	15	20	30	35	28
Every two weeks	24	2	13	8	13
Monthly	13	34	21	13	22
Other	5		2	2	2
Do not inspect	40	40	17	32	29



Pest Management Practices,  
Strategies Used in Deciding When to Fumigate Grain  
Soybeans, 1998 Marketing Year

Practice	States Surveyed				
	AR	IL	IN	IA	KS
	-- Percent of Operations --				
Preset calendar date	16	8	5	6	2
Bin samples	66	26	16	10	31
Combined with other handling Operations	7	5	18	9	18
Insect trap counts		1	10	2	1
Visual grain inspection	11	57	38	65	48
Other		3	13	8	

Practice	States Surveyed				
	MN	MO	NE	OH	ALL
	-- Percent of Operations --				
Preset calendar date		11	10	35	9
Bin samples	25	31	50	30	31
Combined with other handling Operations	9	7	10	5	11
Insect trap counts	5				1
Visual grain inspection	59	51	28	28	46
Other	2		2	2	2

**Survey Procedures:** Operations chosen from the NASS List Sampling Frame were known to or expected to provide off-farm storage for oats and soybeans. The sample was selected with probability proportional to size in terms of the amount of oats and soybeans reported by the operation on one of NASS's quarterly Grain Stocks Surveys in 1998.

**Estimation Procedures:** The chemical applications data, reported by product name or trade name were reviewed within State and across States for reasonableness and consistency. This review compared reported data with manufacturer's recommendations and with data from other operations using the same product. Following this review, product information was converted to active ingredient level. The chemical usage estimates in this publication are of those active ingredients.

Detailed data within a table may not multiply across or add down due to independent rounding of the published values.

**Reliability:** The probability nature of the survey provides for expansion of data so estimates are statistically representative of chemical use on the targeted commodities in the surveyed States. The reliability of these survey results are affected by sampling variability and nonsampling errors.

Nonsampling errors are errors that 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 between collection and publication. In this survey, procedures and analysis were carried out in a consistent and orderly manner to minimize the occurrence of these types of errors.

Variability for estimates of volume of the commodity handled will be higher than the variability for estimates of application rates. This is because application rates have a narrower range of responses and the manufacturer's recommended rates are generally followed.

Sampling variability of the estimates also differs by chemical and crop. 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 aluminum phosphide on oats in Minnesota, will exhibit less variability than a rarely used or reported product.

## 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.

**Aeration Controller:** An automatic (usually computer-based) system that determines the optimum running time (considering humidity and temperature) for aeration fans on the grain bins. They can usually be set for drying or storage mode.

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

**Application Rates:** The application rates refer to the average number of pounds of a pesticide active ingredient applied to a volume of product. Rate per application is the average number of pounds applied in one application. Rate per marketing year is the average number of pounds applied counting multiple applications. Number of applications is the average number of times a treated volume receives a specific agricultural chemical.

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

**Core bins after filling:** When grain is placed into a bin, it is usually filled from the top. The grain forms a cone as it fills the bin. Because grain contains other things (including broken pieces of grain), smaller particles (called fines) tend to concentrate in the center of the bin. This finer material compacts, restricting airflow which in turn affects grain temperatures and thus pests. For this reason, it is recommended that a portion of grain is extracted from the bottom center of the bin. This core can then be reloaded onto the top and spread over the surface to distribute the fines evenly.

**Deep bin sampler:** Usually a vacuum type device that allows one to reach deeply into a grain bin and sample grain that is normally out of reach to typical probe samplers.

**Fumigant:** A substance or mixture of substances which produce a gas vapor, fume or smoke intended to destroy insects, rodents, or bacteria.

**Grain spreader:** When grain is loaded into the grain bin, it can first be put through a spreader which swings the grain out from the fall line and fills the bin uniformly rather than forming a cone in the center of the bin.

**Marketing year:** A marketing year refers to the period immediately following harvest of the crop through the marketing or disposition of the crop. The marketing year for oats was July 1, 1998 to June 30, 1999, and September 1, 1998 to August 31, 1999 for soybeans.

**Pesticides:** As defined by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), pesticides 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.

