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Agricultural Chemical Usage Postharvest Applications - Corn and Soybeans

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Postharvest Chemical Use Estimates for Corn and Soybeans

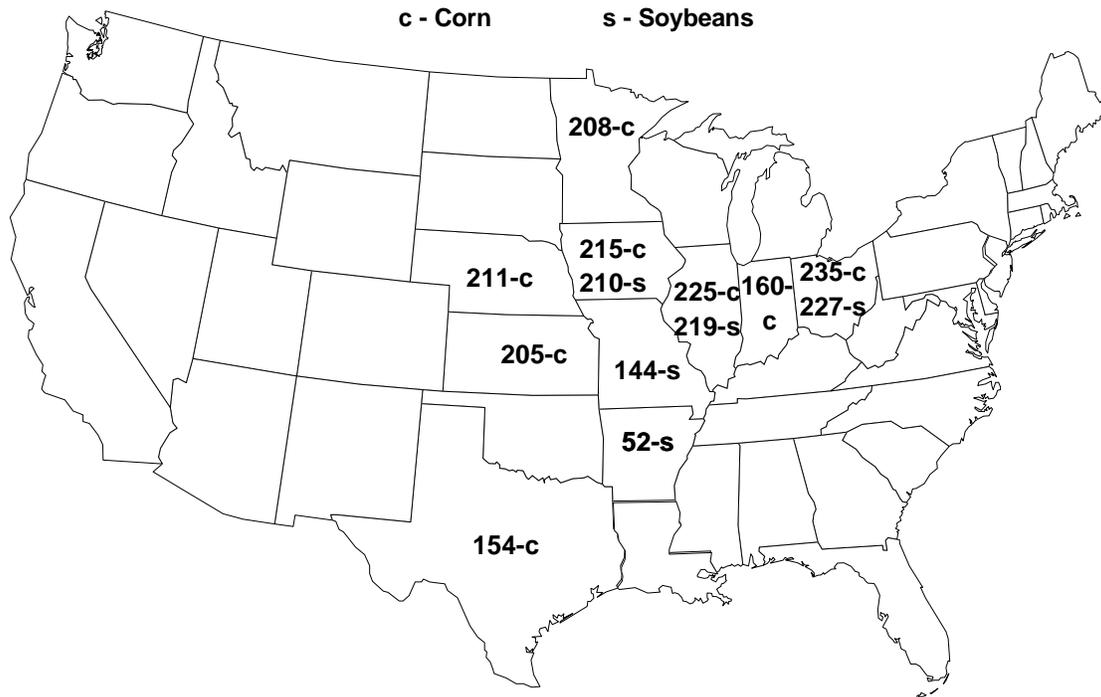
Overview: The agricultural chemical use estimates in this report are based on data compiled from the 2003 Postharvest Chemical Use Survey. The Postharvest Survey was conducted for corn and soybeans in the summer of 2003, covering the 2002 crop. All results refer to pesticide applications made at off-farm storage facilities after the crops were harvested. These applications were made at the grain storage facility or the processing facility. On-farm postharvest applications were beyond the scope of this survey. The time frame for these applications was September 1, 2002 to August 31, 2003.

The table below depicts the survey coverage for the 2002-2003 marketing year for corn and soybeans. The table includes the number of program States and number of reports summarized. The U.S. map below the table depicts graphically the number of summarized reports for each State in the survey.

Agricultural Chemical Use Survey Coverage, 2002-2003 Marketing Year

Crop	Number of Program States	Number of Reports Summarized
Corn	8	1613
Soybeans	9	1548

Corn and Soybean Postharvest Number of Positive Usable Reports, 2002 Marketing Year



Highlights

CORN: Corn storage operations in eight States were surveyed following the 2002-2003 marketing year. These States accounted for 77 percent of the total U.S. corn production. States surveyed for storage do not necessarily correspond to major corn producing States.

Commonly Used Active Ingredients: The primary postharvest chemicals used on 2002 crop year corn stored off-farm were aluminum phosphide and silicon dioxide, based on percent of total pounds applied. Although aluminum phosphide is commonly referred to as a fumigant, it is used to kill insects, insect larvae, and mites and is classified as an insecticide by the Environmental Protection Agency (EPA). Silicon dioxide is also an insecticide.

Data for total pounds of insecticides applied and percent of corn treated were not able to be published for Minnesota and Ohio due to National Agricultural Statistics Service (NASS) confidentiality and disclosure restrictions.

There were insufficient reports to publish state level fungicide usage on corn for any of the eight program States. Total pounds applied, rates, and percent treated for fungicides were tabulated and published at the U.S. level as a sum of the program States. States included in this survey were Illinois, Indiana, Iowa, Kansas, Minnesota, Nebraska, Ohio, and Texas.

