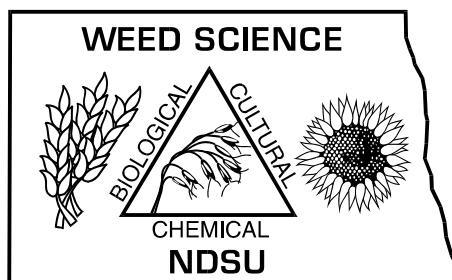


Pesticide Use and Pest Management Practices in North Dakota 2008



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TABLE OF CONTENTS

Introduction	3
Methodology	3
The Questionnaire	3
The Sample	3
Data Collection and Editing	4
The Summary	4
Statewide Pesticide Usage for North Dakota	5
Table 1. Acres Treated by Crop	6
Table 2. Acres Treated by North Dakota Agricultural Statistics Districts	6
Table 3. Acres Treated by Crop and by North Dakota Agricultural Statistics Districts	7-10
Table 4. On-Farm Seed Treatment by Crop	11-12
Table 5. On-Farm Seed Treatment by Active Ingredient	12
Table 6. Pesticide Use for Wheat	13
Table 7. Pesticide Use for Barley	14
Table 8. Pesticide Use for Oat	15
Table 9. Pesticide Use for Corn	16
Table 10. Genetically Modified Crops - Corn	16
Table 11. Pesticide Use for Soybean	17
Table 12. Genetically Modified Crops - Soybean	17
Table 13. Pesticide Use for Dry Edible Bean	18
Table 14. Pesticide Use for Field Pea	19
Table 15. Pesticide Use for Lentil	20
Table 16. Pesticide Use for Sunflower	21
Table 17. Genetically Modified Crops - Sunflower	23
Table 18. Pesticide Use for Safflower	22
Table 19. Pesticide Use for Flax	22
Table 20. Pesticide Use for Canola	23
Table 21. Genetically Modified Crops - Canola	23
Table 22. Pesticide Use for Mustard	23
Table 23. Pesticide Use for Sugarbeet	24
Table 24. Genetically Modified Crops - Sugarbeet	24
Table 25. Pesticide Use for Potato	25
Table 26. Pesticide Use for Alfalfa	25
Table 27. Pesticide Use for Other Hay	26
Table 28. Pesticide Use for Conservation Reserve Program (CRP)	26
Table 29. Pesticide Use for Pasture	27
Table 30. Pesticide Use for Summer Fallow	27
Table 31. Herbicide Usage in North Dakota	28-29
Table 32. Desiccant Usage in North Dakota	29
Table 33. Insecticide Usage in North Dakota	30
Table 34. Fungicide Usage in North Dakota	30
Table 35. Pest Management Decisions and Practices	31
Appendix A. Survey Letter and Form	32-36
Appendix B. North Dakota Agricultural Statistics Districts	37
Appendix C. Common and Trade Names of Pesticides	38-39

NOTE: This report summarizes the information on pesticide use as reported by the farmers/ operators surveyed. The data do not imply endorsement of any particular product or practice. Also, some responses may have misreported use of pesticides due to similar-sounding chemical or trade names. In some cases, pesticides are approved for use before planting or after harvest, but not to a crop. The mention of an unregistered pesticide applied to a crop does not imply applications are legal or advocated by the authors. It is of the utmost importance that pesticide users read, understand and follow all label directions and precautions.

INTRODUCTION

This is the eighth major account of pesticide usage in North Dakota and describes pesticide usage on agricultural land in 2008. The information is derived from a comprehensive survey of North Dakota farm operators. The first seven comprehensive surveys to assess pesticide usage on major crops in North Dakota were conducted on 1978¹, 1984², 1989³, 1992⁴, 1996⁵, 2000⁶ and 2004⁷ pesticide applications.

Total acres treated with herbicides, insecticides, fungicides, and desiccants were 16,081,700 in 1978¹, 20,600,300 in 1984², 19,527,400 in 1989³, 19,034,200 in 1992⁴, 20,668,100 in 1996⁵, 19,087,900 in 2000⁶, 22,572,300 in 2004⁷ and 32,608,400 in 2008 (Table 1). Increase in soybean aphids and wheat diseases (leaf rust, tan spot and scab) may contribute to the increase in acres treated. Changes in pesticide-treated acres also may be due to pest outbreaks, changes in pest populations, tillage practices, substitution of nonchemical for chemical methods, shifts in acreage of major crops or new developments in pest control technology.

The survey of pesticide usage during 2008 in North Dakota was conducted because regular assessment of pesticide usage is an important indicator of changes in farming practices and farmer attitudes toward pesticides, as well as an indicator of the relative severity of various pests in the state.

The specific objectives of the survey were:

1. identify acreage of crops treated with each pesticide group, and identify specific pesticides used.
2. determine pesticide usage by state districts.
3. determine the percentage of pesticides applied by farm operator or custom applicator by air or ground equipment.
4. determine extent of use of several nonchemical pest control methods.

METHODOLOGY

North Dakota State University; USDA, National Agricultural Statistics Service, North Dakota Field Office (NASS); and the North Dakota Department of Agriculture designed the survey instrument. As in previous surveys, pesticide use data for wheat, barley, oat, corn, soybean, dry edible beans, dry pea, lentil, sunflower, safflower, flax, canola, mustard, sugarbeet, potato, alfalfa hay, other hay, CRP, fallow and pasture were requested for the 2008 crop year.

NASS was responsible for implementing the survey. The survey was conducted as a phone survey. NASS selected a sample population of 7,000 farm operators to represent each crop at the district level. The target for useable surveys was 3,500 responses, stratified across NASS's reporting districts. After selection of the sample population, a presurvey letter was mailed to alert selected growers of the survey effort and content. Interviews were conducted from late January through March 2009.

The Questionnaire

The questionnaire was designed to collect pesticide data for major and minor crops, summer fallow, CRP and pasture in North Dakota for the 2008 crop year. The questionnaire was similar to those used previously. Information on individual crop total acres seeded, acres seeded with any treated seed and acres seeded with farm-treated seed was obtained. Acres treated by crop were determined for the general pesticide categories of herbicides, insecticides, fungicides and desiccants.

Pesticide usage data included the active ingredient used, acres treated, number of applications, type of applicator and method of application for each major crop or land use identified by respondents in Section 1 of the questionnaire. The type of applicator meant the chemical was self-applied by the farm operator or custom applied. The method of application referred to aerial or ground applications.

For the pest management decisions and practices, questions were developed to query whether respondents scouted for pests, information they used to make treatment decisions, whether they used nonchemical methods of pest control, their intended GM crop usage and Internet use as an information resource.

The Sample

A sample of 7,000 farm operators was selected at random from the USDA National Agricultural Statistics Service (NASS) list of farm operators.

Data Collection and Editing

Telephone interviews were conducted from late January through March 2009. A total of 3,510 usable surveys was obtained.

Of the producers surveyed for 2008, 41% grew wheat, 17% barley, 9% oat, 20% corn, 19% soybean, 4% dry bean, 5% field pea, 1% lentil, 9% sunflower, 0.3% safflower, 5% flax, 7% canola, 0% crambe, 0.3% mustard, 2% sugarbeet, 0.2% potato, 29% alfalfa, 25% other hay, 38% CRP, 38% pasture and 3% fallow. These values are similar to the 2004 survey except fallow was used by 14% of the producers surveyed in 2004 as compared with 3% in 2008.

The data review process looked at completeness and reasonableness of data within each section of the questionnaire and across sections. For example, the acreage treated with herbicides reported in the first section of the questionnaire was compared with the total herbicide-treated acreage reported in Section III for each crop.

The Summary

All percentages at the state level shown in the summary tables are weighted averages of the districts. Data were summarized by obtaining a percent of total acres treated for the general pesticide category, as well as for specific chemicals, by crop, and by crop reporting districts. These percentages of total acres treated were multiplied by the NASS estimate of total acres planted to each crop in the district. State acres were obtained by the addition of these data with state percentages derived to obtain the weighted figures.

All results from the questionnaire were included in the summary tables. Items designated as “.” represent no data reported.

¹ Nalewaja, J.D., A.G. Dexter, J. Buchli, W. Hamlin, and G. Kimmel. 1980. Pesticide Usage in Major North Dakota Crops. North Dakota State University in cooperation with North Dakota Crop and Livestock Reporting Service, Agronomy Report 1. 33p.

² McMullen, M.P., A.G. Dexter, J.D. Nalewaja, W. Hamlin, and K. Davison. 1985. Pesticide Use on Major Crops in North Dakota, 1984. North Dakota State University in cooperation with North Dakota Crop and Livestock Reporting Service, Agronomy Report 3. 31p.

³ McMullen, M.P., A.G. Dexter, J.D. Nalewaja, and G. Dahl. 1989. Pesticide Use on Major Crops in North Dakota, 1989. North Dakota State University in cooperation with North Dakota Crop and Livestock Reporting Service, Extension Report 1. 50p.

⁴ Zollinger, R.K., M.P. McMullen, G. Dahl, A.G. Dexter, J.D. Nalewaja, W.G. Hamlin, and D.G. Becker. 1992. Pesticide Use and Pest Management Practices for Major Crops in North Dakota, 1992. North Dakota State University in cooperation with North Dakota Agricultural Statistics Service, Extension Report 15. 67p.

⁵ Zollinger, R.K., G. Dahl, M.P. McMullen, P. Glogoza, A.G. Dexter, S.C. Fitterer, G.E. Waldhaus, and K. Ignaszewski. 1998. Pesticide Use and Pest Management Practices for Major Crops in North Dakota, 1996. North Dakota State University in cooperation with North Dakota Agricultural Statistics Service, Extension Report 43. 79p.

⁶ Glogoza, P, M.P. McMullen, R.K. Zollinger, A. Thostenson, T. DeJong, W. Meyer, N. Schauer, and J. Olson. 2002. Pesticide Use and Pest Management Practices for Major Crops in North Dakota, 2000. North Dakota State University in cooperation with North Dakota Agricultural Statistics Service, Extension Report 79. 90p.

⁷ Zollinger, R.K., P. Glogoza, P, M.P. McMullen, C.A. Bradley, A.G. Dexter, D. Knopf, E. Wilson, T. DeJong, and W. Meyer. 2006. Pesticide Use and Pest Management Practices for Major Crops in North Dakota, 2004. North Dakota State University in cooperation with North Dakota Agricultural Statistics Service, Extension Publication W-1308. 39p.

Statewide Pesticide Usage for North Dakota

The reported pesticide-treated acres in Tables 1, 2 and 3 indicate acres that received one or more applications of a pesticide. The treated acres in pesticide usage Tables 4 through 32 include multiple applications to the same acreage as separate values in the total, and pesticides applied as a tank mixture were totaled separately unless a commercial premix was used. Thus, acres treated in pesticide Tables 4 through 34 can exceed 100% of the planted acres. See list of tables.

Herbicides, insecticides and fungicides applied one or more times (Table 1).

	Herbicide	Insecticides	Fungicides
	million acres		
2008	21.4	4.0	5.9
2004	19.3	0.9	2.1
2000 ¹	18.1	0.3	0.7
1996	18.7	1.3	0.6
1992	17.6	0.9	0.6
1989	17.4	1.8	0.4
1984	17.5	2.5	0.5

¹without sugarbeet and potato

Pesticides applied to approximately 54.9% of all combined crop, pasture, hay, CRP and summer fallow land (Table 1).

	Herbicides	Insecticides	Fungicides
	% of land		
2008	54.9	10.3	15.1
2004	48.6	2.4	5.4
2000	47.3	0.8	1.9
1996	47.3	3.2	1.6
1992	43.1	2.1	0.4

Total acres planted to treated seed (Table 1):

2008	12.1 million
2004	8.5 million
2000	7.8 million
1996	9.8 million

Total treated seed (Table 1).

	2008	2004	2000	1996
	%			
Wheat	43.6	35.0	33.5	45.3
Barley	49.2	42.1	39.6	50.9
Corn	92.8	81.1	73.4	79.4
Soybean	55.9	31.4	17.9	9.5
Dry bean	90.9	84.8	63.2	84.3
Sunflower	92.1	82.4	78.9	76.5
Canola	80.0	87.7	81.6	76.2

Total acres planted to on-farm treated seed (Table 1):

2008	4.6 million
2004	3.5 million
2000	3.9 million

On-farm treatment is most common for seed of potato, wheat and barley. Seed of corn, sunflower, canola and dry bean generally is purchased treated.

Total acres applied at least once (Table 1) or multiple times (Table 31) with herbicides.

	Herbicide	
	Treated at least once	Treated multiple times
	acres	
2008	21,364,800	41,106,800
2004	19,284,900	36,768,700
2000	18,434,430	31,480,330
1996	18,765,000	33,691,700
1992	17,573,200	28,777,400
1989	17,368,600	27,674,700
1984	17,539,800	24,819,300

Percentage of acres treated at least once with herbicides in 2008 (Table 1):

>90% wheat, barley, corn, soybean, dry bean, field pea, sunflower, flax, canola and sugarbeet
 <3% alfalfa hay, other hay, and pasture.
 Treated summer fallow acres was 36%, which was down from 44% in 2004.

Insecticides were used on 4 million acres of the surveyed crops in 2008 (Table 1). This is more than the 0.93 million in 2004, but less than the 6 million acres in 2000 (with NASS-estimated potato and sugarbeet acres), but more than the 1.26 million acres treated in 1996. More than 10% of the surveyed crop acres were treated with an insecticide. Potato (70.5%), sunflower (60.5%), soybean (57.9%), sugarbeet (44.3%) and lentil (24.7%) had the highest percentage of insecticide-treated crop.

Total acreage treated with fungicide, exclusive of seed treatment, increased to 15.1% of the surveyed acres treated in 2004 (Table 1) compared with 5.4% in 2004, 1.9% (without sugarbeet and potato) in 2000, 1.6% in 1996 and 1.4% in 1992 of total cropland treated at least once. The most frequently treated surveyed crops were sugarbeet and potato at 83.3% and 79%, of acres respectively. Wheat, barley, and dry bean showed a significant increase at 40.8%, 32.7%, and 39.9%, respectively. In 2000, 99% of sugarbeet and 96% of potato acres received a fungicide application but only 6.2% of the wheat acres were treated.

Table 1. Acreage planted, acreage treated and percentage of planted acreage treated with pesticides in surveyed crops, North Dakota, 2008.

Crop	Acres Planted ¹	Pesticide-treated Acres ²											
		Total		On-farm		Herbicide		Insecticide		Fungicide		Desiccants	
		1000	Treated Seed 1000	%	1000	Treated Seed 1000	%	1000	%	1000	%	1000	%
Wheat	9230	4022.3	43.6	3358.1	36.4	8828.2	95.6	682.5	7.4	3765.3	40.8	581.1	6.3
Barley	1650	812.1	49.2	710.1	43.0	1531.7	92.8	47.8	2.9	539.0	32.7	17.8	1.1
Oat	320	9.9	3.1	8.4	2.6	134.5	42.0	0.6	0.2	7.4	2.3	3.7	1.2
Corn	2550	2367	92.8	33.2	1.3	2488.5	97.6	85.7	3.4	101.9	4.0	0.1	.
Soybean	3800	2125.4	55.9	294.3	7.7	3751.2	98.7	2200.4	57.9	432.8	11.4	0.8	.
Dry bean	660	599.8	90.9	18.7	2.8	656.1	99.4	53.8	8.1	263.1	39.9	246.5	37.3
Field pea	520	101.6	19.5	82.3	15.8	484.7	93.2	31.1	6.0	77.2	14.8	152.1	29.2
Lentil	95	23.8	25.0	15.9	16.7	84.2	88.6	23.5	24.7	10.0	10.5	62.2	65.5
Sunflower	1115	1027.3	92.1	19.7	1.8	1037.7	93.1	674.2	60.5	264.5	23.7	100.5	9.0
Safflower	21.9	11.7	53.6	3.0	13.7	16.9	77.4	.	.	1.4	6.4	.	.
Flax	335	4.6	1.4	2.7	0.8	308.8	92.2	3.3	1.0	2.7	0.8	122.5	36.6
Canola	910	728.1	80.0	18.6	2.0	886.0	97.2	27.7	3.0	172.2	18.9	21.0	2.3
Crambe	0.22	.	.	.	.	.	.	.	.	.	.	.	.
Mustard	37.3	21.1	56.4	.	.	10.0	26.9	.	.	.	.	.	.
Sugarbeet	208	184.3	88.6	5.9	2.8	198.4	95.4	92.2	44.3	173.3	83.3	.	.
Potato	82	47.7	58.2	47.7	58.2	43.4	52.9	57.8	70.5	64.8	79.0	64.8	79.0
Alfalfa	1660	.	.	.	.	7.5	0.5	7.1	0.4	.	.	.	.
Other hay	1560	.	.	.	.	37.0	2.4	.	.	.	.	.	.
CRP ³	3013	.	.	.	.	390.9	13.0	0.1	.	.	.	.	.
Pasture	10419	.	.	.	.	213.1	2.0	4.4	.	0.5	.	.	.
Fallow	723	.	.	.	.	258.2	35.7	.	.	.	.	.	.
Total	38909.4	12086.7	31.1	4618.5	11.9	21367.1	54.9	3992.2	10.3	5876.1	15.1	1373.0	3.5

¹ Preliminary estimates by the National Agricultural Statistics Service with the following exceptions: Pasture acreage was taken from the 2007 census. Acreage for mustard, safflower, crambe, summer fallow and CRP were taken from Farm Service Agency data. All other crop acreages have been published by NASS at the district level.