**Phosphine pellet dispenser:** Manually or automatically dispenses phosphine pellets to a stream of grain as it is being loaded.

**Postharvest:** After the commodity is harvested from the field, any subsequent activity is termed postharvest. Postharvest chemical usage refers to chemical applications after the commodity is taken from the field or orchard.

**Power probe:** A fully integrated mechanized system for sampling stationary lots of grain in trucks or similar conveyance. It obtains a representative sample by inserting a probe-like device into grain, opening the probe to allow grain to enter, closing, and then the sample is pneumatically withdrawn from the probe.

**Processor:** Processors actually change the form of the commodity. These firms may have storage facilities as well.

**Protein analyzer:** Usually infrared analyzers that can, within a matter of minutes, determine the composition of grain. Values obtained can include protein, oil, starch content, moisture content and kernel density.

**Re-circulation fumigation device:** A fan that is combined with PVC pipe on the outside of a grain bin. The PVC runs from the top down the sides, through the fan and into the bottom of the grain bin. Rather than probing fumigant pellets into the grain mass from the surface of the grain, you can use a much lower concentration of fumigant and place the pellets in the PVC pipe from outside of the grain bin. Advantages include using less chemical, increased worker safety, and more uniform distribution of the gas since the fans force the fumigant throughout the grain mass.

**Temperature cables:** Cables running from top to bottom in grain bin that automatically determine grain temperature and output this information to a central system.

**Terminal elevator:** An elevator where large amounts of grain are brought for sale and distribution. Grain usually leaves these facilities by rail or barge.

**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.

**Volume Handled:** The volume of a commodity handled by the market segment.  
 In this release, it is the total amount of a commodity that passed through the firms summarized in the particular table.

**Volume treated:** This amount represents the percentage of the volume handled which received one or more applications of a specific agricultural chemical. This report does not contain total quantity treatments. However, total quantity treatments can be calculated by multiplying the total volume handled by the percent of volume treated and the average number of applications.

### Trade Names, Common Names, and Classes

The following is a list of common names, associated classes and trade names 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 the data. Pre-mixes are not cataloged. The list may not be complete for all postharvest chemicals used on oats and soybeans, and NASS does not mean to imply use of any specific trade name.

Class :	Common Name	:	Trade Name
I	Aluminum phosphide		several
I	Bicycloheptene		Virchem Thirty-Four
F	Calcium propionate		Calcium propionate
F	Captan		Captan
I	Carbon dioxide		Carbon dioxide
F	Carboxin		Vitavax
O	Chloropicrin		Larvacide
I	Chlorpyrifos		Lorsban, Dursban
I	Chlorpyrifos-methyl		Reldan
I	Cyfluthrin		Tempo 2
I	D-trans-allethrin		Virchem Thirty-Four
F	Difenoconazole		Dividend
F	Fludioxonil		Maxim
F	Imazilil		Flo-Pro
I	Imidacloprid		Gancho
I	Lindane		Lindane
I	Malathion		several
F	Metalaxyl		Apron
I	Methyl bromide		several
I	Methoxychlor		several
I	Petroleum distillate		several
I	Piperonyl butoxide		several
I	Pirimiphos-methyl		Actellic
F	Propionic acid		Tenox P
I	Pyrethrins		several
I	Silica gel		Protect-it
I	Silicon dioxide		Diatomaceous Earth, Insect-Away
F	Tebuconazole		Thiram
F	Thiram		Vitavax, Thiram



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Washington, D.C. 20250-2000  
202-720-7017

# 1999 OATS POSTHARVEST CHEMICAL USE SURVEY

Form Approved  
O.M.B. Number 0535-0218  
Approval Expires 07/31/00  
Project Code 143

VERSION	POID	SUBT.	T-TYPE	TABLE	LINE
2	_____	___	0	000	00

CONTACT RECORD		
DATE	TIME	NOTES

RESPONSE CODES	
3 - COMPLETED	OFFICE USE 001
4 - SCREENOUT	
5 - NO OATS HANDLED/ RECEIVED	
8 - REFUSAL	
9 - INACCESSIBLE	
OPTIONAL	002

**INTRODUCTION**  
[Introduce yourself, and ask for the operator. Rephrase in your own words.]

We are collecting information on chemical use and need your help to make the information as accurate as possible. Authority for collection of information on the Oats Postharvest Chemical Use Survey is Title 7, Section 2204 of the U.S. Code. This information will be used for analysis and to compile and publish estimates for your state and the United States. Response to this survey is confidential and voluntary.