SOYBEANS: Soybean storage operations in nine States were surveyed following the 2002-2003 marketing year. These States surveyed accounted for 78 percent of the total U.S. soybean production. States surveyed for storage do not necessarily correspond to major soybean producing States.

Commonly Used Active Ingredients: The primary postharvest chemicals used on 2002 crop year soybean stored off-farm were carboxin and thiram, based on percent of total pounds applied. Both active ingredients are classified as fungicides by the EPA.

No individual State's soybean postharvest chemical use data were able to be published for the nine surveyed States due to NASS confidentiality and disclosure restrictions. There were insufficient reports to publish State level insecticide or fungicide usage on soybeans for Arkansas, Illinois, Iowa, Missouri, and Ohio. Total pounds applied, rates, and percent treated were tabulated and published as a sum of the program States. Indiana, Kansas, Minnesota, and Nebraska reported no pesticides used on 2002 crop year soybeans stored off-farm.

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 in separate tables labeled "Spring and Summer" and "Fall and Winter". The percentages shown in these data tables pertain to pest management practices for all grains handled by the facilities sampled, not just corn and soybeans.

**Corn: Postharvest Chemical Applications,
Percent Treated and Total Applied,
Program States and Total, 2002 Marketing Year ¹**

State	Volume Handled	Percent Treated and Total Applied			
		Insecticide		Fungicide	
	<i>Mil. bu.</i>	<i>Percent</i>	<i>1,000 Lbs.</i>	<i>Percent</i>	<i>1,000 Lbs.</i>
IL ²	1,907.8	2.35	8.4		
IN	584.7	0.63	0.8		
IA	1,909.5	1.24	4.8		
KS	186.4	6.76	2.5		
MN ²	902.1				
NE	654.9	2.42	6.1		
OH ²	308.0				
TX	281.4	6.92	2.7		
Total	6,734.8	1.82	35.6	0.03	98.4

¹ Insufficient reports to publish data for one or more of the pesticide classes.

² Data not published due to confidentiality restrictions.

**Corn: Postharvest Chemical Applications,
Chemical Application Rates and Total Applied,
Total of Program States, 2002 Marketing Year ^{1 2}**

Agricultural Chemical	Volume Treated	Appli- cations	Rate per Application	Rate per Mkt. Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per 1,000 Bu.</i>	<i>Pounds per 1,000 Bu.</i>	<i>1,000 Lbs</i>
Insecticides:					
Aluminum phosphide	1.76	1.0	0.17	0.17	19.9
Malathion	0.17	1.0	0.20	0.20	2.3
Pirimiphos-methyl	0.05	1.0	0.30	0.30	1.0
Silicone dioxide	0.09	1.0	1.03	1.03	6.4

¹ Volume handled by grain storage facilities in the eight States surveyed was 6.7 billion bushels. States included are IL, IN, IA, KS, MN, NE, OH, and TX.

² Insufficient reports to publish usage data for carbon dioxide, chlorpyrifos-methyl, fludioxonil, metalaxyl, methyl bromide, N-octy-bicycloheptene dicarbo., piperonyl butoxide, phosphine gas, propionic acid, pyrethrins, and silica gel.

**Corn: Postharvest Chemical Applications,
Illinois, 2002 Marketing Year ^{1 2}**

Agricultural Chemical	Volume Treated	Applications	Rate per Application	Rate per Mkt. Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per 1,000 Bu.</i>	<i>Pounds per 1,000 Bu.</i>	<i>1,000 Lbs</i>
Insecticides:					
Aluminum phosphide	2.23	1.0	0.14	0.14	6.0

¹ Volume handled by Illinois grain storage facilities was 1.9 billion bushels.

² Insufficient reports to publish usage data for carbon dioxide, chlorpyrifos-methyl, fludioxonil, malathion, metalaxyl, pirimphos-methyl, phosphine gas, silica gel, and silicon dioxide.

**Corn: Postharvest Chemical Applications,
Indiana, 2002 Marketing Year ^{1 2}**

Agricultural Chemical	Volume Treated	Applications	Rate per Application	Rate per Mkt. Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per 1,000 Bu.</i>	<i>Pounds per 1,000 Bu.</i>	<i>1,000 Lbs</i>
Insecticides:					
Aluminum phosphide	0.63	1.0	0.21	0.21	0.8

¹ Volume handled by Indiana grain storage facilities was 584.7 million bushels.

² Insufficient reports to publish usage data for malathion.