² Multiple applications to the same acreage were totaled as one application within a pesticide group, . = no data reported.

³ CRP represents acres in the Conservation Reserve Program.

Table 2. Acreage planted, acreage treated and percentage of planted acreage treated with pesticides in surveyed crops from reporting districts of North Dakota, 2008.

Districts	Acres Planted ¹	Pesticide-treated Acres ²											
		Total		On-farm		Herbicide		Insecticide		Fungicide		Desiccants	
		1000	Treated Seed 1000	%	1000	Treated Seed 1000	%	1000	%	1000	%	1000	%
Northwest	5043.2	1145.3	22.7	834.5	16.5	3152.1	62.5	209.9	4.2	824.0	16.3	290.8	5.8
North Central	3767.0	1257.0	33.4	636.2	16.9	2259.2	60.0	322.1	8.6	539.7	14.3	116.3	3.1
Northeast	4689.2	2553.2	54.4	958.0	20.4	3829.9	81.7	857.4	18.3	1879.5	40.1	595.2	12.7
West Central	4147.0	611.8	14.8	376.2	9.1	1434.6	34.6	72.9	1.8	231.5	5.6	44.7	1.1
Central	3957.8	1309.1	33.1	322.8	8.2	2254.1	57.0	477.7	12.1	499.2	12.6	109.2	2.8
East Central	2657.7	1571.8	59.1	220.7	8.3	2142.5	80.6	915.3	34.4	318.9	12.0	46.2	1.7
Southwest	4769.5	883.1	18.5	767.2	16.1	1457.0	30.5	83.6	1.8	560.9	11.8	16.6	0.3
South Central	4573.6	445.1	9.7	86.3	1.9	1300.3	28.4	175.8	3.8	292.9	6.4	11.5	0.3
Southeast	3802.4	1562.7	41.1	53.3	1.4	2264.8	59.6	666.2	17.5	169.6	4.5	13.9	0.4
Comb. Districts ³	1502.0	747.6	49.8	363.6	24.2	1272.5	84.7	211.3	14.1	559.8	37.3	128.6	8.6
Total	38909.4	12086.7	31.1	4618.5	11.9	21367.1	54.9	3992.2	10.3	5876.1	15.1	1373.0	3.5

¹ Preliminary estimates by the National Agricultural Statistics Service with the following exceptions: Pasture acreage was taken from the 2007 census. Acreage for mustard, safflower, crambe, summer fallow and CRP were taken from Farm Service Agency data. All other crop acreages have been published by NASS at the district level.

² Multiple applications to the same acreage were totaled as one application within a pesticide group.

³ Data published in combined districts to avoid disclosure of individual operations.

Table 3. Acreage planted, acreage treated and percentage of planted acreage treated with pesticides, by crop, from reporting districts in North Dakota, 2008.

Crop/District	Acres Planted ¹	Pesticide-treated Acres ²											
		Total		On-farm		Herbicide		Insecticide		Fungicide		Desiccants	
		1000	1000	%	1000	%	1000	%	1000	%	1000	%	1000
Wheat													
Northwest	2025	633.6	31.3	586.7	29.0	1922.0	94.9	109.5	5.4	599.5	29.6	61.1	3.0
North Central	880	461.4	52.4	419.5	47.7	846.2	96.2	59.2	6.7	319.9	36.4	45.7	5.2
Northeast	1614	952.4	59.0	714.4	44.3	1566.9	97.1	250.3	15.5	1028.3	63.7	290.8	18.0
West Central	977	321.8	32.9	296.2	30.3	911.7	93.3	30.0	3.1	182.8	18.7	3.0	0.3
Central	701	275.8	39.3	217.2	31.0	674.5	96.2	53.2	7.6	314.2	44.8	70.6	10.1
Southwest	1230	745.9	60.6	718.0	58.4	1167.0	94.9	72.8	5.9	553.7	45.0	4.8	0.4
South Central	759	93.7	12.3	68.1	9.0	730.8	96.3	22.8	3.0	229.4	30.2	4.6	0.6
Combined East Central and Southeast Districts	1044	537.8	51.5	337.9	32.4	1009.1	96.7	84.7	8.1	537.4	51.5	100.6	9.6
Total	9230	4022.3	43.6	3358.1	36.4	8828.2	95.6	682.5	7.4	3765.3	40.8	581.1	6.3
Barley													
Northwest	328	176.0	53.7	175.0	53.3	305.4	93.1	11.6	3.5	157.4	48.0	.	.
North Central	393	206.6	52.6	195.8	49.8	383.6	97.6	14.0	3.6	91.2	23.2	12.6	3.2
Northeast	282	159.5	56.6	133.7	47.4	272.0	96.5	1.4	0.5	117.7	41.7	.	.
West Central	164	64.7	39.4	56.9	34.7	133.3	81.3	.	.	32.6	19.9	1.4	0.9
Central	193	91.8	47.6	71.1	36.8	185.7	96.2	12.7	6.6	64.5	33.4	3.8	1.9
East Central	55	39.6	72.0	15.1	27.4	54.4	99.0	1.8	3.3	21.7	39.4	.	.
Southwest	95	48.0	50.5	43.6	45.9	64.9	68.3	6.2	6.5	7.1	7.5	.	.
South Central	102	18.4	18.0	16.7	16.4	100.1	98.1	.	.	38.3	37.6	.	.
Southeast	38	7.6	19.9	2.2	5.8	32.3	84.9	.	.	8.5	22.2	.	.
Total	1650	812.1	49.2	710.1	43.0	1531.7	92.8	47.8	2.9	539.0	32.7	17.8	1.1
Oat													
Northwest	25.0	1.2	5.0	1.2	5.0	10.6	42.4	.	.	.	.	.	.
North Central	32.0	2.7	8.4	1.2	3.7	23.1	72.1	.	.	1.6	5.2	3.7	11.7
Northeast	7.0	0.5	7.6	0.5	7.6	1.7	24.4	.	.	.	.	.	.
West Central	63.0	.	.	.	.	11.9	19.0	.	.	.	.	.	.
Central	33.5	0.4	1.3	0.4	1.3	19.5	58.1	.	.	1.0	3.1	.	.
East Central	3.5	2.5	72.5	2.5	72.5	3.5	100.0	.	.	1.8	50.7	.	.
Southwest	39.0	1.0	2.6	1.0	2.6	14.2	36.5	.	.	0.2	0.4	.	.
South Central	95.0	1.5	1.5	1.5	1.5	41.2	43.4	0.6	0.6	1.9	2.0	.	.
Southeast	22.0	.	.	.	.	8.7	39.6	.	.	0.9	4.2	.	.
Total	320.0	9.9	3.1	8.4	2.6	134.5	42.0	0.6	0.2	7.4	2.3	3.7	1.2
Corn													
Northwest	22	21.7	98.5	.	.	21.7	98.5	.	.	.	.	.	.
North Central	114	94.3	82.7	0.2	0.1	112.7	98.6	1.7	1.5	.	.	.	.
Northeast	280	264.8	94.6	.	.	274.8	98.1	1.7	0.6	26.6	9.5	.	.
West Central	63	63.0	100.0	.	.	62.1	98.6	.	.	.	.	.	.
Central	315	298.1	94.6	.	.	309.1	98.1	.	.	12.5	4.0	0.1	0.0
East Central	680	623.5	91.7	32.3	4.8	666.0	97.9	29.4	4.3	34.8	5.1	.	.
Southwest	58	50.1	86.5	0.8	1.3	57.8	99.6	3.9	6.7	.	.	.	.
South Central	148	141.5	95.6	.	.	136.8	92.4	0.9	0.6	.	.	.	.
Southeast	870	810.0	93.1	.	.	847.8	97.5	48.1	5.5	28.0	3.2	.	.
Total	2550	2367.0	92.8	33.2	1.3	2488.7	97.6	85.7	3.4	101.9	4.0	0.1	0.0
Soybean													
Northwest	20.8	20.8	100.0	.	.	20.8	100.0	11.2	54.1	.	.	.	.
North Central	171.0	99.8	58.4	7.0	4.1	168.0	98.3	73.7	43.1	19.0	11.1	.	.
Northeast	560.0	246.2	44.0	48.1	8.6	556.7	99.4	368.8	65.9	114.3	20.4	.	.
Central	680.0	402.1	59.1	21.4	3.2	674.9	99.3	348.9	51.3	55.3	8.1	0.8	0.1
East Central	1230.0	732.0	59.5	166.8	13.6	1203.0	97.8	835.3	67.9	147.3	12.0	.	.
South Central	28.0	3.9	14.0	.	.	28.0	100.0	1.3	4.6	3.9	13.8	.	.
Southeast	1105.0	620.6	56.2	51.0	4.6	1094.6	99.1	561.2	50.8	93.1	8.4	.	.
Combined WC, SE Dist.	5.2	.	.	.	.	5.0	96.2	.	.	.	.	.	.
Total	3800.0	2125.4	55.9	294.3	7.7	3751.2	98.7	2200.4	57.9	432.8	11.4	0.8	0.0

Table 3. Continued.

Crop/District	Acres Planted ¹	Pesticide-treated Acres ²											
		Total		On-farm		Herbicide		Insecticide		Fungicide		Desiccants	
		Treated Seed	%	Treated Seed	%	1000	%	1000	%	1000	%	1000	%
Dry bean													
Northwest	6.7	5.8	87.0	4.6	68.3	6.7	100.0	6.7	99.4	4.6	68.3	5.4	80.7
North Central	43.5	43.0	98.9	.	.	43.3	99.5	.	.	0.7	1.7	15.3	35.1
Northeast	391.0	346.4	88.6	7.4	1.9	387.9	99.2	17.4	4.5	184.4	47.2	185.7	47.5
Central	72.0	72.0	100.0	4.3	6.0	72.0	100.0	.	.	6.5	9.1	7.8	10.9
East Central	93.0	88.5	95.1	.	.	93.0	100.0	16.8	18.0	61.4	66.1	26.6	28.6
Southeast	30.5	23.0	75.5	.	.	30.0	98.2	12.9	42.4	5.4	17.8	5.6	18.5
Combined WC, SW and SC Districts	23.3	21.1	90.4	2.4	10.3	23.3	100.0	.	.	.	.	.	.
Total	660.0	599.8	90.9	18.7	2.8	656.1	99.4	53.8	8.1	263.1	39.9	246.5	37.3
Field pea													
Northwest	298.0	51.1	17.2	46.0	15.4	288.3	96.7	30.7	10.3	50.7	17.0	103.4	34.7
North Central	59.0	12.1	20.6	8.5	14.4	59.0	100.0	.	.	13.1	22.2	16.0	27.1
Northeast	15.4	3.6	23.2	0.7	4.6	15.4	100.0	.	.	4.8	31.2	2.5	16.4
West Central	84.0	25.6	30.5	20.3	24.2	76.1	90.6	.	.	4.9	5.8	12.9	15.4
Central	13.4	8.9	66.7	6.6	49.1	6.8	50.9	.	.	3.8	28.1	11.5	86.0
Southwest	28.0	.	.	.	.	22.3	79.6	.	.	.	.	5.7	20.4
South Central	16.7	.	.	.	.	13.7	82.0	0.4	2.4	.	.	.	.
Combined East Central and Southeast Districts	5.5	0.2	3.5	0.2	3.5	3.1	56.2	.	.	.	.	.	.
Total	520.0	101.6	19.5	82.3	15.8	484.7	93.2	31.1	6.0	77.2	14.8	152.1	29.2
Lentil													
Northwest	80.5	23.8	29.5	15.9	19.7	77.7	96.5	22.0	27.4	10.0	12.4	57.1	71.0
Southwest	6.1	.	.	.	.	.	.	.	.	.	.	.	.
Combined NC, NE, C, WC, EC, SC and SE Districts	8.4	.	.	.	.	6.5	77.4	1.4	17.2	.	.	5.1	60.2
Total	95.0	23.8	25.0	15.9	16.7	84.2	88.6	23.5	24.7	10.0	10.5	62.2	65.5
Sunflower													
North Central	246.0	213.1	86.6	.	.	238.5	97.0	164.5	66.9	90.5	36.8	2.7	1.1
Northeast	140.5	127.0	90.4	1.6	1.1	134.7	95.8	71.1	50.6	54.4	38.7	37.0	26.3
West Central	88.5	79.1	89.4	.	.	79.1	89.4	42.9	48.5	7.0	7.9	.	.
Central	125.5	123.7	98.6	.	.	106.6	85.0	61.7	49.2	41.5	33.0	8.2	6.6
East Central	43.0	43.0	100.0	2.2	5.1	36.7	85.5	26.1	60.8	18.5	43.0	19.6	45.6
South Central	204.0	186.2	91.3	.	.	185.5	90.9	146.4	71.7	19.4	9.5	6.9	3.4
Southeast	87.5	79.4	90.8	.	.	81.5	93.1	38.5	44.0	15.9	18.2	8.3	9.4
Combined Northwest and Southwest Districts	180.0	175.7	97.6	15.9	8.8	175.1	97.3	123.1	68.4	17.3	9.6	17.8	9.9
Total	1115.0	1027.3	92.1	19.7	1.8	1037.7	93.1	674.2	60.5	264.5	23.7	100.5	9.0
Safflower													
Northwest	4.7	2.0	43.2	.	.	2.0	43.2	.	.	.	.	.	.
Southwest	10.8	3.6	33.3	1.6	14.8	8.8	81.5	.	.	.	.	.	.
Combined NC, NE, C, WC, SC, EC and SE Districts	6.3	6.1	96.8	1.4	22.2	6.1	96.8	.	.	1.4	22.2	.	.
Total	21.8	11.7	53.8	3.0	13.8	16.9	77.7	.	.	1.4	6.4	.	.

Table 3. Continued.