We encourage you to refer to your operation records during the interview.

BEGINNING TIME [MILITARY] ..... 003

Name \_\_\_\_\_  
Address \_\_\_\_\_  
Phone (\_\_\_\_) \_\_\_\_\_

[Name, address and partners verified and updated if necessary.]

1. Did this operation (as listed on the label) handle/receive any oats from July 1, 1998 to June 30, 1999?

YES - [Go to page 3.]

NO - [Go to page 2.]

ADJUSTMENT FACTOR  
005 \_\_\_\_\_



**A QUANTITY HANDLED A**

Now I would like to ask about the oats handled/received from July 1, 1998 to June 30, 1999.

Please use your records to help us get an accurate record of oat receipts.

1. What was the total quantity of the oats handled/received from July 1, 1998 to June 30, 1999 on this operation? .....

QUANTITY

200
-----



1 BUSHEL (32 lbs)	If unit equals "8", enter
4 SHORT TON (2,000 lbs)	
5 CWT. (100 lbs.)	
6 POUNDS	
7 METRIC TON (2,204.6 lbs)	
8 OTHER	
UNIT	POUNDS/UNIT
201	202

a. Of the item 1 oats, how many **DID NOT** receive postharvest chemical applications while in storage, on the ground, in barges, ships, railcars or on trucks? .....

QUANTITY

206
-----

PERCENT OF TOTAL NOT TREATED

OR

207
-----

**ENUMERATOR NOTE:** [If no postharvest chemicals were applied go to Section C, page 6.  
If postharvest chemicals were applied, go to page 4.]

**COMPLETION CODE for CHEMICAL EDIT TABLE**

1 - Incomplete / Refusal	300
3 - Valid Zero	



**B POSTHARVEST CHEMICAL TREATMENTS APPLIED B**

Now I have some questions about postharvest chemical data on oats handled, stored or processed by your operation from July 1, 1998 to June 30, 1999. I will be asking for five things: product used, quantity treated, total amount of product applied, and timing and method of application. Please use your records to answer the questions as accurately as possible and to help make sure we do not miss any products used. Include oats treated while in storage or on the ground or in barges, ships, rail cars or on trucks by this operation.

OFFICE USE  
LINES IN TABLE

T-TYPE	TABLE	LINE	399
3	001	99	

STORAGE CODES FOR COLUMN 2	
5	In Bound
6	During Binning
7	While Stored
8	Out Bound

NOTES	LINE	1 What product was applied? <i>(In Respondent Booklet)</i>		2 When was this product used? <i>[Enter code from above.]</i>	3 What was the total quantity of oats treated with this chemical <i>(in column 1)?</i>
		a COMMON OR TRADE NAME	b PRODUCT CODE		
	01		302	303	304 . __
	02		302	303	304 . __
	03		302	303	304 . __
	04		302	303	304 . __
	05		302	303	304 . __
	06		302	303	304 . __
	07		302	303	304 . __
	08		302	303	304 . __
	09		302	303	304 . __
	10		302	303	304 . __

*[For pesticides not listed in Respondent Booklet, specify--]*

LINE NO.	EPA No. or Trade name and Formulation	Form Purchased (Liquid or Dry)	Where Purchased <i>[Ask only if EPA No. cannot be reported.]</i>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

**B POSTHARVEST CHEMICAL TREATMENTS APPLIED**

**B**

**UNIT CODES FOR COLUMN 4**  
 1 - BUSHEL (32 lbs)  
 4 - SHORT TON (2,000 lbs)  
 5 - CWT. (100 lbs.)  
 6 - POUNDS  
 7 - METRIC TON (2,204.6 lbs)  
 8 - OTHER