**Corn: Postharvest Chemical Applications,
Iowa, 2002 Marketing Year ^{1 2}**

Agricultural Chemical	Volume Treated	Applications	Rate per Application	Rate per Mkt. Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per 1,000 Bu.</i>	<i>Pounds per 1,000 Bu.</i>	<i>1,000 Lbs</i>
Insecticides:					
Aluminum phosphide	1.24	1.0	0.20	0.20	4.8
Malathion	0.09	1.0	0.39	0.39	0.7
Silicone dioxide	0.10	1.00	1.15	1.15	2.2

¹ Volume handled by Iowa grain storage facilities was 1.9 billion bushels.

² Insufficient reports to publish usage data for pirimiphos-methyl and silica gel

**Corn: Postharvest Chemical Applications,
Kansas, 2002 Marketing Year ^{1 2}**

Agricultural Chemical	Volume Treated	Applications	Rate per Application	Rate per Mkt. Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per 1,000 Bu.</i>	<i>Pounds per 1,000 Bu.</i>	<i>1,000 Lbs</i>
Insecticides:					
Aluminum phosphide	6.76	1.0	0.20	0.20	2.5

¹ Volume handled by Kansas grain storage facilities was 186.4 million bushels.

² Insufficient reports to publish usage data for malathion and pirimiphos-methyl.

**Corn: Postharvest Chemical Applications,
Nebraska, 2002 Marketing Year ^{1 2}**

Agricultural Chemical	Volume Treated	Applications	Rate per Application	Rate per Mkt. Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per 1,000 Bu.</i>	<i>Pounds per 1,000 Bu.</i>	<i>1,000 Lbs</i>
Insecticides:					
Aluminum phosphide	2.22	1.0	0.17	0.17	2.5
Malathion	0.11	1.0	0.39	0.39	0.3
Silicon dioxide	0.11	1.0	0.53	0.53	0.4

¹ Volume handled by Nebraska grain storage facilities was 654.9 million bushels.

² Insufficient reports to publish usage data for methyl-bromide and silica gel.

**Corn: Postharvest Chemical Applications,
Texas, 2002 Marketing Year ^{1 2}**

Agricultural Chemical	Volume Treated	Applications	Rate per Application	Rate per Mkt. Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per 1,000 Bu.</i>	<i>Pounds per 1,000 Bu.</i>	<i>1,000 Lbs</i>
Insecticides:					
Aluminum phosphide	6.88	1.0	0.14	0.14	2.7
Malathion	0.78	1.0	0.10	0.10	0.2
Silicone dioxide	0.36	1.0	1.45	1.45	1.5

¹ Volume handled by Texas grain storage facilities was 281.4 million bushels.

² Insufficient reports to publish usage data for carbon dioxide, phosphine gas, piperonyl butoxide, pirimiphos-methyl, and pyrethrins.

**Soybeans: Postharvest Chemical Applications,
Percent Treated and Total Applied,
Program States and Total, 2002 Marketing Year ¹**

State	Volume Handled	Percent Treated and Total Applied			
		Insecticide		Fungicide	
	<i>Mil. bu.</i>	<i>Percent</i>	<i>1,000 Lbs.</i>	<i>Percent</i>	<i>1,000 Lbs.</i>
AR ²	81.6				
IL ²	570.6				
IN	323.6				
IA ²	772.7				
KS	78.4				
MN	482.6				
MO ²	230.7				
NE	145.5				
OH ²	253.7				
Total ³	2,939.4	0.02	0.1		5.4

¹ Insufficient reports to publish data for one or more of the pesticide classes.

² Data not published due to confidentiality restrictions.

³ Fungicide percent treated less than 0.005 percent.

**Soybeans: Postharvest Chemical Applications,
Chemical Application Rates and Total Applied,
Total of Program States, 2002 Marketing Year ^{1 2}**

Agricultural Chemical	Volume Treated	Appli-cations	Rate per Application	Rate per Mkt. Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per 1,000 Bu.</i>	<i>Pounds per 1,000 Bu.</i>	<i>1,000 Lbs</i>
Fungicides:					
Carboxin ³		1.0	28.00	28.00	2.7
Thiram ³		1.0	28.00	28.00	2.7

¹ Volume handled by grain storage facilities in the nine States surveyed was 2.9 billion bushels. States included are AR, IL, IN, IA, KS, MN, MO, NE, and OH.

² Insufficient reports to publish usage data for allethrin, aluminum phosphide, chlorpyrifos, fludioxonil, malathion, metalaxyl, N-octy-bicycloheptene dicarbo., petroleum distillate, piperonyl butoxide, and pyrethrins.

³ Volume treated less than 0.005 percent.