Crop/District	Acres Planted ¹	Pesticide-treated Acres ²											
		Total		On-farm		Herbicide		Insecticide		Fungicide		Desiccants	
		Treated seed 1000	%	Treated seed 1000	%	1000	%	1000	%	1000	%	1000	%
Flax													
Northwest	126.0	.	.	.	.	124.7	99.0	.	.	0.5	0.4	63.8	50.6
North Central	44.5	0.5	1.1	.	.	42.2	94.8	2.2	5.0	.	.	14.2	32.0
Northeast	25.8	0.9	3.6	0.9	3.6	25.5	98.9	.	.	.	.	5.4	21.0
West Central	56.0	1.5	2.6	.	.	54.4	97.1	.	.	2.2	3.9	27.4	48.9
Central	48.7	1.7	3.5	1.7	3.5	37.4	76.9	1.0	2.2	.	.	6.3	12.9
Southwest	9.3	.	.	.	.	7.9	85.2	.	.	.	.	3.9	42.4
South Central	18.6	.	.	.	.	14.4	77.6	.	.	.	.	.	.
Combined East Central and Southeast Districts	6.1	.	.	.	.	2.3	37.1	.	.	.	.	1.4	23.4
Total	335.0	4.6	1.4	2.7	0.8	308.8	92.2	3.3	1.0	2.7	0.8	122.5	36.6
Canola													
Northwest	223.0	189.1	84.8	5.1	2.3	220.8	99.0	18.1	8.1	1.3	0.6	.	.
North Central	166.0	123.6	74.4	4.1	2.4	163.3	98.4	5.7	3.4	3.6	2.1	6.1	3.7
Northeast	352.0	287.1	81.6	4.6	1.3	341.9	97.1	3.9	1.1	165.8	47.1	12.8	3.6
West Central	78.0	56.1	72.0	2.7	3.5	78.0	100.0	.	.	1.6	2.0	.	.
Central	34.5	34.5	100.0	.	.	34.5	100.0	.	.	.	.	.	.
East Central	4.5	3.2	71.7	.	.	4.5	100.0	.	.	.	.	.	.
Southwest	43.0	34.4	80.1	2.2	5.0	43.0	100.0	.	.	.	.	2.2	5.0
Combined South Central and Southeast Districts	9.0	.	.	.	.	.	.	.	.	.	.	.	.
Total	910.0	728.1	80.0	18.6	2.0	886.0	97.4	27.7	3.0	172.2	18.9	21.0	2.3
Mustard													
Northwest	23.3	20.1	86.1	.	.	9.9	42.6	.	.	.	.	.	.
West Central	7.3	.	.	.	.	.	.	.	.	.	.	.	.
Southwest	3.2	.	.	.	.	.	.	.	.	.	.	.	.
Combined NC, NE, C, EC, SC and SE Districts	3.5	1.0	28.6	.	.	0.1	2.9	.	.	.	.	.	.
Total	37.3	21.1	56.4	.	.	10.0	26.9	.	.	.	.	.	.
Crambe													
Northwest	0.2	.	.	.	.	.	.	.	.	.	.	.	.
All other districts combined	.	.	.	.	.	.	.	.	.	.	.	.	.
Total	0.2	.	.	.	.	.	.	.	.	.	.	.	.
Sugarbeet													
Northeast	127.0	120.6	95.0	2.1	1.6	126.1	99.3	83.4	65.7	122.1	96.1	.	.
East Central	43.5	39.4	90.6	1.7	3.9	43.5	100.0	5.4	12.5	33.4	76.9	.	.
Southeast	29.2	22.2	75.9	.	.	26.7	91.3	1.2	4.1	17.8	60.8	.	.
Combined NW, NC, WC, C, SW and SC Districts	8.3	2.1	25.3	2.1	25.3	2.1	25.3	2.1	25.3	.	.	.	.
Total	208.0	184.3	88.6	5.9	2.8	198.4	95.4	92.2	44.3	173.3	83.3	.	.
Potato													
Northeast	61.1	44.0	72.1	44.0	72.1	39.7	64.9	57.8	94.6	61.1	100.0	61.1	100.0
Central	8.5	.	.	.	.	.	.	.	.	.	.	.	.
Southeast	5.2	.	.	.	.	.	.	.	.	.	.	.	.
Combined NW, NC, WC, EC, SW and SC Districts	7.2	3.7	51.4	3.7	51.4	3.7	51.4	.	.	3.7	51.4	3.7	54.4
Total	82.0	47.7	58.2	47.7	58.2	43.4	52.9	57.8	70.5	64.8	79.0	64.8	79.0

Table 3. Continued.

Crop/District	Acres Planted ¹	Pesticide-treated Acres ²											
		Total		On-farm		Herbicide		Insecticide		Fungicide		Desiccants	
		1000	Treated seed 1000	%	1000	%	1000	%	1000	%	1000	%	1000
Alfalfa													
Northwest	160	.	.	.	.	0.1	0.0	.	.	.	.	.	.
North Central	129	.	.	.	.	1.5	1.2	0.5	0.4	.	.	.	.
Northeast	35	.	.	.	.	.	.	1.7	4.8	.	.	.	.
West Central	239	.	.	.	.	1.0	0.4	.	.	.	.	.	.
Central	223	.	.	.	.	1.4	0.6	.	.	.	.	.	.
East Central	46	.	.	.	.	1.0	2.2	.	.	.	.	.	.
Southwest	307	.	.	.	.	0.3	0.1	0.6	0.2	.	.	.	.
South Central	358	.	.	.	.	1.3	0.4	.	.	.	.	.	.
Southeast	163	.	.	.	.	1.0	0.6	4.3	2.6	.	.	.	.
Total	1660	.	.	.	.	7.5	0.5	7.1	0.4	.	.	.	.
Other hay													
Northwest	146	.	.	.	.	1.1	0.8	.	.	.	.	.	.
North Central	274	.	.	.	.	12.6	4.6	.	.	.	.	.	.
Northeast	60	.	.	.	.	0.8	1.3	.	.	.	.	.	.
West Central	234	.	.	.	.	2.3	1.0	.	.	.	.	.	.
Central	193	.	.	.	.	6.5	3.4	.	.	.	.	.	.
East Central	38	.	.	.	.	0.3	0.9	.	.	.	.	.	.
Southwest	188	.	.	.	.	6.2	3.3	.	.	.	.	.	.
South Central	264	.	.	.	.	6.3	2.4	.	.	.	.	.	.
Southeast	163	.	.	.	.	0.7	0.5	.	.	.	.	.	.
Total	1560	.	.	.	.	37.0	2.4	.	.	.	.	.	.
CRP													
Northwest	302.3	.	.	.	.	18.7	6.2	.	.	.	.	.	.
North Central	409.6	.	.	.	.	100.9	24.6	.	.	.	.	.	.
Northeast	553.2	.	.	.	.	77.1	13.9	.	.	.	.	.	.
West Central	126.2	.	.	.	.	0.5	0.4	.	.	.	.	.	.
Central	422.7	.	.	.	.	68.9	16.3	0.1	0.0	.	.	.	.
East Central	247.7	.	.	.	.	31.7	12.8	.	.	.	.	.	.
Southwest	391.1	.	.	.	.	28.1	7.2	.	.	.	.	.	.
South Central	221.0	.	.	.	.	11.5	5.2	.	.	.	.	.	.
Southeast	339.2	.	.	.	.	53.5	15.8	.	.	.	.	.	.
Total	3013.0	.	.	.	.	390.9	13.0	0.1	0.0	.	.	.	.
Pasture													
Northwest	1119.8	.	.	.	.	23.3	2.1	.	.	.	.	.	.
North Central	733.6	.	.	.	.	48.3	6.6	0.5	0.1	.	.	.	.
Northeast	183.6	.	.	.	.	8.7	4.8	.	.	.	.	.	.
West Central	1902.4	.	.	.	.	3.6	0.2	.	.	0.5	0.0	.	.
Central	828.6	.	.	.	.	29.8	3.6	.	.	.	.	.	.
East Central	173.5	.	.	.	.	4.7	2.7	0.5	0.3	.	.	.	.
Southwest	2320.4	.	.	.	.	32.5	1.4	.	.	.	.	.	.
South Central	2331.2	.	.	.	.	21.5	0.9	3.4	0.1	.	.	.	.
Southeast	825.9	.	.	.	.	40.8	4.9	.	.	.	.	.	.
Total	10419.0	.	.	.	.	213.1	2.0	4.4	0.0	0.5	0.0	.	.
Fallow													
Northwest	130.7	.	.	.	.	98.4	75.3	.	.	.	.	.	.
North Central	70.0	.	.	.	.	16.0	22.9	.	.	.	.	.	.
West Central	64.6	.	.	.	.	20.7	32.1	.	.	.	.	.	.
Central	65.2	.	.	.	.	26.4	40.5	.	.	.	.	.	.
Southwest	40.6	.	.	.	.	4.0	9.7	.	.	.	.	.	.
South Central	27.4	.	.	.	.	9.2	33.7	.	.	.	.	.	.
Southeast	123.8	.	.	.	.	47.3	38.2	.	.	.	.	.	.
Combined. NE, EC Dist.	200.7	.	.	.	.	36.2	18.0	.	.	.	.	.	.
Total	723.0	.	.	.	.	258.2	35.7	.	.	.	.	.	.

¹ Preliminary estimates by the National Agricultural Statistics Service with the following exceptions: Pasture acreage was taken from the 2007 census. Acreage for mustard, safflower, crambe, summer fallow and CRP were taken from Farm Service Agency data.

² Multiple applications to the same acreage were totaled as one application within a pesticide group, . = no data reported.

Table 4. ON-FARM SEED TREATMENT BY CROP: Acres treated, percent of crop and method of application for North Dakota, 2008.

Treatment	Acres Seeded ¹ 1000	Acres Seeded %	Treatment Method		
			Drill box %	Auger %	Other %
Wheat					
Carboxin	135.9	1.5	2.3	97.7	.
Carboxin + Imazalil + Thiabendazole	29.9	0.3	.	100.0	.
Carboxin + Maneb + Lindane	44.2	0.5	6.4	93.6	.
Carboxin + Thiram	28.8	0.3	11.9	55.4	32.7
Chlorpyrifos	17.9	0.2	26.8	48.1	25.0
Difenoconazole	244.7	2.7	10.9	89.1	.
Imidacloprid	30.3	0.3	.	100.0	.
Maneb + Lindane	215.1	2.3	7.9	89.0	3.1
Tebuconazole + Metalaxyl	1370.1	14.8	5.8	89.4	4.8
Tebuconazole + Metalaxyl + Imazalil	594.6	6.4	4.2	94.2	1.6
Triticonazole + Thiram	108.6	1.2	.	68.0	32.0
Unknown or Other Seed Treatment	683.6	7.4	18.3	69.6	12.1
Total	3503.8	38.0	8.2	85.7	6.1
Barley					
Carboxin	37.4	2.3	26.3	73.7	.
Carboxin + Maneb + Lindane	13.1	0.8	.	100.0	.
Difenoconazole	9.4	0.6	79.4	20.6	.
Maneb + Lindane	59.8	3.6	2.1	86.0	12.0
Tebuconazole + Metalaxyl	303.1	18.4	2.9	92.3	4.7
Tebuconazole + Metalaxyl + Imazalil	69.7	4.2	8.9	87.5	3.6
Unknown or Other Seed Treatment	229.4	13.9	35.3	55.1	9.6
Total	722.0	43.8	15.9	77.7	6.4
Oat					
Tebuconazole + Metalaxyl	4.1	1.3	.	100.0	.
Unknown or Other Seed Treatment	4.4	1.4	12.9	59.7	27.4
Total	8.4	2.6	6.7	79.1	14.2
Soybean					
Fludioxonil + Mefenoxam	122.8	3.2	.	89.2	10.8
Thiamethoxam + Fludioxonil + Mefenoxam	3.6	0.1	.	39.8	60.2
Trifloxystrobin + Metalaxyl	38.8	1.0	.	8.4	91.6
Unknown or Other Seed Treatment	142.8	3.8	14.1	49.2	36.7
Total	308.0	8.1	6.5	59.9	33.6
Field pea					
Fludioxonil + Mefenoxam	23.2	4.5	3.0	88.0	8.9
Unknown or Other Seed Treatment	59.0	11.3	3.5	76.0	20.5
Total	82.3	15.8	3.4	79.4	17.2
Flax					
Unknown or Other Seed Treatment	2.7	0.8	35.3	.	64.7
Total	2.7	0.8	35.3	.	64.7
Canola					
Clothianidin	110.5	12.1	.	22.3	77.7
Imidacloprid	49.6	5.5	4.3	.	95.7
Thiamethoxam	6.5	0.7	.	.	100.0
Thiamethoxam + Fludioxonil + Mefenoxam	12.1	1.3	22.6	.	77.4
Thiamethoxam + Mefenoxam + Fludioxonil + Difenoconazole	261.1	28.7	7.6	4.3	88.1
Unknown or Other Seed Treatment	292.2	32.1	4.9	6.5	88.6
Total	732.1	80.5	5.3	7.5	87.2

Table 4. Continued.

Treatment	Acres Seeded ¹ 1000	Acres Seeded %	Treatment Method		
			Drill box %	Auger %	Other %
Potato					
Unknown or Other Seed Treatment	65.8	80.3	.	40.0	60.0
Total	65.8	80.3	.	40.0	60.0

¹ Acres reported seeded with treated seed include multiple applications to the same seed and seed treatment products applied as a tank-mixture were totaled separately unless as a commercial premix.

. = no data reported.

Table 5. ON-FARM SEED TREATMENT BY ACTIVE INGREDIENT: Total acres treated, percent of surveyed crops and method of application, North Dakota, 2008.

Treatment	Acres Seeded ¹ 1000	Acres Seeded %	Treatment Method		
			Drill box %	Auger %	Other %
Captan	8.6	0.1	2.2	97.8	.
Carboxin	176.6	1.2	7.4	92.6	.
Carboxin + Imazalil + Thiabendazole	32.3	0.3	3.8	96.2	.
Carboxin + Maneb + Lindane	57.4	0.5	4.9	95.1	.
Carboxin + Thiram	30.5	0.3	16.8	52.3	30.9
Chlorpyrifos	20.3	0.2	23.6	42.4	34.0
Clothianidin	142.7	1.2	.	34.4	65.6
Diazinon	20.5	0.2	43.0	57.0	.
Difenoconazole	257.8	2.2	13.2	85.3	1.4
Fludioxonil + Mefenoxam	146.1	3.4	0.5	89.0	10.5
Imidacloprid	95.3	0.6	2.3	38.0	59.8
Mancozeb	28.7	0.3	3.0	97.0	.
Maneb + Lindane	276.1	2.4	6.9	88.1	5.0
Metalaxyl	32.5	0.2	.	59.6	40.4
Tebuconazole + Metalaxyl	1691.0	10.6	5.2	89.3	5.5
Tebuconazole + Metalaxyl + Imazalil	666.5	5.7	4.7	93.2	2.1
Thiamethoxam	11.6	0.2	8.4	35.3	56.2
Thiamethoxam + Fludioxonil + Mefenoxam	26.3	0.2	10.4	45.8	43.8
Thiamethoxam + Mefenoxam + Fludioxonil + Difenoconazole	261.1	28.7	7.6	4.3	88.1
Thiram	14.5	0.1	.	95.0	5.0
Trifloxystrobin + Metalaxyl	38.8	1.0	.	8.4	91.6
Triticonazole + Thiram	115.8	1.1	4.0	66.0	30.0
Unknown or Other Seed Treatment	1274.3	7.6	17.6	49.6	32.8
Total	5425.1	32.2	8.6	71.9	19.5

¹ Acres reported seeded with treated seed include multiple applications to the same seed and seed treatment products applied as a tank-mixture were totaled separately unless as a commercial premix.