**UNIT CODES FOR COLUMN 7**  
 1 POUNDS  
 12 GALLONS  
 13 QUARTS  
 14 PINTS  
 15 OUNCES  
 30 GRAMS  
 40 KILOGRAMS  
 41 LITERS  
 45 PELLETS  
 46 TABLETS  
 50 OTHER (Specify \_\_\_\_\_)

**APPLICATION CODES FOR COLUMN 8**  
 3 - DIRECT SPRAY  
 5 - TOP DRESS  
 7 - MIXING PELLETS/TABLETS  
 9 - DIRECT POWDERING  
 10 - RE-CIRCULATION  
 11 - OTHER (Specify \_\_\_\_\_)

LINE	4	5	6	7	8
	[Enter unit code from above.]	If column 4 unit equals "8", enter pounds per unit.	What was the total amount of formulated product applied to the (column 3) amount of oats?	[Enter unit code from above.]	What was the method used to apply this product?  CODE
01	305	306	307	308	309
02	305	306	307	308	309
03	305	306	307	308	309
04	305	306	307	308	309
05	305	306	307	308	309
06	305	306	307	308	309
07	305	306	307	308	309
08	305	306	307	308	309
09	305	306	307	308	309
10	305	306	307	308	309

Enumerator Notes:

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C

PEST MANAGEMENT PRACTICES

C

Now I have some questions about pest management practices you may have used at your facilities. Include all grains handled.

T-TYPE	TABLE	LINE
0	000	00

1. Did you use a-

a. power probe?

YES - [Enter code 1 and continue.]

NO .....

CODE

650

b. aeration controller?

YES - [Enter code 1 and continue.]

NO .....

651

c. phosphine pellet dispenser?

YES - [Enter code 1 and continue.]

NO .....

652

d. temperature cable in bins?

YES - [Enter code 1 and continue.]

NO .....

653

e. grain spreader in bins?

YES - [Enter code 1 and continue.]

NO .....

654

f. re-circulation fumigation device?

YES - [Enter code 1 and continue.]

NO .....

655

g. deep bin sampler?

YES - [Enter code 1 and continue.]

NO .....

656

h. protein analyzer?

YES - [Enter code 1 and continue.]

NO .....

657

2. How often is your grain inspected for insects in your (concrete silos, steel tanks or bins, or other structures) (including wood bins) during the spring/summer and fall/winter months?

	SPRING/SUMMER	FALL/WINTER															
Concrete Silos. ....	658	659	<table border="1"> <tr><td>1</td><td>DAILY</td></tr> <tr><td>2</td><td>TWICE A WEEK</td></tr> <tr><td>3</td><td>WEEKLY</td></tr> <tr><td>4</td><td>EVERY 2 WEEKS</td></tr> <tr><td>5</td><td>MONTHLY</td></tr> <tr><td>6</td><td>OTHER - (Specify _____)</td></tr> <tr><td>7</td><td>DO NOT MONITOR</td></tr> </table>	1	DAILY	2	TWICE A WEEK	3	WEEKLY	4	EVERY 2 WEEKS	5	MONTHLY	6	OTHER - (Specify _____)	7	DO NOT MONITOR
1	DAILY																
2	TWICE A WEEK																
3	WEEKLY																
4	EVERY 2 WEEKS																
5	MONTHLY																
6	OTHER - (Specify _____)																
7	DO NOT MONITOR																
Steel Tanks or Bins. ....	660	661															
Other Structures (Include wood bins.) .....	662	663															

3. How often do you measure grain temperature in your (concrete silos, steel tanks or bins, or other structures) (including wood bins) during the spring/summer and fall/winter months?