**Pest Management Practices,
Percent of Operations Utilizing Practice,
All Grains Handled, 2002**

Practice	Program States					
	AR	IL	IN	IA	KS	MN
	<i>Percent of Operations</i>					
Mechanical Devices:						
Aeration controller	54	30	30	38	41	43
Deep bin sampler	8	6	3	3	13	4
Grain spreader in bins	31	24	18	34	9	31
Phosphine pellet dispenser	21	16	7	6	49	3
Power probe	23	49	38	41	43	17
Protein analyzer	4	4	7	9	16	22
Re-circulation fumigation device	12	6	3	2	12	1
Temperature cables in bins	33	57	33	40	70	39
Cleaning Activities:						
Clean aeration ducts	71	88	81	81	75	76
Control vegetation around bins	92	96	92	99	98	96
Core bins after filling	44	89	78	82	43	73
Spray/fumigate empty bins	54	47	56	55	67	22
Hose down empty bins	42	8	10	12	12	7
Pick up spilled grain/clean surrounding area	92	97	98	99	99	95
Sweep/vacuum empty bins	90	92	90	98	91	90
Other cleaning activities	6	7	8	5	5	4

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**Pest Management Practices,
Percent of Operations Utilizing Practice,
All Grains Handled, 2002 (continued)**

Practice	Program States				
	MO	NE	OH	TX	ALL
	<i>Percent of Operations</i>				
Mechanical Devices:					
Aeration controller	15	26	27	41	33
Deep bin sampler	1	6	6	9	6
Grain spreader in bins	12	15	29	7	22
Phosphine pellet dispenser	7	19	4	20	15
Power probe	14	47	42	22	38
Protein analyzer	3	19	5	11	10
Re-circulation fumigation device	1	9	3	7	5
Temperature cables in bins	21	52	67	23	49
Cleaning Activities:					
Clean aeration ducts	65	75	78	79	80
Control vegetation around bins	92	98	98	98	96
Core bins after filling	67	70	68	44	72
Spray/fumigate empty bins	71	57	53	50	51
Hose down empty bins	29	12	21	14	13
Pick up spilled grain/clean surrounding area	96	100	99	99	98
Sweep/vacuum empty bins	93	89	91	93	92
Other cleaning activities	3	3			

**Pest Management Practices,
Percent of Operations Utilizing Practice,
All Grains Handled, 2002, Spring and Summer**

Practice	Program States					
	AR	IL	IN	IA	KS	MN
	<i>Percent of Operations</i>					
Inspect for Insects:						
Concrete Silos:						
Daily	2	1	8	3	3	1
Twice a week		2	3	2	3	1
Weekly	4	28	12	12	31	5
Every two weeks	2	9	4	8	10	4
Monthly	4	23	8	13	22	6
Other	2	1	5	3	4	1
Do not inspect	2	2	4	2	2	4
Do not have this structure	85	34	56	57	25	77
Steel Tanks or Bins:						
Daily	10	1	8	5	1	9
Twice a week	6	3	5	7	2	2
Weekly	37	37	22	29	19	21
Every two weeks	2	19	9	18	8	20
Monthly	15	32	27	29	30	27
Other	2	2	11	4	10	3
Do not inspect	25	1	7	4	2	9
Do not have this structure	4	5	10	5	28	9
Other Structures:						
Daily	2		1	3		3
Twice a week		1		6	1	2
Weekly	4	13	5	15	3	11
Every two weeks		6	1	9	2	13
Monthly		15	3	10	9	21
Other	2	2	4	2	1	2
Do not inspect	4	1	3	2	2	4
Do not have this structure	88	62	83	53	81	43

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**Pest Management Practices,
Percent of Operations Utilizing Practice,
All Grains Handled, 2002, Spring and Summer (continued)**

Practice	Program States				
	MO	NE	OH	TX	ALL
	<i>Percent of Operations</i>				
Inspect for Insects:					
Concrete Silos:					
Daily	3	4	7	3	3
Twice a week		6	9	5	3
Weekly	7	21	17	12	18
Every two weeks	2	4	9	8	7
Monthly	6	24	17	6	16
Other			9	1	3
Do not inspect	2	1	7	3	3
Do not have this structure	80	38	26	62	47
Steel Tanks or Bins:					
Daily	1	3	7	6	4
Twice a week	3	3	12	6	5
Weekly	32	28	18	18	27
Every two weeks	13	13	9	21	15
Monthly	36	34	15	20	28
Other	2	1	9	5	4
Do not inspect	8	8	8	10	6
Do not have this structure	5	9	23	14	11
Other Structures:					
Daily		2	3	1	2
Twice a week		3		1	2
Weekly	3	17	2	3	10
Every two weeks	1	6	1	4	5
Monthly	7	24	2	2	12
Other	1				1
Do not inspect	1	4	1	1	2
Do not have this structure	87	43	91	88	66