. = no data reported

Table 6. WHEAT: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2008.¹

	Acres treated ²	Acres treated	Applications					Operator/ Applicator		Method of Application	
			1x	2x	3x	4x	5x	Farm	Custom	Aerial	Ground
	1000	%	%	%	%	%	%	%	%	%	%
Herbicide											
2,4-D	1279.5	13.9	96.5	0.1	3.3	.	.	95.6	4.4	0.1	99.9
2,4-D-ester	15.1	0.2	100.0	.	.	.	.	100.0	.	.	100.0
Bromoxynil + Pyrasulfotole + Mefenpyr	750.2	8.1	100.0	.	.	.	.	87.0	13.0	0.8	99.2
Bromoxynil	10.2	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Bromoxynil + 2,4-D	82.8	0.9	100.0	.	.	.	.	92.7	7.3	.	100.0
Bromoxynil + Fluroxypyr	14.3	0.2	100.0	.	.	.	.	41.4	58.6	.	100.0
Bromoxynil + MCPA	1949.3	21.1	100.0	.	.	.	.	86.0	14.0	4.7	95.3
Clodinafop-propargyl	892.6	9.7	100.0	.	.	.	.	95.5	4.5	5.3	94.7
Clopyralid + 2,4-D	13.0	0.1	100.0	.	.	.	.	73.8	26.2	56.1	43.9
Clopyralid + Fluroxypyr	3098.6	33.6	99.6	0.4	.	.	.	91.6	8.4	1.3	98.7
Dicamba	292.6	3.2	100.0	.	.	.	.	90.9	9.1	1.0	99.0
Dicamba + 2,4-D	29.4	0.3	100.0	.	.	.	.	100.0	.	.	100.0
Fenoxaprop + Pyrasulfotole + Bromoxynil +Mefenprop	47.2	0.5	100.0	.	.	.	.	89.5	10.5	1.7	98.3
Fenoxaprop-p + Bromoxynil + MCPA	3.9	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Fenoxaprop-p ethyl ester	3045.0	33.0	98.0	1.3	0.7	.	.	86.4	13.6	0.4	99.6
Flucarbazone sodium	963.7	10.4	100.0	.	.	.	.	91.9	8.1	2.2	97.8
Fluroxypyr	235.0	2.5	100.0	.	.	.	.	96.4	3.6	.	100.0
Fluroxypyr + 2,4-D	40.2	0.4	100.0	.	.	.	.	29.1	70.9	.	100.0
Fluroxypyr + MCPA	77.5	0.8	100.0	.	.	.	.	72.8	27.2	0.1	99.9
Glyphosate	553.4	6.0	97.1	2.9	.	.	.	84.5	15.5	1.8	98.2
MCPA	748.8	8.1	99.6	0.4	.	.	.	86.6	13.4	2.0	98.0
Mesosulfuron	32.8	0.4	100.0	.	.	.	.	83.2	16.8	.	100.0
Mesosulfuron + Propoxycarbazone	207.7	2.3	100.0	.	.	.	.	83.2	16.8	.	100.0
Metsulfuron-methyl	16.3	0.2	100.0	.	.	.	.	90.2	9.8	.	100.0
Pinoxaden	863.2	9.4	99.4	.	0.6	.	.	90.3	9.7	0.6	99.4
Sethoxydim	37.7	0.4	100.0	.	.	.	.	90.5	9.5	.	100.0
Thifensulfuron methyl	114.3	1.2	100.0	.	.	.	.	96.2	3.8	.	100.0
Thifensulfuron methyl + Tribenuron-methyl	1416.2	15.3	100.0	.	.	.	.	88.9	11.1	1.4	98.6
Tralkoxydim	15.6	0.2	100.0	.	.	.	.	100.0	.	.	100.0
Tribenuron-methyl	50.3	0.5	100.0	.	.	.	.	96.4	3.6	3.6	96.4
Unknown or Other Herbicide	1051.1	11.4	97.8	1.9	0.3	.	.	71.0	29.0	7.6	92.4
Total	17949.4	194.5	99.1	0.5	0.4	.	.	88.2	11.8	2.0	98.0
Insecticide											
Chlorpyrifos	289.8	3.1	100.0	.	.	.	.	69.5	30.5	28.1	71.9
Dimethoate	5.8	0.1	100.0	.	.	.	.	65.0	35.0	.	100.0
Esfenvalerate	28.6	0.3	100.0	.	.	.	.	83.5	16.5	.	100.0
Lambda-cyhalothrin	119.6	1.3	100.0	.	.	.	.	95.3	4.7	2.5	97.5
Malathion	5.2	0.1	87.7	12.3	.	.	.	100.0	.	.	100.0
Methyl Parathion	50.9	0.6	100.0	.	.	.	.	64.6	35.4	35.4	64.6
Unknown or Other Insecticide	218.5	2.4	95.3	4.7	.	.	.	76.8	23.2	5.1	94.9
Total	718.4	7.8	98.5	1.5	.	.	.	76.4	23.6	15.8	84.2
Fungicide											
Propiconazole	1244.4	13.5	98.8	1.2	.	.	.	88.5	11.5	3.3	96.7
Propiconazole + Azoxystrobin	58.8	0.6	100.0	.	.	.	.	93.1	6.9	.	100.0
Propiconazole + Trifloxystrobin	243.9	2.6	89.9	3.7	.	6.4	.	84.4	15.6	0.5	99.5
Prothioconazole	405.5	4.4	96.0	4.0	.	.	.	70.2	29.8	23.6	76.4
Prothioconazole + Tebuconazole	9.7	0.1	100.0	.	.	.	.	37.4	62.6	.	100.0
Pyraclostrobin	1086.1	11.8	92.2	7.5	0.3	.	.	83.8	16.2	6.6	93.4
Tebuconazole	1014.0	11.0	93.3	6.7	.	.	.	71.8	28.2	22.1	77.9
Unknown or Other Fungicide	532.1	5.8	99.7	0.3	.	.	.	71.7	28.3	5.8	94.2
Total	4594.5	49.8	95.4	4.2	0.1	0.3	.	79.9	20.1	10.1	89.9
Desiccant											
Glyphosate	543.7	5.9	100.0	.	.	.	.	82.1	17.9	12.7	87.3
Unknown or Other Desiccant	37.4	0.4	100.0	.	.	.	.	50.7	49.3	45.1	54.9
Total	581.1	6.3	100.0	.	.	.	.	80.1	19.9	14.7	85.3

¹ Pesticides applied as a tank-mixture were considered separately unless a commercial premix was used. . = no data reported.

² Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.

Table 7. BARLEY: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2008.¹

	Acres treated ²	Acres treated	Applications					Operator/ Applicator		Method of Application	
			1x	2x	3x	4x	5x	Farm	Custom	Aerial	Ground
	1000	%	%	%	%	%	%	%	%	%	
Herbicide											
2,4-D	187.5	11.4	100.0	.	.	.	.	95.9	4.1	.	100.0
Bromoxynil + Pyrasulfotole + Mefenpyr	82.0	5.0	100.0	.	.	.	.	90.6	9.4	.	100.0
Bromoxynil + MCPA	311.4	18.9	100.0	.	.	.	.	91.1	8.9	0.2	99.8
Clodinafop-propargyl	9.8	0.6	100.0	.	.	.	.	100.0	.	.	100.0
Clopyralid + Fluroxypyr	594.0	36.0	100.0	.	.	.	.	92.2	7.8	0.5	99.5
Fenoxaprop-p ethyl ester	414.6	25.1	100.0	.	.	.	.	88.2	11.8	1.7	98.3
Flucarbazone sodium	7.2	0.4	100.0	.	.	.	.	100.0	.	.	100.0
Fluroxypyr	25.8	1.6	100.0	.	.	.	.	94.1	5.9	.	100.0
Fluroxypyr + MCPA	10.3	0.6	100.0	.	.	.	.	43.2	56.8	.	100.0
Glyphosate	59.3	3.6	77.2	.	22.8	.	.	91.2	8.8	1.2	98.8
MCPA	117.6	7.1	100.0	.	.	.	.	85.9	14.1	.	100.0
Pinoxaden	536.5	32.5	100.0	.	.	.	.	90.0	10.0	5.0	95.0
Thifensulfuron methyl	5.0	0.3	100.0	.	.	.	.	77.9	22.1	.	100.0
Thifensulfuron methyl + Tribenuron-methyl	272.0	16.5	100.0	.	.	.	.	93.0	7.0	.	100.0
Unknown or Other Herbicide	215.4	13.1	93.7	.	6.3	.	.	87.8	12.2	0.2	99.8
Total	2848.4	172.6	99.1	.	0.9	.	.	90.6	9.4	1.3	98.7
Insecticide											
Methyl Parathion	19.5	1.2	100.0	.	.	.	.	31.9	68.1	55.1	44.9
Unknown or Other Insecticide	28.4	1.7	100.0	.	.	.	.	90.7	9.3	9.3	90.7
Total	47.8	2.9	100.0	.	.	.	.	66.8	33.2	27.9	72.1
Fungicide											
Propiconazole	177.8	10.8	100.0	.	.	.	.	86.8	13.2	.	100.0
Propiconazole + Azoxystrobin	18.7	1.1	100.0	.	.	.	.	91.9	8.1	.	100.0
Propiconazole + Trifloxystrobin	42.6	2.6	100.0	.	.	.	.	98.6	1.4	1.4	98.6
Prothioconazole	36.0	2.2	100.0	.	.	.	.	82.8	17.2	8.3	91.7
Pyraclostrobin	172.5	10.5	100.0	.	.	.	.	87.5	12.5	5.9	94.1
Tebuconazole	52.2	3.2	100.0	.	.	.	.	67.0	33.0	26.8	73.2
Unknown or Other Fungicide	73.9	4.5	100.0	.	.	.	.	91.9	8.1	2.1	97.9
Total	573.6	34.8	100.0	.	.	.	.	86.7	13.3	5.1	94.9
Desiccant											
Glyphosate	17.8	1.1	100.0	.	.	.	.	100.0	.	.	100.0
Total	17.8	1.1	100.0	.	.	.	.	100.0	.	.	100.0

¹ Pesticides applied as a tank-mixture were considered separately unless a commercial premix was used. . = no data reported.

² Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.

Table 8. OAT: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2008.¹

	Acres treated ²	Acres treated	Applications					Operator/ Applicator		Method of Application	
			1x	2x	3x	4x	5x	Farm	Custom	Aerial	Ground
	1000	%	%	%	%	%	%	%	%	%	%
Herbicide											
2,4-D	52.4	16.4	100.0	.	.	.	.	84.4	15.6	.	100.0
Bromoxynil + MCPA	18.6	5.8	100.0	.	.	.	.	95.4	4.6	.	100.0
Clopyralid + Fluroxypyr	12.5	3.9	100.0	.	.	.	.	73.6	26.4	.	100.0
Dicamba	9.6	3.0	100.0	.	.	.	.	94.4	5.6	6.7	93.3
Glyphosate	13.3	4.2	100.0	.	.	.	.	79.1	20.9	.	100.0
MCPA	29.8	9.3	100.0	.	.	.	.	84.7	15.3	.	100.0
Unknown or Other Herbicide	19.1	6.0	100.0	.	.	.	.	74.7	25.3	5.6	94.4
Total	155.3	48.5	100.0	.	.	.	.	83.9	16.1	1.1	98.9
Insecticide											
Unknown or Other Insecticide	0.6	0.2	100.0	.	.	.	.	100.0	.	.	100.0
Total	0.6	0.2	100.0	.	.	.	.	100.0	.	.	100.0
Fungicide											
Propiconazole	3.4	1.0	100.0	.	.	.	.	100.0	.	.	100.0
Unknown or Other Fungicide	4.1	1.3	100.0	.	.	.	.	100.0	.	.	100.0
Total	7.4	2.3	100.0	.	.	.	.	100.0	.	.	100.0
Desiccant											
Unknown or Other Desiccant	3.7	1.2	100.0	.	.	.	.	100.0	.	.	100.0
Total	3.7	1.2	100.0	.	.	.	.	100.0	.	.	100.0

¹ Pesticides applied as a tank-mixture were considered separately unless a commercial premix was used. . = no data reported.

² Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.

Table 9. CORN: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2008.¹

	Acres treated ² 1000	Acres treated %	Applications					Operator/ Applicator		Method of Application	
			1x %	2x %	3x %	4x %	5x %	Farm %	Custom %	Aerial %	Ground %
Herbicide											
2,4-D	5.8	0.2	100.0	.	.	.	.	80.6	19.4	.	100.0
Acetochlor	66.7	2.6	100.0	.	.	.	.	55.0	45.0	2.0	98.0
Acetochlor + Dichlormid + Atrazine	41.9	1.6	100.0	.	.	.	.	100.0	.	.	100.0
Atrazine	59.5	2.3	100.0	.	.	.	.	66.7	33.3	.	100.0
Bromoxynil	30.0	1.2	91.3	8.7	.	.	.	91.3	8.7	27.7	72.3
Clopyralid + Fluroxypyr	19.5	0.8	100.0	.	.	.	.	94.9	5.1	.	100.0
Dicamba	170.1	6.7	78.7	21.3	.	.	.	95.5	4.5	.	100.0
Diflufenzopyr-sodium + Dicamba	276.4	10.8	64.5	2.4	.	33	.	89.3	10.7	.	100.0
Dimethenamid-P	83.8	3.3	98.0	2.0	.	.	.	80.6	19.4	.	100.0
Foramsulfuron	14.8	0.6	100.0	.	.	.	.	64.3	35.7	.	100.0
Glufosinate-ammonium	34.1	1.3	24.6	75.4	.	.	.	81.8	18.2	.	100.0
Glyphosate	3591.7	140.8	39.1	57.2	3.6	0.1	.	86.8	13.2	1.4	98.6
Mesotrione	22.9	0.9	92.1	7.9	.	.	.	85.6	14.4	.	100.0
Nicosulfuron + Rimsulfuron	17.8	0.7	100.0	.	.	.	.	76.7	23.3	.	100.0
S-Metolachlor + Atrazine + Mesotrione	21.8	0.9	100.0	.	.	.	.	85.8	14.2	.	100.0
Tembotrione	28.3	1.1	100.0	.	.	.	.	65.8	34.2	.	100.0
Unknown or Other Herbicide	200.4	7.9	82.2	17.8	.	.	.	61.2	38.8	1.2	98.8
Total	4685.4	183.7	49.0	46.2	2.8	2.0	.	85.2	14.8	1.4	98.6
Insecticide											
Lambda-cyhalothrin	19.4	0.8	100.0	.	.	.	.	71.2	28.8	71.5	28.5
Unknown or Other Insecticide	66.3	2.6	100.0	.	.	.	.	58.7	41.3	35.4	64.6
Total	85.7	3.4	100.0	.	.	.	.	61.6	38.4	43.6	56.4
Fungicide											
Pyraclostrobin	91.5	3.6	100.0	.	.	.	.	36.8	63.2	66.3	33.7
Unknown or Other Fungicide	14.4	0.6	100.0	.	.	.	.	31.9	68.1	40.9	59.1
Total	105.9	4.2	100.0	.	.	.	.	36.2	63.8	62.9	37.1
Desiccant											
Unknown or Other Desiccant	0.2	0.0	.	100	.	.	.	100.0	.	.	100.0
Total	0.2	0.0	.	100	.	.	.	100.0	.	.	100.0

¹ Pesticides applied as a tank-mixture were considered separately unless a commercial premix was used. . = no data reported.

² Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.

Table 10. GENETICALLY MODIFIED CORN: Types and acres grown in North Dakota, 2008.¹

District	Corn acres 1000	Bt-insect		Glyphosate		Liberty		Clearfield ²		Stacked gene		Bt-rootworm	
		Acres Used 1000	%	Acres Used 1000	%	Acres Used 1000	%	Acres Used 1000	%	Acres Used 1000	%	Acres Used 1000	%
Northwest	22.0	3.2	14.4	15.0	68.1	.	.	.	.	3.5	16.0	.	.
North Central	114.0	.	.	50.7	44.4	.	.	0.6	0.5	62.0	54.4	0.8	0.7
Northeast	280.0	1.7	0.6	134.7	48.1	.	.	.	.	135.7	48.4	0.3	0.1
West Central	63.0	.	.	37.8	60.0	.	.	.	.	23.6	37.4	.	.
Central	315.0	3.2	1.0	127.2	40.4	1.9	0.6	.	.	175.0	55.6	0.9	0.3
East Central	680.0	6.0	0.9	328.1	48.3	4.9	0.7	5.5	0.8	322.5	47.4	4.1	0.6
Southwest	58.0	.	.	46.9	80.9	.	.	.	.	10.8	18.5	.	.
South Central	148.0	1.2	0.8	92.6	62.6	0.2	0.2	.	.	48.0	32.4	2.8	1.9
Southeast	870.0	48.5	5.6	381.2	43.8	8.6	1.0	3.8	0.4	391.9	45.1	4.2	0.5
State Total	2550.0	63.8	2.5	1214.2	47.6	15.6	0.6	9.9	0.4	1172.9	46.0	13.0	0.5

¹ . = no data reported.

² The Clearfield trait was developed using natural selection and traditional plant breeding, and is not genetically modified (GMO).

Table 11. SOYBEAN: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2008.¹

	Acres treated ²	Acres treated	Applications					Operator/ Applicator		Method of Application	
			1x	2x	3x	4x	5x	Farm	Custom	Aerial	Ground
	1000	%	%	%	%	%	%	%	%	%	%
Herbicide											
Bentazon	12.9	0.3	93.0	7.0	.	.	.	100.0	.	.	100.0
Clethodim	91.1	2.4	99.0	1.0	.	.	.	89.3	10.7	.	100.0
Cloransulam-methyl	19.9	0.5	100.0	.	.	.	.	50.0	50.0	.	100.0
Flumiclorac	6.5	0.2	100.0	.	.	.	.	63.5	36.5	.	100.0
Flumioxazin	107.9	2.8	100.0	.	.	.	.	61.9	38.1	.	100.0
Fomesafen	41.8	1.1	100.0	.	.	.	.	46.8	53.2	.	100.0
Glyphosate	6214.6	163.5	29.0	67.0	4.1	.	.	85.1	14.9	2.0	98.0
Imazamox	89.8	2.4	51.3	48.7	.	.	.	93.3	6.7	.	100.0
Imazethapyr	22.9	0.6	100.0	.	.	.	.	17.6	82.4	.	100.0
Imazethapyr + Glyphosate	42.6	1.1	100.0	.	.	.	.	92.2	7.8	.	100.0
Pendimethalin	18.1	0.5	100.0	.	.	.	.	93.7	6.3	.	100.0
Pendimethalin + Imazethapyr	11.5	0.3	100.0	.	.	.	.	100.0	.	.	100.0
Quizalofop-P-ethyl	24.4	0.6	73.8	26.2	.	.	.	100.0	.	.	100.0
Thifensulfuron methyl	16.8	0.4	100.0	.	.	.	.	90.8	9.2	.	100.0
Trifluralin	19.1	0.5	100.0	.	.	.	.	100.0	.	.	100.0
Unknown or Other Herbicide	126.3	3.3	86.4	13.6	.	.	.	84.0	16.0	1.8	98.2
Total	6866.2	180.7	34.7	61.6	3.7	.	.	84.5	15.5	1.9	98.1
Insecticide											
Bifenthrin + Zeta-Cypermethrin	30.3	0.8	100.0	.	.	.	.	82.7	17.3	.	100.0
Chlorpyrifos	968.5	25.5	87.2	12.8	.	.	.	54.5	45.5	27.3	72.7
Chlorpyrifos + Gamma-cyhalothrin	59.1	1.6	79.7	20.3	.	.	.	59.3	40.7	21.3	78.7
Cyfluthrin	137.9	3.6	85.7	14.3	.	.	.	57.4	42.6	.	100.0
Deltamethrin	79.9	2.1	93.8	6.2	.	.	.	54.0	46.0	1.2	98.8
Esfenvalerate	303.8	8.0	91.7	8.3	.	.	.	64.7	35.3	22.1	77.9
Gamma-cyhalothrin	61.0	1.6	87.8	12.2	.	.	.	69.2	30.8	6.6	93.4
Lambda-cyhalothrin	607.6	16.0	89.8	10.2	.	.	.	60.0	40.0	19.5	80.5
Unknown or Other Insecticide	340.2	9.0	96.1	3.9	.	.	.	63.0	37.0	19.4	80.6
Total	2588.3	68.1	89.6	10.4	.	.	.	59.0	41.0	20.6	79.4
Fungicide											
Prothioconazole	11.9	0.3	100.0	.	.	.	.	96.9	3.1	.	100.0
Pyraclostrobin	307.8	8.1	100.0	.	.	.	.	89.8	10.2	1.3	98.7
Tebuconazole	4.1	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Unknown or Other Fungicide	113.3	3.0	96.2	3.8	.	.	.	59.4	40.6	12.5	87.5
Total	437.1	11.5	99.0	1.0	.	.	.	82.2	17.8	4.2	95.8
Desiccant											
Unknown or Other Desiccant and Total	0.8	0.0	100.0	.	.	.	.	.	100.0	100.0	.