	SPRING/SUMMER	FALL/WINTER															
Concrete Silos. ....	664	665	<table border="1"> <tr><td>1</td><td>DAILY</td></tr> <tr><td>2</td><td>TWICE A WEEK</td></tr> <tr><td>3</td><td>WEEKLY</td></tr> <tr><td>4</td><td>EVERY 2 WEEKS</td></tr> <tr><td>5</td><td>MONTHLY</td></tr> <tr><td>6</td><td>OTHER - (Specify _____)</td></tr> <tr><td>7</td><td>DO NOT MONITOR</td></tr> </table>	1	DAILY	2	TWICE A WEEK	3	WEEKLY	4	EVERY 2 WEEKS	5	MONTHLY	6	OTHER - (Specify _____)	7	DO NOT MONITOR
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6	OTHER - (Specify _____)																
7	DO NOT MONITOR																
Steel Tanks or Bins. ....	666	667															
Other Structures (Include wood bins.) .....	668	669															

**C PEST MANAGEMENT PRACTICES C**

4. Which practices do you use at storage facilities--

Did you--

- a. sweep empty bins?  YES - [Enter code 1 and continue.]  NO ..... 

CODE 670
-------------
- b. hose down empty bins?  YES - [Enter code 1 and continue.]  NO ..... 

671
-----
- c. fumigate empty bins?  YES - [Enter code 1 and continue.]  NO ..... 

672
-----
- d. pick up spilled grain?  YES - [Enter code 1 and continue.]  NO ..... 

673
-----
- e. control vegetation around bins?  YES - [Enter code 1 and continue.]  NO ..... 

674
-----
- f. clean aeration ducts?  YES - [Enter code 1 and continue.]  NO ..... 

675
-----
- g. core bins after filling?  YES - [Enter code 1 and continue.]  NO ..... 

676
-----

5. Did you do any other cleaning activities besides the ones listed above to your storage facilities?

- YES - [Enter code 1 and continue.]  NO - [Go to item 6.] ..... 

677
-----

a. What did you do? [Record responses below.]

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

OFFICE USE
678
679
680
681

6. Did you fumigate grain?

- YES - [Enter code 1 and continue.]  NO - [Go to Conclusion.] ... 

CODE 682
-------------

a. What was the strategy(ies) you used to decide when to fumigate grain? (Enter up to two strategies.)

- |   |   |
|---|---|
| 1 | PRESET CALENDAR DATE                    |
| 2 | BIN SAMPLES                             |
| 3 | COMBINED WITH OTHER HANDLING OPERATIONS |
| 4 | INSECT TRAP COUNTS                      |
| 5 | VISUAL GRAIN INSPECTION                 |
| 6 | OTHER - (Describe _____)                |

683
684

**COMPLETION CODE for  
PEST MANAGEMENT SECTION**

1	Incomplete/Refusal	500
---	--------------------	-----

## CONCLUSION

### SURVEY PUBLICATIONS

That completes the survey. Would you like to receive a free copy of the results when they are published?

YES - [Enter code 1.]     NO .....

CODE

023
-----

*[Thank the respondent then review this questionnaire.]*

### RECORDS USE

Did respondent use operation records to report chemical data?

YES - [Enter code 1.]     NO .....

024
-----

ENDING TIME [MILITARY] .....

025
-----

OFFICE USE -  
TIME IN HOURS

026
-----

### SUPPLEMENTS USED

Record the total number of pesticide supplements used to complete this interview. ....

NUMBER

028
-----

### RESPONDENT

- |   |                             |
|---|-----------------------------|
| 1 | OPERATOR/MANAGER OR PARTNER |
| 2 | BOOKKEEPER                  |
| 3 | OTHER                       |

.....

CODE

029
-----

Respondent's name:

\_\_\_\_\_

(Phone)

\_\_\_\_\_

ENUMERATOR .....

ENUMERATOR ID

030
-----

DATE .....

MM DD YY

031
-----

OFFICE USE  
EVALUATION

032
-----

## Report Features

Released March 15, 2000, by the National Agricultural Statistics Service (NASS), Agricultural Statistics Board, U.S. Department of Agriculture. For information on "Agricultural Chemical Usage" call (202) 720-6146, office hours 7:30 a.m. to 4:00 p.m. ET.

The next **"Agricultural Chemical Usage: Postharvest Applications"** will be released during the spring of 2001. This report will cover the use of postharvest chemicals used on peanuts and rice during the 1999 marketing year.

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

Mark Aitken, Environmental Statistician	(202) 720-9525
Norman Bennett, Head, Environmental and Demographics Section	(202) 720-0684
Linda Hutton, Chief, Environmental, Economics, and Demographics Branch	(202) 720-6146

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