**Pest Management Practices,
Percent of Operations Utilizing Practice,
All Grains Handled, 2002, Spring and Summer**

Practice	Program States					
	AR	IL	IN	IA	KS	MN
	<i>Percent of Operations</i>					
Measure Grain Temperature:						
Concrete Silos:						
Daily	6	2	5	2	5	
Twice a week		4		3	7	1
Weekly	4	21	18	14	41	4
Every two weeks		9	5	5	9	3
Monthly	2	15	5	4	8	5
Other		3	2	2	2	2
Do not inspect	4	12	10	12	4	8
Do not have this structure	85	34	56	57	25	77
Steel Tanks or Bins:						
Daily	13	2	7	2	2	3
Twice a week	8	7		4	4	3
Weekly	19	28	21	22	27	17
Every two weeks	2	15	9	11	8	11
Monthly	17	24	17	20	19	23
Other	4	4	8	9	3	10
Do not inspect	33	16	28	26	9	24
Do not have this structure	4	5	10	5	28	9
Other Structures:						
Daily	4	1		1		1
Twice a week	2	1		2	1	2
Weekly	2	12	5	13	5	9
Every two weeks		4	2	5	3	6
Monthly		11	2	7	6	13
Other		4	2	3	1	6
Do not inspect	4	7	5	16	3	20
Do not have this structure	88	62	83	53	81	43

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**Pest Management Practices,
Percent of Operations Utilizing Practice,
All Grains Handled, 2002, Spring and Summer (continued)**

Practice	Program States				
	MO	NE	OH	TX	ALL
	<i>Percent of Operations</i>				
Measure Grain Temperature:					
Concrete Silos:					
Daily	3	4	13	3	4
Twice a week	2	4	14	5	4
Weekly	6	25	24	12	19
Every two weeks		3	5	4	6
Monthly	3	17	8	3	9
Other		3	1	1	2
Do not inspect	5	5	9	11	9
Do not have this structure	80	38	26	62	47
Steel Tanks or Bins:					
Daily	6	4	13	5	4
Twice a week	5	2	13	5	5
Weekly	21	27	22	10	23
Every two weeks	6	8	5	7	10
Monthly	24	24	7	6	20
Other	1	5	3	7	6
Do not inspect	32	21	13	46	21
Do not have this structure	5	9	23	14	11
Other Structures:					
Daily		4	2		1
Twice a week		1		1	1
Weekly	2	14		4	8
Every two weeks	1	6	1	1	3
Monthly	6	15	1	1	8
Other		3			3
Do not inspect	4	15	5	5	9
Do not have this structure	87	43	91	88	66

**Pest Management Practices,
Percent of Operations Utilizing Practice,
All Grains Handled, 2002, Fall and Winter**

Practice	Program States					
	AR	IL	IN	IA	KS	MN
	<i>Percent of Operations</i>					
Inspect for Insects:						
Concrete Silos:						
Daily	4	1	8	3	2	1
Twice a week		1	2	2	3	1
Weekly	2	22	10	11	31	5
Every two weeks	2	15	3	7	10	3
Monthly	4	25	8	13	22	7
Other	2	1	6	4	6	1
Do not inspect	2	1	7	3	1	5
Do not have this structure	85	34	56	57	25	77
Steel Tanks or Bins:						
Daily	12	1	10	4	1	9
Twice a week	6	3	2	7	2	3
Weekly	40	30	21	23	19	19
Every two weeks	2	23	6	18	9	19
Monthly	13	35	28	32	30	28
Other	2	2	12	5	10	3
Do not inspect	21	1	10	6	2	10
Do not have this structure	4	5	10	5	28	9
Other Structures:						
Daily	4		1	3	1	3
Twice a week		1		6		2
Weekly	2	9	5	14	3	10
Every two weeks		10	1	8	1	12
Monthly		16	4	11	10	21
Other	2	1	4	3	2	3
Do not inspect	4	1	2	2	1	5
Do not have this structure	88	62	83	53	81	43

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**Pest Management Practices,
Percent of Operations Utilizing Practice,
All Grains Handled, 2002, Fall and Winter (continued)**

Practice	Program States				
	MO	NE	OH	TX	ALL
	<i>Percent of Operations</i>				
Inspect for Insects:					
Concrete Silos:					
Daily	3	4	7	4	3
Twice a week		6	9	5	3
Weekly	5	21	15	12	16
Every two weeks	1	4	9	6	8
Monthly	9	25	18	8	17
Other			9	1	3
Do not inspect	2	1	8	3	3
Do not have this structure	80	38	26	62	47
Steel Tanks or Bins:					
Daily	2	3	7	6	4
Twice a week	3	2	11	6	4
Weekly	26	28	16	17	24
Every two weeks	9	10	8	19	15
Monthly	42	37	17	23	31
Other	2	1	9	3	5
Do not inspect	11	9	9	10	6
Do not have this structure	5	9	23	14	11
Other Structures:					
Daily		2	3	2	2
Twice a week		2		1	2
Weekly	3	17	2	2	8
Every two weeks		6	1	3	6
Monthly	6	25	2	2	12
Other	1				1
Do not inspect	3	4	1	1	2
Do not have this structure	87	43	91	88	66