¹ Pesticides applied as a tank-mixture were considered separately unless a commercial premix was used. . = no data reported.

² Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.

Table 12. GENETICALLY MODIFIED SOYBEAN: Types and acres grown in North Dakota, 2008.

District	Soybean Acres	Glyphosate Resistant	
		Acres Used	%
	1000	1000	%
Northwest	20.8	20.8	100.0
North Central	171.0	160.6	93.9
Northeast	560.0	547.2	97.7
Central	680.0	670.4	98.6
East Central	1230.0	1195.1	97.2
South Central	28.0	28.0	100.0
Southeast	1105.0	1060.3	96.0
Combined WC and SW Districts	5.2	5.0	96.2
State Total	3800.0	3687.3	97.0

Table 13. DRY BEAN: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2008.¹

	Acres	Acres	Applications					Operator/ Applicator		Method of Application	
	treated ² 1000	treated %	1x %	2x %	3x %	4x %	5x %	Farm %	Custom %	Aerial %	Ground %
Herbicide											
Alachlor	9.3	1.4	100.0	.	.	.	.	100.0	.	.	100.0
Bentazon	579.6	87.8	56.2	43.8	.	.	.	93.5	6.5	.	100.0
Bentazon + Sethoxydim	53.5	8.1	46.1	53.9	.	.	.	89.1	10.9	15.8	84.2
Clethodim	38.6	5.8	37.4	62.6	.	.	.	91.8	8.2	.	100.0
Dimethenamid-P	61.6	9.3	17.7	82.3	.	.	.	100.0	.	.	100.0
Ethalfuralin	79.7	12.1	100.0	.	.	.	.	92.9	7.1	.	100.0
Fomesafen	103.9	15.7	58.2	41.8	.	.	.	89.3	10.7	.	100.0
Glyphosate	34.1	5.2	36.1	63.9	.	.	.	19.6	80.4	29.4	70.6
Halosulfuron	12.3	1.9	100.0	.	.	.	.	76.7	23.3	3.6	96.4
Imazamox	309.1	46.8	79.2	20.8	.	.	.	91.6	8.4	2.8	97.2
Imazethapyr	61.4	9.3	57.4	42.6	.	.	.	89.4	10.6	.	100.0
Pendimethalin	60.0	9.1	100.0	.	.	.	.	84.7	15.3	.	100.0
Quizalofop-P-ethyl	8.2	1.2	50.6	49.4	.	.	.	100.0	.	.	100.0
Sethoxydim	190.4	28.8	56.4	43.6	.	.	.	92.2	7.8	.	100.0
Thifensulfuron methyl + Tribenuron-methyl	20.2	3.1	100.0	.	.	.	.	84.3	15.7	.	100.0
Trifluralin	19.3	2.9	100.0	.	.	.	.	27.7	72.3	.	100.0
Unknown or Other Herbicide	197.2	29.9	64.9	31.9	3.2	.	.	71.7	28.3	6.0	94.0
Total	1838.2	278.5	63.6	36.1	0.3	.	.	87.8	12.2	2.1	97.9
Insecticide											
Esfenvalerate	16.8	2.5	100.0	.	.	.	.	82.9	17.1	2.6	97.4
Lambda-cyhalothrin	16.9	2.6	100.0	.	.	.	.	35.4	64.6	.	100.0
Unknown or Other Insecticide	20.1	3.0	100.0	.	.	.	.	67.7	32.3	6.2	93.8
Total	53.8	8.1	100.0	.	.	.	.	62.3	37.7	3.1	96.9
Fungicide											
Prothioconazole	134.7	20.4	32.9	62.4	4.7	.	.	73.9	26.1	23.8	76.2
Pyraclostrobin	96.8	14.7	100.0	.	.	.	.	91.0	9.0	2.2	97.8
Thiophanate	56.2	8.5	100.0	.	.	.	.	72.3	27.7	24.5	75.5
Unknown or Other Fungicide	53.0	8.0	71.3	16.8	12.0	.	.	81.7	18.3	4.9	95.1
Total	340.6	51.6	69.0	27.3	3.7	.	.	79.7	20.3	14.8	85.2
Desiccant											
Flumioxazin	63.5	9.6	100.0	.	.	.	.	70.1	29.9	29.0	71.0
Glyphosate	53.6	8.1	100.0	.	.	.	.	62.4	37.6	10.3	89.7
Paraquat	57.4	8.7	88.9	.	11.1	.	.	67.3	32.7	19.4	80.6
Unknown or Other Desiccant	89.4	13.5	100.0	.	.	.	.	55.5	44.5	31.1	68.9
Total	263.9	40.0	97.6	.	2.4	.	.	62.9	37.1	23.8	76.2

¹ Pesticides applied as a tank-mixture were considered separately unless a commercial premix was used. . = no data reported.

² Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.

Table 14. DRY PEA: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2008.¹

	Acres treated ²	Acres treated	Applications					Operator/ Applicator		Method of Application	
			1x	2x	3x	4x	5x	Farm	Custom	Aerial	Ground
	1000	%	%	%	%	%	%	%	%	%	%
Herbicide											
Bentazon	181.1	34.8	100.0	.	.	.	.	83.3	16.7	.	100.0
Bentazon + Sethoxydim	17.2	3.3	100.0	.	.	.	.	100.0	.	.	100.0
Clethodim	35.9	6.9	100.0	.	.	.	.	78.1	21.9	.	100.0
Ethalfuralin	9.2	1.8	100.0	.	.	.	.	65.9	34.1	27.0	73.0
Glyphosate	61.0	11.7	100.0	.	.	.	.	92.9	7.1	.	100.0
Imazamox	136.6	26.3	100.0	.	.	.	.	78.6	21.4	.	100.0
Pendimethalin	11.8	2.3	100.0	.	.	.	.	100.0	.	.	100.0
Quizalofop-P-ethyl	142.5	27.4	100.0	.	.	.	.	81.5	18.5	4.1	95.9
Sethoxydim	71.1	13.7	100.0	.	.	.	.	75.8	24.2	.	100.0
Sulfentrazone	63.3	12.2	100.0	.	.	.	.	64.2	35.8	.	100.0
Thifensulfuron methyl + Tribenuron-methyl	15.3	2.9	100.0	.	.	.	.	89.6	10.4	.	100.0
Unknown or Other Herbicide	87.2	16.8	97.1	2.9	.	.	.	87.9	12.1	.	100.0
Total	832.2	160.0	99.7	0.3	.	.	.	81.6	18.4	1.0	99.0
Insecticide											
Esfenvalerate	4.1	0.8	100.0	.	.	.	.	100.0	.	.	100.0
Lambda-cyhalothrin	22.4	4.3	100.0	.	.	.	.	100.0	.	.	100.0
Unknown or Other Insecticide	4.6	0.9	100.0	.	.	.	.	100.0	.	.	100.0
Total	31.1	6.0	100.0	.	.	.	.	100.0	.	.	100.0
Fungicide											
Propiconazole	8.4	1.6	100.0	.	.	.	.	100.0	.	.	100.0
Prothioconazole	4.1	0.8	100.0	.	.	.	.	100.0	.	.	100.0
Pyraclostrobin	47.9	9.2	100.0	.	.	.	.	72.7	27.3	.	100.0
Unknown or Other Fungicide	16.8	3.2	100.0	.	.	.	.	74.0	26.0	.	100.0
Total	77.2	14.8	100.0	.	.	.	.	77.4	22.6	.	100.0
Desiccant											
Glyphosate	34.6	6.7	100.0	.	.	.	.	59.7	40.3	.	100.0
Paraquat	84.6	16.3	100.0	.	.	.	.	52.2	47.8	5.9	94.1
Unknown or Other Desiccant	32.9	6.3	100.0	.	.	.	.	58.2	41.8	.	100.0
Total	152.1	29.2	100.0	.	.	.	.	55.2	44.8	3.3	96.7

¹ Pesticides applied as a tank-mixture were considered separately unless a commercial premix was used. . = no data reported.

² Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.

Table 15. LENTIL: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2008.¹

	Acres	Acres	Applications					Operator/ Applicator		Method of Application	
	treated ²	treated	1x	2x	3x	4x	5x	Farm	Custom	Aerial	Ground
	1000	%	%	%	%	%	%	%	%	%	%
Herbicide											
Glyphosate	9.6	10.1	100.0	.	.	.	.	100.0	.	.	100.0
Imazethapyr	5.3	5.5	100.0	.	.	.	.	81.4	18.6	.	100.0
Pendimethalin	12.7	13.4	100.0	.	.	.	.	58.7	41.3	.	100.0
Quizalofop-P-ethyl	65.7	69.2	100.0	.	.	.	.	92.1	7.9	.	100.0
Unknown or Other Herbicide	23.8	25.0	100.0	.	.	.	.	83.5	16.5	1.3	98.7
Total	117.1	123.3	100.0	.	.	.	.	86.9	13.1	0.3	99.7
Insecticide											
Lambda-cyhalothrin	7.8	8.2	100.0	.	.	.	.	100.0	.	.	100.0
Unknown or Other Insecticide	22.0	23.2	42.0	58.0	.	.	.	22.2	77.8	67.6	32.4
Total	29.9	31.4	57.2	42.8	.	.	.	42.6	57.4	49.8	50.2
Fungicide											
Unknown or Other Fungicide	10.0	10.5	100.0	.	.	.	.	94.0	6.0	.	100.0
Total	10.0	10.5	100.0	.	.	.	.	94.0	6.0	.	100.0
Desiccant											
Glyphosate	25.5	26.9	100.0	.	.	.	.	89.7	10.3	.	100.0
Paraquat	42.8	45.1	100.0	.	.	.	.	46.9	53.1	10.5	89.5
Unknown or Other Desiccant	5.3	5.5	100.0	.	.	.	.	100.0	.	.	100.0
Total	73.6	77.5	100.0	.	.	.	.	65.5	34.5	6.1	93.9

¹ Pesticides applied as a tank-mixture were considered separately unless a commercial premix was used. . = no data reported.

² Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.

Table 16. SUNFLOWER: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2008.¹

	Acres treated ²	Acres treated	Applications					Operator/ Applicator		Method of Application	
			1x	2x	3x	4x	5x	Farm	Custom	Aerial	Ground
	1000	%	%	%	%	%	%	%	%	%	%
Herbicide											
2,4-D	7.3	0.7	100.0	.	.	.	.	25.1	74.9	74.9	25.1
Carfentrazone-ethyl	59.5	5.3	100.0	.	.	.	.	72.7	27.3	.	100.0
Clethodim	354.3	31.8	95.6	4.4	.	.	.	85.5	14.5	5.7	94.3
Ethalfuralin	55.5	5.0	100.0	.	.	.	.	53.1	46.9	19.4	80.6
Glyphosate	257.9	23.1	92.5	7.5	.	.	.	81.5	18.5	0.9	99.1
Imazamethabenz	80.3	7.2	96.9	3.1	.	.	.	85.4	14.6	.	100.0
Imazamox	226.9	20.4	93.2	6.8	.	.	.	88.7	11.3	7.4	92.6
Pendimethalin	78.3	7.0	100.0	.	.	.	.	84.3	15.7	0.8	99.2
Quizalofop-P-ethyl	72.1	6.5	81.1	18.9	.	.	.	92.3	7.7	.	100.0
Sethoxydim	43.8	3.9	100.0	.	.	.	.	100.0	.	.	100.0
Sulfentrazone	457.5	41.0	100.0	.	.	.	.	85.4	14.6	0.3	99.7
Tribenuron-methyl	103.4	9.3	100.0	.	.	.	.	87.2	12.8	1.2	98.8
Trifluralin	28.7	2.6	100.0	.	.	.	.	84.6	15.4	.	100.0
Unknown or Other Herbicide	111.7	10.0	100.0	.	.	.	.	79.0	21.0	7.7	92.3
Total	1937.2	173.7	96.6	3.4	.	.	.	84.0	16.0	3.5	96.5
Insecticide											
Chlorpyrifos	40.1	3.6	100.0	.	.	.	.	42.2	57.8	42.8	57.2
Cyfluthrin	10.7	1.0	70.2	29.8	.	.	.	70.2	29.8	29.8	70.2
Deltamethrin	82.8	7.4	100.0	.	.	.	.	23.5	76.5	75.1	24.9
Esfenvalerate	397.0	35.6	97.7	2.3	.	.	.	38.3	61.7	55.7	44.3
Lambda-cyhalothrin	46.7	4.2	90.6	9.4	.	.	.	12.8	87.2	84.9	15.1
Zeta-cypermethrin	5.7	0.5	100.0	.	.	.	.	100.0	.	.	100.0
Unknown or Other Insecticide	170.7	15.3	86.7	13.3	.	.	.	51.3	48.7	54.7	45.3
Total	753.7	67.6	94.7	5.3	.	.	.	39.2	60.8	57.9	42.1
Fungicide											
Pyraclostrobin	143.7	12.9	99.5	0.5	.	.	.	27.6	72.4	65.0	35.0
Tebuconazole	59.2	5.3	100.0	.	.	.	.	62.0	38.0	26.5	73.5
Unknown or Other Fungicide	72.7	6.5	78.6	21.4	.	.	.	70.1	29.9	51.3	48.7
Total	275.7	24.7	94.1	5.9	.	.	.	46.2	53.8	53.1	46.9
Desiccant											
Glyphosate	63.1	5.7	100.0	.	.	.	.	42.5	57.5	51.4	48.6
Paraquat	18.2	1.6	100.0	.	.	.	.	60.5	39.5	39.5	60.5
Unknown or Other Desiccant	19.2	1.7	100.0	.	.	.	.	32.6	67.4	67.4	32.6
Total	100.5	9.0	100.0	.	.	.	.	43.8	56.2	52.3	47.7

¹ Pesticides applied as a tank-mixture were considered separately unless a commercial premix was used. . = no data reported.

² Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.

Table 17. GENETICALLY MODIFIED SUNFLOWER: Types and acres grown in North Dakota, 2008.¹

District	Sunflower Acres	Clearfield Resistant ¹		Express Resistant ¹	
		Acres Used	%	Acres Used	%
North Central	246.0	77.7	31.6	20.6	8.4
Northeast	140.5	17.1	12.2	46.4	33.0
West Central	88.5	24.9	28.1	5.9	6.7
Central	125.5	50.0	39.9	10.4	8.3
East Central	43.0	6.3	14.6	3.8	8.9
South Central	204.0	28.2	13.8	11.3	5.6
Southeast	87.5	8.6	9.8	15.2	17.3
Combined NW, SW Districts	180.0	23.7	13.2	0.2	0.1
State Total	1115.0	236.6	21.2	113.8	10.2

¹ The Clearfield and Express Sun traits were developed using natural selection and traditional plant breeding, and is not genetically modified (GMO).