**Pest Management Practices,
Percent of Operations Utilizing Practice,
All Grains Handled, 2002, Fall and Winter**

Practice	Program States					
	AR	IL	IN	IA	KS	MN
	<i>Percent of Operations</i>					
Measure Grain Temperature:						
Concrete Silos:						
Daily	10	2	5	2	4	
Twice a week		4		2	8	1
Weekly		21	16	13	40	5
Every two weeks		9	5	5	8	3
Monthly	2	15	5	5	10	5
Other		3	2	3	2	2
Do not inspect	4	12	10	12	3	8
Do not have this structure	85	34	56	57	25	77
Steel Tanks or Bins:						
Daily	15	2	8	2	1	3
Twice a week	6	7	1	4	5	3
Weekly	23	30	18	19	26	16
Every two weeks	4	14	9	11	8	12
Monthly	15	24	16	23	20	24
Other	4	4	8	10	3	10
Do not inspect	29	15	28	26	9	23
Do not have this structure	4	5	10	5	28	9
Other Structures:						
Daily	6	1				1
Twice a week		1		2	1	2
Weekly	2	12	5	12	5	10
Every two weeks		4	2	4	3	6
Monthly		10	2	9	7	14
Other		3	2	4	1	5
Do not inspect	4	7	5	15	2	19
Do not have this structure	88	62	83	53	81	43

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**Pest Management Practices,
Percent of Operations Utilizing Practice,
All Grains Handled, 2002, Fall and Winter (continued)**

Practice	Program States				
	MO	NE	OH	TX	ALL
	<i>Percent of Operations</i>				
Measure Grain Temperature:					
Concrete Silos:					
Daily	3	3	13	3	4
Twice a week	2	4	16	5	5
Weekly	5	26	22	11	18
Every two weeks		3	6	5	6
Monthly	5	17	8	3	10
Other		3	1	1	2
Do not inspect	5	5	8	11	9
Do not have this structure	80	38	26	62	47
Steel Tanks or Bins:					
Daily	5	2	13	5	4
Twice a week	4	2	15	5	5
Weekly	19	30	20	10	23
Every two weeks	3	8	6	7	10
Monthly	31	23	7	6	20
Other	1	4	2	8	6
Do not inspect	32	21	13	45	21
Do not have this structure	5	9	23	14	11
Other Structures:					
Daily		2	2	1	1
Twice a week		2		1	1
Weekly	2	16		3	9
Every two weeks	1	6		1	3
Monthly	6	15	1	1	8
Other		3			3
Do not inspect	4	15	5	5	9
Do not have this structure	87	43	91	88	66

**Pest Management Practices,
Strategies Used in Determining Fumigation Schedule,
All Grains Handled, 2002 Crop Year**

Practice	Program States					
	AR	IL	IN	IA	KS	MN
	<i>Percent of Operations</i>					
Preset Calendar Date					4	
Bin Samples	64	5	25	5	18	
Scheduled with other handling operations	9	13		10	14	
Insect Trap Counts	9	3	13	5	2	
Visual Grain Inspection	9	54	50	69	56	100
Customer Request	9	20		5		
Other		4	13	5	6	

--continued

**Pest Management Practices,
Strategies Used in Determining Fumigation Schedule,
All Grains Handled, 2002 Crop Year (continued)**

Practice	Program States				
	MO	NE	OH	TX	ALL
	<i>Percent of Operations</i>				
Preset Calendar Date				6	2
Bin Samples	4	17	6	23	15
Scheduled with other handling operations	4	2		6	8
Insect Trap Counts		3	3	3	3
Visual Grain Inspection	61	62	79	61	59
Customer Request	30	3	3		6
Other		12	9		6

Survey Procedures

Operations were chosen from the off-farm grain storage facilities on the NASS List Sampling Frame known to or expected to handle corn or soybeans sometime from September 1, 2002 to August 31, 2003. Positive reports from the NASS Grain Stocks survey were used as the sampling frame. Nearly 2,300 operations were selected to participate in the 2003 Corn and Soybean Postharvest Survey, referencing the 2002-2003 crop marketing year.

Estimation Procedures

The chemical applications data, reported by product name or trade name, were reviewed within each State and across all program States for reasonableness and consistency. This review compared reported data with manufacturers' 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 consist of survey estimates 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 non-sampling errors.