Table 18. SAFFLOWER: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2008.¹

	Acres treated ²	Acres treated	Applications					Operator/ Applicator		Method of Application	
			1x	2x	3x	4x	5x	Farm	Custom	Aerial	Ground
	1000	%	%	%	%	%	%	%	%	%	%
Herbicide											
Sethoxydim	5.6	25.6	100.0	.	.	.	.	100.0	.	.	100.0
Unknown or Other Herbicide	22.4	102.5	100.0	.	.	.	.	100.0	.	.	100.0
Total	28.0	128.1	100.0	.	.	.	.	100.0	.	.	100.0
Fungicide											
Unknown or Other Fungicide	2.8	12.8	.	100.0	.	.	.	.	100.0	.	100.0
Total	2.8	12.8	.	100.0	.	.	.	.	100.0	.	100.0

¹ Pesticides applied as a tank-mixture were considered separately unless a commercial premix was used. . = no data reported.

² Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.

Table 19. FLAX: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2008.¹

	Acres treated ²	Acres treated	Applications					Operator/ Applicator		Method of Application	
			1x	2x	3x	4x	5x	Farm	Custom	Aerial	Ground
	1000	%	%	%	%	%	%	%	%	%	%
Herbicide											
Bromoxynil	6.2	1.9	100.0	.	.	.	.	100.0	.	.	100.0
Bromoxynil + MCPA	211.9	63.3	100.0	.	.	.	.	85.8	14.2	2.8	97.2
Clethodim	189.5	56.6	99.9	0.1	.	.	.	83.6	16.4	.	100.0
Glyphosate	24.1	7.2	86.2	13.8	.	.	.	83.7	16.3	.	100.0
MCPA	21.7	6.5	100.0	.	.	.	.	100.0	.	.	100.0
Quizalofop-P-ethyl	20.7	6.2	60.1	39.9	.	.	.	80.5	19.5	.	100.0
Sethoxydim	12.7	3.8	100.0	.	.	.	.	79.2	20.8	.	100.0
Sulfentrazone	10.1	3.0	100.0	.	.	.	.	76.7	23.3	.	100.0
Unknown or Other Herbicide	55.6	16.6	84.8	15.2	.	.	.	71.0	29.9	3.9	96.1
Total	552.4	164.9	96.3	3.7	.	.	.	83.7	16.3	1.5	98.5
Insecticide											
Unknown or Other Insecticide	4.2	1.2	58.1	41.9	.	.	.	41.9	58.1	33.0	67.0
Total	4.2	1.2	58.1	41.9	.	.	.	41.9	58.1	33.0	67.0
Fungicide											
Unknown or Other Fungicide	2.7	0.8	100.0	.	.	.	.	100.0	.	.	100.0
Total	2.7	0.8	100.0	.	.	.	.	100.0	.	.	100.0
Desiccant											
Glyphosate	108.7	32.4	100.0	.	.	.	.	53.9	46.1	3.3	96.7
Unknown or Other Desiccant	13.8	4.1	100.0	.	.	.	.	60.8	39.2	.	100.0
Total	122.5	36.6	100.0	.	.	.	.	54.7	45.3	2.9	97.1

¹ Pesticides applied as a tank-mixture were considered separately unless a commercial premix was used. . = no data reported.

² Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.

Table 20. CANOLA: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2008.¹

	Acres treated ²	Acres treated	Applications					Operator/ Applicator		Method of Application	
			1x	2x	3x	4x	5x	Farm	Custom	Aerial	Ground
	1000	%	%	%	%	%	%	%	%	%	%
Herbicide											
Clethodim	123.6	13.6	100.0	.	.	.	.	89.0	11.0	5.2	94.8
Glufosinate-ammonium	354.3	38.9	99.4	0.6	.	.	.	90.2	9.8	1.8	98.2
Glyphosate	660.3	72.6	58.0	42.1	.	.	.	88.9	11.1	3.8	96.2
Imazamox	21.2	2.3	48.4	51.6	.	.	.	89.1	10.9	.	100.0
Quizalofop-P-ethyl	31.7	3.5	100.0	.	.	.	.	100.0	.	.	100.0
Unknown or Other Herbicide	29.2	3.2	100.0	.	.	.	.	100.0	.	.	100.0
Total	1220.3	134.1	76.2	23.8	.	.	.	89.8	10.2	3.1	96.9
Insecticide											
Bifenthrin	11.2	1.2	100.0	.	.	.	.	8.6	91.4	91.4	8.6
Unknown or Other Insecticide	17.8	2.0	84.7	15.3	.	.	.	68.0	32.0	7.7	92.3
Total	29.1	3.2	90.6	9.4	.	.	.	45.0	55.0	40.0	60.0
Fungicide											
Prothioconazole	45.8	5.0	100.0	.	.	.	.	83.7	16.3	13.9	86.1
Vinclozolin	65.7	7.2	100.0	.	.	.	.	85.8	14.2	14.2	85.8
Unknown or Other Fungicide	60.6	6.7	100.0	.	.	.	.	96.5	3.5	1.5	98.5
Total	172.2	18.9	100.0	.	.	.	.	89.0	11.0	9.7	90.3
Desiccant											
Glyphosate	24.3	2.7	100.0	.	.	.	.	96.7	3.3	3.3	96.7
Unknown or Other Desiccant	5.8	0.6	100.0	.	.	.	.	100.0	.	.	100.0
Total	30.1	3.3	100.0	.	.	.	.	97.3	2.7	2.7	97.3

¹ Pesticides applied as a tank-mixture were considered separately unless a commercial premix was used. . = no data reported.

² Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.

Table 21. GENETICALLY MODIFIED CANOLA: Types and acres grown in North Dakota, 2008.¹

District	Canola Acres	Glyphosate Resistant		Liberty Resistant		Clearfield Resistant ²	
		Acres Used	%	Acres Used	%	Acres Used	%
	1000	1000	%	1000	%	1000	%
Northwest	223.0	126.1	56.6	95.7	42.9	1.2	0.5
North Central	166.0	100.4	60.5	50.1	30.2	3.9	2.4
Northeast	352.0	172.5	49.0	165.0	46.9	8.5	2.4
West Central	78.0	60.0	76.9	17.1	21.9	.	.
Central	34.5	11.7	34.0	18.7	54.2	3.7	10.8
East Central	4.5	3.2	71.7	1.3	28.3	.	.
Southwest	43.0	33.0	76.8	7.8	18.2	.	.
Combined SC and SE Districts	9.0	.	.	.	.	.	.
State Total	910.0	507.0	55.7	355.6	39.1	17.4	1.9

¹ . = no data reported

² The Clearfield trait was developed using natural selection/traditional plant breeding, and is not genetically modified (GMO).

Table 22. MUSTARD: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2008.¹

	Acres treated ²	Acres treated	Applications					Operator/ Applicator		Method of Application	
			1x	2x	3x	4x	5x	Farm	Custom	Aerial	Ground
	1000	%	%	%	%	%	%	%	%	%	
Herbicide											
Unknown or Other Herbicide	15.2	40.8	100.0	.	.	.	.	99.3	0.7	.	100.0
Total	15.2	40.8	100.0	.	.	.	.	99.3	0.7	.	100.0

¹ Pesticides applied as a tank-mixture were considered separately unless a commercial premix was used. . = no data reported.

² Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.

Table 23. SUGARBEET: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2008.¹

	Acres treated ² 1000	Acres treated %	Applications					Operator/ Applicator		Method of Application	
			1x %	2x %	3x %	4x %	5x %	Farm %	Custom %	Aerial %	Ground %
Herbicide											
Clethodim	63.0	30.3	19.0	8.5	70.5	2.0	.	94.0	6.0	6.0	94.0
Clopyralid	99.4	47.8	29.8	5.3	39.1	.	25.7	70.4	29.6	29.6	70.4
Desmedipham	10.1	4.9	59.1	6.7	34.2	.	.	100.0	.	.	100.0
Desmedipham + Phenmedipham	85.6	41.2	15.9	27.4	55.2	1.5	.	95.6	4.4	4.4	95.6
Desmedipham + Phenmedipham +Ethofumesate	86.9	41.8	27.8	17.5	20.6	4.7	29.4	63.9	36.1	36.1	63.9
Ethofumesate	27.7	13.3	17.7	27.5	35.4	20	.	100.0	.	.	100.0
Glyphosate	253.6	121.9	26.8	48.8	24.4	.	.	95.3	4.7	1.5	98.5
Triflurosulfuron	142.4	68.5	21.0	14.9	42.3	3.8	18.0	76.1	23.9	23.9	76.1
Unknown or Other Herbicide	31.2	15.0	34.9	11.9	45.6	7.6	.	87.8	12.2	12.2	87.8
Total	800.0	384.6	24.9	25.8	37.3	2.5	9.6	85.2	14.8	13.7	86.3
Insecticide											
Chlorpyrifos	59.7	28.7	100.0	.	.	.	.	100.0	.	.	100.0
Terbufos	59.2	28.5	100.0	.	.	.	.	100.0	.	.	100.0
Unknown or Other Insecticide	0.2	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Total	119.2	57.3	100.0	.	.	.	.	100.0	.	.	100.0
Fungicide											
Prothioconazole	9.5	4.6	100.0	.	.	.	.	26.8	73.2	73.2	26.8
Pyraclostrobin	197.0	94.7	53.9	42.9	3.3	.	.	82.5	17.5	17.5	82.5
Tetraconazole	48.5	23.3	100.0	.	.	.	.	74.0	26.0	20.8	79.2
Triphenyltin Hydroxide	66.2	31.8	91.3	.	8.7	.	.	91.6	8.4	8.4	91.6
Unknown or Other Fungicide	41.9	20.2	63.4	24.4	12.2	.	.	75.6	24.4	27.2	72.8
Total	363.1	174.6	69.2	26.1	4.8	.	.	80.8	19.2	18.9	81.1

¹ Pesticides applied as a tank-mixture were considered separately unless a commercial premix was used. . = no data reported.

² Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.

Table 24. GENETICALLY MODIFIED SUGARBEET: Types and acres grown in North Dakota, 2008.¹

District	Sugarbeet Acres	Glyphosate Resistant	
		Acres Used	%
	1000	1000	%
Northwest	2.1	2.1	100.0
Northeast	127.0	80.0	63.0
West Central	6.2	.	.
East Central	43.5	39.1	89.8
Southeast	29.2	16.0	54.6
Combined NC, C, SW, and SC Districts	0.0	.	.
State Total	208.0	137.1	65.9

¹ . = no data reported.

Table 25. POTATO: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2008.¹

	Acres treated ²	Acres treated	Applications					Operator/ Applicator		Method of Application	
			1x	2x	3x	4x	5x	Farm	Custom	Aerial	Ground
	1000	%	%	%	%	%	%	%	%	%	%
Herbicide											
Unknown or Other Herbicide	43.4	52.9	100.0	.	.	.	.	91.5	8.5	.	100.0
Total	43.4	52.9	100.0	.	.	.	.	91.5	8.5	.	100.0
Insecticide											
Unknown or Other Insecticide	57.8	70.5	99.9	0.1	.	.	.	100.0	.	.	100.0
Total	57.8	70.5	99.9	0.1	.	.	.	100.0	.	.	100.0
Fungicide											
Unknown or Other Fungicide	379.0	462.3	4.8	.	2.6	7.4	85.2	93.9	6.1	6.1	93.9
Total	379.0	462.3	4.8	.	2.6	7.4	85.2	93.9	6.1	6.1	93.9
Desiccant											
Diquat Dibromide	66.0	80.5	31.4	68.6	.	.	.	100.0	.	.	100.0
Unknown or Other Desiccant	21.4	26.1	100.0	.	.	.	.	84.5	15.5	15.5	84.5
Total	87.4	106.6	48.2	51.8	.	.	.	96.2	3.8	3.8	96.2

¹ Pesticides applied as a tank-mixture were considered separately unless a commercial premix was used. . = no data reported.

² Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.

Table 26. ALFALFA: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2008.¹

	Acres treated ²	Acres treated	Applications					Operator/ Applicator		Method of Application	
			1x	2x	3x	4x	5x	Farm	Custom	Aerial	Ground
	1000	%	%	%	%	%	%	%	%	%	%
Herbicide											
2,4-D	0.7	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Glyphosate	2.5	0.2	100.0	.	.	.	.	91.5	8.5	.	100.0
Imazapic	0.3	0.0	53.4	3.8	42.8	.	.	100.0	.	.	100.0
Picloram	1.3	0.1	84.3	1.0	1.5	13	.	100.0	.	.	100.0
Unknown or Other Herbicide	3.7	0.2	96.3	.	3.7	.	.	80.3	19.7	.	100.0
Total	8.6	0.5	94.4	0.3	3.4	1.9	.	88.9	11.1	.	100.0
Insecticide											
Lambda-cyhalothrin	3.3	0.2	100.0	.	.	.	.	.	100.0	35.4	64.6
Unknown or Other Insecticide	3.8	0.2	100.0	.	.	.	.	5.6	94.4	13.4	86.6
Total	7.1	0.4	100.0	.	.	.	.	3.0	97.0	23.7	76.3

¹ Pesticides applied as a tank-mixture were considered separately unless a commercial premix was used. . = no data reported.

² Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.

Table 27. OTHER HAY: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2008.¹

Herbicide	Acres	Acres	Applications					Operator/ Applicator		Method of Application	
	treated ² 1000	treated %	1x %	2x %	3x %	4x %	5x %	Farm %	Custom %	Aerial %	Ground %
2,4-D	14.1	0.9	97.9	2.1	.	.	.	83.5	16.5	15.7	84.3
Dicamba	1.5	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Glyphosate	10.6	0.7	100.0	.	.	.	.	43.3	56.7	.	100.0
Imazapic	1.1	0.1	92.7	7.3	.	.	.	100.0	.	.	100.0
Picloram	7.2	0.5	94.7	5.3	.	.	.	60.9	39.1	17.4	82.6
Unknown or Other Herbicide	11.6	0.7	92.8	7.2	.	.	.	86.4	13.6	.	100.0
Total	46.1	3.0	96.5	3.5	.	.	.	72.4	27.6	7.5	92.5

¹ Pesticides applied as a tank-mixture were considered separately unless a commercial premix was used. . = no data reported.

² Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.

Table 28. CRP: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2008.¹

Herbicide	Acres	Acres	Applications					Operator/ Applicator		Method of Application	
	treated ² 1000	treated %	1x %	2x %	3x %	4x %	5x %	Farm %	Custom %	Aerial %	Ground %
2,4-D	184.3	6.1	96.7	3.3	.	.	.	67.7	32.3	15.2	84.8
Aminopyralid	36.7	1.2	100.0	.	.	.	.	73.8	26.2	.	100.0
Aminopyralid + 2,4-D	7.4	0.2	100.0	.	.	.	.	56.8	43.2	31.9	68.1
Clopyralid + 2,4-D	46.9	1.6	99.4	0.0	0.6	.	.	65.7	34.3	35.2	64.8
Clopyralid + Fluroxypyr	9.1	0.3	100.0	.	.	.	.	64.7	35.3	.	100.0
Dicamba	32.1	1.1	99.9	0.1	.	.	.	73.4	26.6	24.9	75.1
Dicamba + 2,4-D	11.6	0.4	78.1	21.9	.	.	.	100.0	.	.	100.0
Glyphosate	19.3	0.6	99.8	0.2	.	.	.	88.0	12.0	12.0	88.0
Imazapic	4.4	0.1	100.0	.	.	.	.	30.7	69.3	45.4	54.6
MCPA	8.9	0.3	100.0	.	.	.	.	84.6	15.4	15.4	84.6
Metsulfuron-methyl	7.2	0.2	100.0	.	.	.	.	.	100.0	83.5	16.5
Picloram	61.0	2.0	98.5	0.3	.	.	1.2	79.0	21.0	5.5	94.5
Picloram + 2,4-D	1.0	0.0	100.0	.	.	.	.	20.7	79.3	.	100.0
Unknown or Other Herbicide	56.0	1.9	98.5	1.5	.	.	.	64.2	35.8	6.5	93.5
Total	485.9	16.1	97.8	2.0	0.1	.	0.1	69.6	30.4	15.2	84.8
Insecticide											
Unknown or Other Insecticide	0.1	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Total	0.1	0.0	100.0	.	.	.	.	100.0	.	.	100.0

¹ Pesticides applied as a tank-mixture were considered separately unless a commercial premix was used. . = no data reported

² Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.