Sampling variability of the estimates 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 grains, exhibit less variability than a rarely used product.

Non-sampling 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, are recommended by the manufacturer of the product, and are generally followed.

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 active ingredient applied at a specific volume. 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. 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.

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.

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.

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

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 summarized in the particular table that passed through the firms.

Volume treated: The amount that represents the percentage of volume handled receiving 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 name, associated class and trade name of active ingredients in this publication. The classes are insecticides (I) and fungicides (F).

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 corn 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	Carbon dioxide	Eco2Fume
F	Carboxin	Thiram, Vitavax
I	Chlorpyrifos	Lorsban
I	Chlorpyrifos-methyl	Reldan
F	Fludioxonil	Maxim
I	Malathion	several
F	Metalaxyl	Apron
I	Methyl bromide	several
I	N-octy bicycloheptene dicarbo.	BP-300
I	Petroleum distillate	Alleviate
I	Phosphine gas	Eco2Fume
I	Piperonyl butoxide	Alleviate, Prentox Spray, BP-300
I	Pirimiphos-methyl	Actellic
F	Propionic acid	Propionic Acid
I	Pyrethrins	Pyronyl Spray, BP-300
I	Silica gel	Protect-it
I	Silicon dioxide	Diatomaceous Earth, Insecto, Protect-It
F	Thiram	Vitavax, Thiram-Vitavax



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**2003 CORN and SOYBEAN
POSTHARVEST
CHEMICAL USE SURVEY**

Form Approved
O.M.B. Number 0535-0218
Approval Expires 12/31/03
Project Code 143

VERSION	ID	SUBT.	T-TYPE	TABLE	LINE
1	_____	__	0	000	00

CONTACT RECORD		
DATE	TIME	NOTES

RESPONSE CODES	
3 - COMPLETE	OFFICE USE 910
4 - SCREENOUT	
5 - NO CORN/SOYBEANS 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 Corn and Soybean 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]

004 _____

Name _____
Address _____
Phone (____) _____

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

TEXAS ONLY

1a. Did this operation (as listed on the label) handle or receive any CORN from September 1, 2002 to August 31, 2003?

YES - [Go to page 2.] NO - [Go to Conclusion, back page.]

ARKANSAS and MISSOURI ONLY

1b. Did this operation (as listed on the label) handle or receive any SOYBEANS from September 1, 2002 to August 31, 2003?

YES - [Go to page 3.] NO - [Go to Conclusion, back page.]

ALL OTHER STATES

1c. Did this operation (as listed on the label) handle or receive any CORN and/or SOYBEANS from September 1, 2002 to August 31, 2003?

YES - [Go to page 2 for corn, page 3 for soybeans.] NO - [Go to Conclusion, back page.]

Now I would like to ask about the corn handled/received from September 1, 2002 to August 31, 2003.

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

1. What was the total quantity of the corn handled/received from September 1, 2002 to August 31, 2003 on this operation?

QUANTITY

200	
-----	--



1 BUSHEL (56 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 corn, 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: [Does item code 200 equal item code 206?]

OR

[Does item code 207 equal 100%?]

YES - Verify the operation did not apply any postharvest chemicals to corn in storage, on the ground, in **barges, ships, rail cars, or on trucks** between September 1, 2002 and August 31, 2003.

If no postharvest chemicals were applied to corn, go to next page (TEXAS: go to **Section C, Pest Management**).

If postharvest chemicals were applied to corn, correct either item code 206 or item code 207 and go to next page (TEXAS: go to **Section B**).

NO - Go to next page (TEXAS: go to **Section B**).

Now I would like to ask about the soybeans handled/received from September 1, 2002 to August 31, 2003.

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

1. What was the total quantity of the soybeans handled/received from September 1, 2002 to August 31, 2003 on this operation?

QUANTITY	
210	_____



1 BUSHEL (60 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
211		212 _____

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

QUANTITY	
216	_____

PERCENT OF TOTAL NOT TREATED	
OR	217 _____

ENUMERATOR NOTE: [Does item code 210 equal item code 216?]

OR

[Does item code 217 equal 100%?]

YES - Verify the operation did not apply any postharvest chemicals to soybeans on the ground, in barges, ships, rail cars, or on trucks between September 1, 2002 and August 31, 2003.

If no postharvest chemicals were applied to soybeans, go to **Section C, Pest Management**.

If postharvest chemicals were applied to soybeans, correct either item code 216 or item code 217 and go to **Section B**.

NO - Go to **Section B**.

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 **corn and/or soybeans** handled, stored or processed by your operation from September 1, 2002 to August 31, 2003. 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 corn and/or soybeans treated by this operation while in storage, on the ground, in barges, ships, rail cars or on trucks by.