Table 29. PASTURE: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2008.¹

	Acres treated ²	Acres treated	Applications					Operator/ Applicator		Method of application	
			1x	2x	3x	4x	5x	Farm	Custom	Aerial	Ground
	1000	%	%	%	%	%	%	%	%	%	%
Herbicide											
2,4-D	101.2	1.0	94.3	5.6	0.1	.	.	74.1	25.9	12.3	87.7
Aminopyralid	41.8	0.4	99.6	0.4	.	.	.	25.7	74.3	12.2	87.8
Clopyralid + 2,4-D	2.3	0.0	100.0	.	.	.	.	72.9	27.1	.	100.0
Clopyralid + Fluroxypyr	2.4	0.0	96.5	3.5	.	.	.	96.5	3.5	.	100.0
Clopyralid + MCPA	1.0	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Dicamba	8.0	0.1	100.0	.	.	.	.	88.3	11.7	.	100.0
Dicamba + 2,4-D	5.5	0.1	84.3	15.7	.	.	.	79.8	20.2	.	100.0
Diflufenzopyr-sodium + Dicamba	1.4	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Glyphosate	1.2	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Imazapic	7.8	0.1	84.7	15.3	.	.	.	50.5	49.5	30.7	69.3
MCPA	1.1	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Picloram	61.2	0.6	90.5	3.8	5.7	.	.	90.6	9.4	5.3	94.7
Picloram + 2,4-D	20.0	0.2	100.0	.	.	.	.	100.0	.	.	100.0
Unknown or Other Herbicide	18.7	0.2	95.3	4.7	.	.	.	67.9	32.1	15.4	84.6
Total	273.5	2.6	94.6	4.1	1.3	.	.	72.4	27.6	9.5	90.5
Insecticide											
Unknown or Other Insecticide	4.5	0.0	100.0	.	.	.	.	88.8	11.2	11.2	88.8
Total	4.5	0.0	100.0	.	.	.	.	88.8	11.2	11.2	88.8
Fungicide											
Unknown or Other Fungicide	0.5	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Total	0.5	0.0	100.0	.	.	.	.	100.0	.	.	100.0

¹ Pesticides applied as a tank-mixture were considered separately unless a commercial premix was used. . = no data reported.

² Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.

Table 30. FALLOW: Herbicide, Insecticide, and Fungicide usage and application method, North Dakota, 2008.¹

	Acres treated ²	Acres treated	Applications					Operator/ Applicator		Method of Application	
			1x	2x	3x	4x	5x	Farm	Custom	Aerial	Ground
	1000	%	%	%	%	%	%	%	%	%	%
Herbicide											
2,4-D	27.4	3.8	81.8	18.2	.	.	.	42.2	57.8	.	100.0
Clopyralid + 2,4-D	1.8	0.3	100.0	.	.	.	.	100.0	.	.	100.0
Dicamba	71.3	9.9	78.7	15.8	1.6	3.8	.	84.9	15.1	.	100.0
Dicamba + 2,4-D	46.5	6.4	45.6	54.4	.	.	.	89.3	10.7	.	100.0
Glyphosate	268.5	37.1	77.5	18.2	4.3	.	.	69.9	30.1	.	100.0
Unknown or Other Herbicide	21.0	2.9	76.2	23.8	.	.	.	76.2	23.8	.	100.0
Total	436.5	60.4	74.6	21.8	2.9	0.6	.	73.1	26.9	.	100.0

¹ Pesticides applied as a tank-mixture were considered separately unless a commercial premix was used. . = no data reported.

² Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.

Table 31. HERBICIDE usage in North Dakota, 2008.¹

Herbicide	Acres treated ² 1000	Acres treated %	Applications					Operator/ Applicator		Method of Application	
			1x %	2x %	3x %	4x %	5x %	Farm %	Custom %	Aerial %	Ground %
2,4-D	1861.5	4.8	96.7	1.0	2.3	.	.	90.2	9.8	2.7	97.3
2,4-D-beester	16.9	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Acetochlor	68.3	0.2	100.0	.	.	.	.	53.7	46.3	1.9	98.1
Acetochlor + Atrazine	17.3	0.0	100.0	.	.	.	.	67.7	32.3	.	100.0
Acetochlor + Dichlormid + Atrazine	57.9	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Alachlor	9.3	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Aminopyralid	79.7	0.2	99.8	0.2	.	.	.	49.0	51.0	6.4	93.6
Aminopyralid + 2,4-D	9.6	0.0	100.0	.	.	.	.	43.9	56.1	44.7	55.3
Atrazine	59.5	0.2	100.0	.	.	.	.	66.7	33.3	.	100.0
Atrazine + Glufosinate-ammonium	16.8	0.0	100.0	.	.	.	.	58.0	42.0	.	100.0
Bentazon	779.2	2.0	67.3	32.7	.	.	.	91.1	8.9	.	100.0
Bentazon + Sethoxydim	77.3	0.2	62.7	37.3	.	.	.	92.4	7.6	10.9	89.1
Bromoxynil + Pyrasulfotole + Mefenpyr	834.4	2.1	100.0	.	.	.	.	87.4	12.6	0.7	99.3
Bromoxynil	50.0	0.1	94.8	5.2	.	.	.	88.1	11.9	16.6	83.4
Bromoxynil + 2,4-D	88.0	0.2	100.0	.	.	.	.	90.7	9.3	0.6	99.4
Bromoxynil + Fluroxypyr	14.3	0.0	100.0	.	.	.	.	41.4	58.6	.	100.0
Bromoxynil + MCPA	2501.0	6.4	99.9	0.1	.	.	.	86.7	13.3	3.9	96.1
Carfentrazone-ethyl	65.0	0.2	100.0	.	.	.	.	75.0	25.0	.	100.0
Clethodim	937.4	2.4	90.2	4.9	4.7	0.1	.	87.2	12.8	3.3	96.7
Clodinafop-propargyl	902.4	2.3	100.0	.	.	.	.	95.6	4.4	5.2	94.8
Clopyralid	111.6	0.3	37.5	4.7	34.9	.	22.9	69.4	30.6	26.3	73.7
Clopyralid + 2,4-D	70.9	0.2	99.4	0.0	0.6	.	.	68.7	31.3	33.6	66.4
Clopyralid + Fluroxypyr	3742.4	9.6	99.7	0.3	.	.	.	91.6	8.4	1.2	98.8
Clopyralid + MCPA	12.3	0.0	100.0	.	.	.	.	73.8	26.2	.	100.0
Cloransulam-methyl	19.9	0.1	100.0	.	.	.	.	50.0	50.0	.	100.0
Desmedipham	10.1	0.0	59.1	6.7	34.2	.	.	100.0	.	.	100.0
Desmedipham + Phenmedipham	85.6	0.2	15.9	27.4	55.2	1.5	.	95.6	4.4	4.4	95.6
Desmedipham + Phenmedipham + Ethofumesate	86.9	0.2	27.8	17.5	20.6	4.7	29.4	63.9	36.1	36.1	63.9
Dicamba	591.6	1.5	91.3	8.0	0.2	0.5	.	90.6	9.4	2.0	98.0
Dicamba + 2,4-D	99.0	0.3	71.0	29.0	.	.	.	93.8	6.2	.	100.0
Dicamba + Nicosulfuron	7.0	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Diflufenzopyr-sodium + Dicamba	279.6	0.7	64.9	2.4	.	33	.	89.5	10.5	.	100.0
Dimethenamid-P	145.4	0.4	64.0	36.0	.	.	.	88.8	11.2	.	100.0
Ethalfuralin	166.8	0.4	100.0	.	.	.	.	78.6	21.4	7.9	92.1
Ethofumesate	27.7	0.1	17.7	27.5	35.4	19	.	100.0	.	.	100.0
Fenoxaprop + Pyrasulfotole + Bromoxynil + Mefenpyr	49.8	0.1	100.0	.	.	.	.	90.0	10.0	1.6	98.4
Fenoxaprop + Bromoxynil + MCPA	49.8	0.1	100.0	.	.	.	.	90.9	10.0	1.6	98.4
Fenoxaprop-P	6.4	.	100.0	.	.	.	.	100.0	.	.	100.0
Flucarbazone sodium	3461.4	8.9	98.2	1.2	0.6	.	.	86.6	13.4	0.5	99.5
Flumiclorac	970.8	2.5	100.0	.	.	.	.	91.9	8.1	2.2	97.8
Flumioxazin	132.5	0.3	100.0	.	.	.	.	61.9	38.1	7.1	92.9
Fluroxypyr	263.4	0.7	99.2	0.8	.	.	.	95.4	4.6	.	100.0
Fluroxypyr + 2,4-D	45.7	0.7	100.0	.	.	.	.	37.6	62.4	.	100.0
Fluroxypyr + MCPA	87.8	0.2	100.0	.	.	.	.	69.3	30.7	0.1	99.9
Fomesafen	145.7	0.4	70.2	29.8	.	.	.	77.1	22.9	.	100.0
Foramsulfuron	14.8	0.0	100.0	.	.	.	.	64.3	35.7	.	100.0
Glufosinate-ammonium	389.9	1.0	92.8	7.2	.	.	.	89.1	10.9	1.8	98.2
Glyphosate	12042.7	31.0	40.2	55.9	3.9	0.0	.	85.4	14.6	1.9	98.1
Glyphosate + 2,4-D	10.9	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Glyphosate + Dicamba	10.5	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Glyphosate + Sulfentrazone	25.3	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Halosulfuron	12.3	0.0	100.0	.	.	.	.	76.7	23.3	3.6	96.4
Imazamethabenz	85.5	0.2	97.1	2.9	.	.	.	86.3	13.7	.	100.0
Imazamox	786.7	2.0	82.9	17.1	.	.	.	88.6	11.4	3.2	96.8

Table 31. HERBICIDE usage in North Dakota, 2008.¹ (Continued)

Herbicide	Acres treated ² 1000	Acres treated %	Applications					Operator/ Applicator		Method of Application	
			1x %	2x %	3x %	4x %	5x %	Farm %	Custom %	Aerial %	Ground %
Imazapic	13.6	0.0	89.6	9.4	1.0	.	.	49.1	50.9	32.4	67.6
Imazethapyr	94.8	0.2	72.4	27.6	.	.	.	69.7	30.3	.	100.0
Imazethapyr + Glyphosate	46.3	0.1	100.0	.	.	.	.	92.9	7.1	.	100.0
MCPA	933.6	2.4	99.7	0.3	.	.	.	86.8	13.2	1.8	98.2
MCPP + 2,4-D + Dicamba	1.9	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Mesosulfuron	32.8	0.1	100.0	.	.	.	.	83.2	16.8	.	100.0
Mesosulfuron + Propoxycarbazone	208.7	0.5	100.0	.	.	.	.	82.8	17.2	.	100.0
Mesotrione	24.4	0.1	92.6	7.4	.	.	.	86.4	13.6	.	100.0
Metsulfuron-methyl	29.8	0.1	100.0	.	.	.	.	70.4	29.6	20.2	79.8
Metsulfuron-methyl + Dicamba + 2,4-D	2.1	0.0	100.0	.	.	.	.	30.6	69.4	.	100.0
Nicosulfuron	12.4	0.0	100.0	.	.	.	.	80.0	20.0	.	100.0
Nicosulfuron + Rimsulfuron	19.1	0.0	93.3	6.7	.	.	.	78.3	21.7	.	100.0
Paraquat	3.4	0.0	100.0	.	.	.	.	49.3	50.7	21.7	78.3
Pendimethalin	191.1	0.5	100.0	.	.	.	.	85.4	14.6	0.3	99.7
Pendimethalin + Imazethapyr	11.5	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Picloram	137.7	0.4	94.7	2.1	2.6	0.1	0.5	83.7	16.3	5.7	94.3
Picloram + 2,4-D	21.0	0.1	100.0	.	.	.	.	96.2	3.8	.	100.0
Pinoxaden	1400.6	3.6	99.6	.	0.4	.	.	90.2	9.8	2.3	97.7
Quizalofop-P-ethyl	376.8	1.0	90.2	8.6	1.2	.	.	89.1	10.9	1.5	98.5
S-Metolachlor + Atrazine + Mesotrione	21.8	0.1	100.0	.	.	.	.	85.8	14.2	.	100.0
Sethoxydim	379.5	1.0	76.4	23.6	.	.	.	89.9	10.1	.	100.0
Sulfentrazone	545.8	1.4	100.0	.	.	.	.	83.1	16.9	0.2	99.8
Tembotrione	28.3	0.1	100.0	.	.	.	.	65.8	34.2	.	100.0
Thifensulfuron methyl	141.4	0.4	100.0	.	.	.	.	95.0	5.0	.	100.0
Thifensulfuron methyl + Tribenuron-methyl	1729.1	4.4	100.0	.	.	.	.	89.5	10.5	1.2	98.8
Topramazone	7.3	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Tralkoxydim	21.4	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Triallate + Trifluralin	10.1	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Tribenuron-methyl	164.5	0.4	97.0	3.0	.	.	.	87.8	12.2	1.9	98.1
Trifluralin	74.0	0.2	100.0	.	.	.	.	70.1	29.9	.	100.0
Triflurosulfuron	142.4	0.4	21.0	14.9	42.3	3.8	18.0	76.1	23.9	23.9	76.1
Unknown or Other Herbicide	1859.4	4.8	90.6	7.5	1.8	0.1	.	72.2	27.8	5.4	94.6
Total	41139.1	105.7	78.5	19.1	1.9	0.3	0.2	86.5	13.5	2.4	97.6

¹ Pesticides applied as a tank-mixture were considered separately unless a commercial premix was used. . = no data reported.

² Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.

Table 32. DESICCANT usage in North Dakota, 2008.¹

Desiccant	Acres treated ² 1000	Acres treated %	Applications					Operator/ Applicator		Method of Application	
			1x %	2x %	3x %	4x %	5x %	Farm %	Custom %	Aerial %	Ground %
Diquat Dibromide	66.0	0.2	31.4	68.6	.	.	.	100.0	.	.	100.0
Flumioxazin	63.5	0.2	100.0	.	.	.	.	70.1	29.9	29.0	71.0
Glyphosate	875.3	2.2	100.0	0.0	.	.	.	74.7	25.3	12.7	87.3
Paraquat	226.0	0.5	96.9	.	3.1	.	.	56.1	43.9	13.7	86.3
Unknown or Other Desiccant	225.6	0.6	100.0	.	.	.	.	58.2	41.8	27.3	72.7
Total	1433.8	3.7	96.4	3.2	0.4	.	.	70.4	29.6	15.3	84.7

¹ Pesticides applied as a tank-mixture were considered separately unless a commercial premix was used. . = no data reported.

² Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.

Table 33. INSECTICIDE usage in North Dakota, 2008.¹

	Acres treated ² 1000	Acres treated %	Applications					Operator/ Applicator		Method of Application	
			1x %	2x %	3x %	4x %	5x %	Farm %	Custom %	Aerial %	Ground %
Insecticide											
Bifenthrin	19.2	0.0	100.0	.	.	.	.	46.7	53.3	53.3	46.7
Bifenthrin + Zeta-Cypermethrin	30.3	0.1	100.0	.	.	.	.	82.7	17.3	.	100.0
Carbaryl	3.3	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Chlorpyrifos	1394.8	3.6	91.1	8.9	.	.	.	59.1	40.9	27.2	72.8
Chlorpyrifos + Gamma-cyhalothrin	82.1	0.2	85.4	14.6	.	.	.	70.7	29.3	15.3	84.7
Cyfluthrin	202.0	0.5	88.6	11.4	.	.	.	66.3	33.7	2.6	97.4
Deltamethrin	165.4	0.4	97.0	3.0	.	.	.	39.5	60.5	38.2	61.8
Dimethoate	5.8	0.0	100.0	.	.	.	.	65.0	35.0	.	100.0
Esfenvalerate	773.0	2.0	94.9	5.1	.	.	.	52.0	48.0	38.4	61.6
Gamma-cyhalothrin	61.4	0.2	87.9	12.1	.	.	.	68.8	31.2	6.5	93.5
Lambda-cyhalothrin	845.7	2.2	92.1	7.9	.	.	.	63.2	36.8	21.1	78.9
Malathion	9.1	0.0	93.0	7.0	.	.	.	56.6	43.4	43.4	56.6
Methyl Parathion	70.4	0.2	100.0	.	.	.	.	55.5	44.5	40.9	59.1
Terbufos	80.3	0.2	100.0	.	.	.	.	100.0	.	.	100.0
Zeta-cypermethrin	19.8	0.1	100.0	.	.	.	.	86.4	13.6	13.6	86.4
Unknown or Other Insecticide	768.4	2.0	92.3	7.7	.	.	.	63.4	36.6	23.6	76.4
Total	4531.0	11.6	92.6	7.4	.	.	.	60.3	39.7	25.7	74.3

¹ Pesticides applied as a tank-mixture were considered separately unless a commercial premix was used. . = no data reported.

² Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.