OFFICE USE
LINES IN TABLE

T-TYPE	TABLE	LINE	399
3	001	99	

CROP CODES for COLUMN 1	
191	CORN
26	SOYBEANS

STORAGE CODES for COLUMN 3	
5	In Bound
6	During Binning
7	While Stored
8	Out Bound
9	Not Binned

NOTES	LINE	1	2		3	4
		[Enter crop code from above.]	What product was applied? (In Respondent Booklet)		When was this product used? [Enter code from above.]	What was the total quantity of corn or soybeans treated with this chemical (in column 2)?
		CODE	a COMMON or TRADE NAME	b PRODUCT CODE	CODE	
	01	301		302	303	304
	02	301		302	303	304
	03	301		302	303	304
	04	301		302	303	304
	05	301		302	303	304
	06	301		302	303	304
	07	301		302	303	304
	08	301		302	303	304
	09	301		302	303	304
	10	301		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 [Ask only if EPA No. cannot be reported.]	Target Pest
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

B POSTHARVEST CHEMICAL TREATMENTS APPLIED

B

UNIT CODES for COLUMN 5

1 - BUSHEL
(Corn 56 lbs) (Soybeans 60 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 8

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 9

3 - DIRECT SPRAY

5 - TOP DRESS

7 - MIXING PELLETS/TABLETS

9 - DIRECT POWDERING

10 - OTHER
(Specify _____)

LINE	5	6	7	8	9
	[Enter unit code from above.]	If column 5 unit equals "8", enter pounds per unit.	What was the total amount of formulated product applied to the (column 4) amount of corn or soybeans?	[Enter unit code from above.]	What was the method used to apply this product?
		CODE		CODE	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:

Now I have some questions about pest management practices you may have used at your facilities. Include **ALL GRAINS** and **OILSEEDS** 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 did you inspect grain or oilseeds 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	1 DAILY 2 TWICE A WEEK 3 WEEKLY 4 EVERY 2 WEEKS 5 MONTHLY 6 OTHER - (Specify _____) 7 DO NOT MONITOR 8 DO NOT HAVE THIS STRUCTURE
Steel Tanks or Bins.	660	661	
Other Structures (Include wood bins.).	662	663	

3. How often do you measure grain or oilseed 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	1 DAILY 2 TWICE A WEEK 3 WEEKLY 4 EVERY 2 WEEKS 5 MONTHLY 6 OTHER - (Specify _____) 7 DO NOT MONITOR 8 DO NOT HAVE THIS STRUCTURE
Steel Tanks or Bins.	666	667	
Other Structures (Include wood bins.).	668	669	

4. Which practices do you use at storage facilities—

Did you—

a. sweep/vacuum empty bins?

YES - [Enter code 1 and continue.]

NO

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/clean surrounding area?

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 or oilseeds?

YES - [Enter code 1 and continue.]

NO - [Go to Conclusion.]

682

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

- 1 PRESET CALENDAR DATE
- 2 BIN SAMPLES
- 3 SCHEDULED WITH OTHER HANDLING OPERATIONS
- 4 INSECT TRAP COUNTS
- 5 VISUAL GRAIN INSPECTION
- 6 CUSTOMER REQUEST
- 7 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 summary of the results of this survey in the mail?
Results will also be available on the Internet at <http://www.usda.gov/nass/>, in the fall of 2004

YES - [Enter code 1.] NO

CODE
099

[Thank the respondent then review this questionnaire.]

RECORDS USE

Did respondent use operation records to report chemical data?

YES - [Enter code 1.] NO

064

ENDING TIME [MILITARY]

065
_ _ _ _

OFFICE USE -TIME IN HOURS

066
_ . _

SUPPLEMENTS USED

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

NUMBER
068

RESPONDENT

- 1 OPERATOR/MANAGER
- 2 SPOUSE
- 3 ACCOUNTANT/BOOKKEEPER
- 4 OTHER
- 8 OFFICE HOLD
- 9 PARTNER

.....

CODE
101

Respondent's name: _____ (Phone) (____) _____

ENUMERATOR _____

ENUMERATOR ID
098

DATE

MM DD YY
987
_ _ / _ _ / 03

OFFICE USE
EVALUATION
100

Notes:

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The time required to complete this information collection is estimated to average 30 minutes per response.

Report Features

Released March 10, 2004, 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 March 2005. This report will cover the use of postharvest chemicals used on oranges.

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

Michelle Radice, Environmental Statistician (202) 690-2284

Sarah Hoffman, Head, Environmental and Demographics Section (202) 720-0684

Linda Hutton, Chief, Environmental, Economics and Demographics Branch (202) 720-6146

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