Table 34. FUNGICIDE usage in North Dakota, 2008.¹

	Acres treated ² 1000	Acres treated %	Applications					Operator/ Applicator		Method of Application	
			1x %	2x %	3x %	4x %	5x %	Farm %	Custom %	Aerial %	Ground %
Fungicide											
Azoxystrobin	3.9	0.0	28.4	71.6	.	.	.	28.4	71.6	.	100.0
Copper	14.8	0.0	65.4	.	34.6	.	.	100.0	.	.	100.0
Mancozeb	323.5	0.8	0.2	.	.	.	99.8	100.0	.	.	100.0
Mineral Oil	9.2	0.0	100.0	.	.	.	.	69.2	30.8	.	100.0
Propiconazole	1457.8	3.7	99.0	1.0	.	.	.	87.8	12.2	3.6	96.4
Propiconazole + Azoxystrobin	77.4	0.2	100.0	.	.	.	.	92.8	7.2	.	100.0
Propiconazole + Chlorothalonil	11.1	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Propiconazole + Trifloxystrobin	288.4	0.7	91.5	3.1	.	5.4	.	86.0	14.0	1.2	98.8
Prothioconazole	651.3	1.7	83.7	15.4	1.0	.	.	72.8	27.2	22.1	77.9
Prothioconazole + Tebuconazole	10.9	0.0	100.0	.	.	.	.	44.0	56.0	.	100.0
Pyraclostrobin	2145.9	5.5	91.8	7.8	0.4	.	.	79.2	20.8	12.9	87.1
Tebuconazole	1146.0	2.9	93.2	6.8	.	.	.	70.6	29.4	23.0	77.0
Tetraconazole	48.5	0.1	100.0	.	.	.	.	74.0	26.0	20.8	79.2
Thiophanate	59.8	0.2	100.0	.	.	.	.	72.4	27.6	24.5	75.5
Triphenyltin Hydroxide	74.6	0.2	92.3	.	7.7	.	.	92.5	7.5	7.5	92.5
Vinclozolin	65.7	0.2	100.0	.	.	.	.	85.8	14.2	16.2	85.8
Unknown or Other Fungicide	953.5	2.5	92.3	3.2	1.7	2.8	.	73.0	27.0	11.0	89.0
Total	7342.3	18.9	88.9	5.5	0.6	0.6	4.4	79.6	20.4	12.0	88.0

¹ Pesticides applied as a tank-mixture were considered separately unless a commercial premix was used. . = no data reported.

² Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.

Table 35. Percent of respondents answering “Yes” to pest management decisions and practices in North Dakota, 2008.

Do you:	Northwest	North Central	Northeast	West Central	Central	East Central	Southwest	South Central	Southeast	State Totals
	----- % -----									
Scout field regularly for pests?	66.6	71.6	67.3	62.1	67.3	68.9	65.5	61.7	67.7	66.6
Make routine treatments for pests experienced the previous year?	37.2	44.2	38.4	31.1	38.0	42.8	35.9	35.7	37.5	38.0
Make treatments based on identity, density or population size?	60.4	63.8	56.6	50.0	60.5	66.6	60.0	51.2	60.0	58.8
Use university recommendations in making treatment decisions?	45.0	49.2	45.4	40.4	46.2	52.5	45.2	34.4	40.6	44.3
Use tilling, chopping, mowing, burning of field edges, lanes, ditches, roadways or fence lines to manage pests in your fields?	35.6	42.2	55.2	35.7	49.7	51.0	30.7	40.2	46.5	43.4
Consider pest resistance when selecting varieties?	44.8	47.2	44.0	34.5	47.7	51.6	40.3	37.3	46.5	43.9
Alternate pesticides to delay pest resistance?	43.9	45.2	46.0	36.3	44.7	52.5	38.8	35.7	45.8	43.4
Rotate crops to manage pests?	52.6	49.0	46.0	42.2	48.8	57.8	35.7	41.5	50.8	47.4
Use disease, insect or seed forecasting information available on the Internet or via toll-free phone lines?	19.2	22.6	21.7	14.6	18.1	29.0	14.8	12.9	20.3	19.4
Use Internet for pest management decisions?	24.5	26.9	24.1	19.3	23.7	29.0	22.3	17.6	22.3	23.4
Employ a crop consultant to help manage pests?	28.7	26.1	26.4	23.6	26.3	37.0	28.1	24.7	26.6	27.4
Increase acres of genetically modified crops for pest management?	4.7	7.0	9.4	2.5	11.1	10.9	4.3	5.0	9.7	7.3
Decrease acres of genetically modified crops for pest management?	2.4	2.0	3.7	2.5	2.3	4.1	1.2	0.8	4.3	2.6



United States Department of Agriculture
National Agricultural Statistics Service
North Dakota Field Office



2008 PESTICIDE USE AND PEST MANAGEMENT PRACTICES STUDY

January 16, 2009

Dear North Dakota Farm Operator:

Managing pest problems in agriculture is a challenge you face every growing season. Your background in handling these demands is unique. When it comes to pesticides in agriculture, much of the controversy over their usage is fueled by misinformation. It is vitally important that current, accurate pesticide usage information is available to demonstrate that producers are good stewards of the land. This study will provide a profile of pesticide use and pest management practices at state and district levels for North Dakota.

This study is a joint undertaking of the North Dakota State University Extension Service, North Dakota Department of Agriculture, and USDA's National Agricultural Statistics Service, North Dakota Field Office. Through this cooperative effort, we are able to provide reliable results in a very efficient manner.

The study will be conducted as a telephone interview. Interviews will begin in late January and continue through March. Information that will be requested includes crop acres, use of seed treatments, acres and crops treated with specific pesticides, use of genetically modified crops, and information about pest management practices and decisions.

Regarding the interview, confidentiality is assured and response will be voluntary. Since you are only part of a small group selected from across the state, we hope you understand the importance and value of this information and will be willing to participate when contacted. The results of the survey will be available by fall 2009 through NDSU and your local extension agent.

Thank you in advance for your time and cooperation.

Sincerely,

Duane Hauck, Director
North Dakota State University
Extension Service

Darin Jantzi, Director
USDA/NASS
North Dakota Field Office

NORTH DAKOTA PESTICIDE USE SURVEY INSTRUMENT FOR 2008 CROPPING YEAR



**NATIONAL
AGRICULTURAL
STATISTICS
SERVICE**

North Dakota Field Office
P.O. Box 3166
Fargo, ND 58108-3166
701-239-5306
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Please make corrections in name, address and zip code, if necessary.

I. ACREAGE AND TREATMENTS BY CROP

REPORT FOR THE FARM YOU OPERATE <i>(Include Land Owned and Rented From Others, Exclude Land Rented Out)</i>							
2008 Crop	Total Acres Planted	Acres Planted with Treated Seed <i>(Exclude Inoculants)</i>		Number of Acres Treated for Each of the Following: <i>(Include 2007 applications for 2008 Crop)</i>			
		Total	With on Farm Treated Seed	Weed Control <i>(Herbicides)</i>	Insect Control <i>(Insecticides) (Exclude seed treatment)</i>	Disease Control <i>(Fungicides) (Exclude seed treatment)</i>	Desiccants <i>(Vine killers, etc.)</i>
WHEAT <i>(Durum, Other Spring, Winter)</i>	1001	1002	1003	1004	1005	1006	1007
BARLEY	1011	1012	1013	1014	1015	1016	1017
OATS	1021	1022	1023	1024	1025	1026	1027
FLAX	1031	1032	1033	1034	1035	1036	1037
CORN	1041	1042	1043	1044	1045	1046	1047
SUNFLOWER	1051	1052	1053	1054	1055	1056	1057
SOYBEANS	1061	1062	1063	1064	1065	1066	1067
FIELD PEAS	1071	1072	1073	1074	1075	1076	1077
LENTILS	1081	1082	1083	1084	1085	1086	1087
POTATOES	1091	1092	1093	1094	1095	1096	1097
SUGARBEETS	1101	1102	1103	1104	1105	1106	1107
DRY EDIBLE BEANS	1111	1112	1113	1114	1115	1116	1117
CANOLA	1121	1122	1123	1124	1125	1126	1127
CRAMBE	1131	1132	1133	1134	1135	1136	1137
SAFFLOWER	1141	1142	1143	1144	1145	1146	1147
MUSTARD, DRY	1151	1152	1153	1154	1155	1156	1157
ALFALFA HAY	1161	1162	1163	1164	1165	1166	1167
OTHER HAY	1171	1172	1173	1174	1175	1176	1177
CRP	1301	1302	1303	1304	1305	1306	1307
FALLOW AND SET ASIDE ACREAGE	1311	1312	1313	1314	1315	1316	1317
PASTURE AND RANGE	1321	1322	1323	1324	1325	1326	1327
TOTAL ACRES OPERATED IN 2008	1501						

II. FARM TREATED SEED - for 2008 crop (Please report for seed that was treated on your farm and used on your operation, except where noted and excluding inoculants. Include on-farm custom and self applied treatment.)

PRODUCT USED TO TREAT (Refer to enclosed list)	Office Use	Acres Seeded With this Seed	Method 1 = Drill box 2 = Auger 3 = Other	PRODUCT USED TO TREAT (Refer to enclosed list)	Office Use	Acres Seeded With this Seed	Method 1 = Drill box 2 = Auger 3 = Other
WHEAT SEED (All)				CANOLA SEED (include commercial seed treatments for this crop)			
	2001	2002	2003		2401	2402	2403
	2011	2012	2013		2411	2412	2413
	2021	2022	2023		2421	2422	2423
	2031	2032	2033	SOYBEAN SEED			
	2041	2042	2043		2501	2502	2503
BARLEY SEED					2511	2512	2513
	2101	2102	2103	POTATO SEED			
	2111	2112	2113		2601	2602	2603
	2121	2122	2123		2611	2612	2613
OAT SEED					2621	2622	2623
	2201	2202	2203	FIELD PEA SEED			
	2211	2212	2213		2701	2702	2703
FLAX SEED					2711	2712	2713
	2301	2302	2303	OTHER SEED			
	2311	2312	2313		2801	2802	2803
	2321	2322	2323		2811	2812	2813

III. USAGE OF INDIVIDUAL PESTICIDES ON 2008 CROPS - Include applications after September 1, 2007 on crops for 2008 harvest. (Please report below the acres treated with each individual chemical during 2008 by crop and/or land use. If pesticides were applied in combination, report each separately. **Exclude seed treatment and inoculants.**)

NAME OF PESTICIDE USED (Please list chemicals used. Refer to the enclosed list)	Office Use	Acres Treated	No. of Applications	Applicator		Method	NAME OF PESTICIDE USED (Please list chemicals used. Refer to the enclosed list)	Office Use	Acres Treated	No. of Applications	Applicator		Method
				1=Self 2=Custom	1=Aerial 2=Ground						1=Self 2=Custom	1=Aerial 2=Ground	
WHEAT (Durum, Other Spring, Winter)							BARLEY						
	3001	3002	3003	3004	3005		3101	3102	3103	3104	3105		
	3011	3012	3013	3014	3015		3111	3112	3113	3114	3115		
	3021	3022	3023	3024	3025		3121	3122	3123	3124	3125		
	3031	3032	3033	3034	3035		3131	3132	3133	3134	3135		
	3041	3042	3043	3044	3045		3141	3142	3143	3144	3145		
	3051	3052	3053	3054	3055		3151	3152	3153	3154	3155		
OATS							FLAX						
	3201	3202	3203	3204	3205		3301	3302	3303	3304	3305		
	3211	3212	3213	3214	3215		3311	3312	3313	3314	3315		
	3221	3222	3223	3224	3225		3321	3322	3323	3324	3325		
CORN							SOYBEANS						
	3401	3402	3403	3404	3405		3501	3502	3503	3504	3505		
	3411	3412	3413	3414	3415		3511	3512	3513	3514	3515		
	3421	3422	3423	3424	3425		3521	3522	3523	3524	3525		
	3431	3432	3433	3434	3435		3531	3532	3533	3534	3535		
SUNFLOWER							DRY EDIBLE BEANS						
	3601	3602	3603	3604	3605		3701	3702	3703	3704	3705		
	3611	3612	3613	3614	3615		3711	3712	3713	3714	3715		
	3621	3622	3623	3624	3625		3721	3722	3723	3724	3725		

III. USAGE OF INDIVIDUAL PESTICIDES ON 2008 CROPS CONTINUED

NAME OF PESTICIDE USED <i>(Please list chemicals used. Refer to the enclosed list)</i>	Office Use	Acres Treated	No. of Appli-cations	Appli-cator		NAME OF PESTICIDE USED <i>(Please list chemicals used. Refer to the enclosed list)</i>	Office Use	Acres Treated	No. of Appli-cations	Appli-cator		Method
				1=Self 2=Custom	1=Aerial 2=Ground					1=Self 2=Custom	1=Aerial 2=Ground	
POTATOES						SUGARBEETS						
	3801	3802	3803	3804	3805		3901	3902	3903	3904	3905	
	3811	3812	3813	3814	3815		3911	3912	3913	3914	3915	
	3821	3822	3823	3824	3825		3921	3922	3923	3924	3925	
	3831	3832	3833	3834	3835		3931	3932	3933	3934	3935	
	3841	3842	3843	3844	3845		3941	3942	3943	3944	3945	
	3851	3852	3853	3854	3855		3951	3952	3953	3954	3955	
	3861	3862	3863	3864	3865		3961	3962	3963	3964	3965	
CANOLA						CRAMBE						
	4001	4002	4003	4004	4005		4101	4102	4103	4104	4105	
	4011	4012	4013	4014	4015		4111	4112	4113	4114	4115	
	4021	4022	4023	4024	4025		4121	4122	4123	4124	4125	
SAFFLOWER						MUSTARD, DRY						
	4201	4202	4203	4204	4205		4301	4302	4303	4304	4305	
	4211	4212	4213	4214	4215		4311	4312	4313	4314	4315	
	4221	4222	4223	4224	4225		4321	4322	4323	4324	4325	
FIELD PEAS						LENTILS						
	4401	4402	4403	4404	4405		4501	4502	4503	4504	4505	
	4411	4412	4413	4414	4415		4511	4512	4513	4514	4515	
	4421	4422	4423	4424	4425		4521	4522	4523	4524	4525	
ALFALFA HAY						OTHER HAY						
	4601	4602	4603	4604	4605		4701	4702	4703	4704	4705	
	4611	4612	4613	4614	4615		4711	4712	4713	4714	4715	
	4621	4622	4623	4624	4625		4721	4722	4723	4724	4725	
CRP						FALLOW, SET ASIDE ACREAGE						
	4801	4802	4803	4804	4805		4901	4902	4903	4904	4905	
	4811	4812	4813	4814	4815		4911	4912	4913	4914	4915	
	4821	4822	4823	4824	4825		4921	4922	4923	4924	4925	

IV. Genetically modified crops are available in North Dakota for corn, soybeans and canola. Please report the acres you planted of these crops in 2008.

CORN	<i>Bt</i> variety for insect resistance	<i>Bt</i> variety for Corn Rootworm resistance	Glyphosate (Roundup Ready) resistant variety	Liberty resistant variety	Clearfield, non-GM, herbicide resistant variety	Stacked Gene Variety (<i>Bt</i> + Herbicide)
Acres =	6101	6106	6102	6103	6104	6105

SOYBEAN	Glyphosate (Roundup Ready) resistant variety
Acres =	6111

SUGARBEET	Glyphosate (Roundup Ready) resistant variety
Acres =	6141

SUNFLOWER	Clearfield resistant variety	Express resistant variety
Acres =	6151	6152

CANOLA	Glyphosate (Roundup Ready) resistant variety	Liberty resistant variety	Clearfield, non-GM, herbicide resistant variety
Acres =	6131	6132	6133

V. Your pest management decisions and practices

Yes = 1 No = 3

<i>Do you . . .</i>	<i>answer Yes or No for each pest category</i>
• scout fields regularly for pests?	6301
• make routine treatments for pests you experienced the previous year?	6302
• make treatments based on identity, density, or population size?	6303
• use University or Extension treatment guidelines for making pest treatment decisions?	6304
• use tilling, chopping, mowing, burning of field edges, lanes, ditches, roadways or fence lines to manage pests in your fields?	6305
• consider pest resistance when selecting varieties to manage pests?	6306
• alternate pesticides to keep pests from becoming resistant to pesticides?	6307
• rotate crops to manage pests?	6308
• use disease, insect or seed forecasting information available on the Internet or via toll free phone lines?	6309
• use Internet to find information necessary for pest management decisions?	6310
• employ the services of a crop consultant to help manage pests?	6311
• plan to INCREASE acres of genetically modified crops used for pest management?	6312
• plan to DECREASE acres of genetically modified crops used for pest management?	6313

This completes the questionnaire. Thank you for your cooperation.

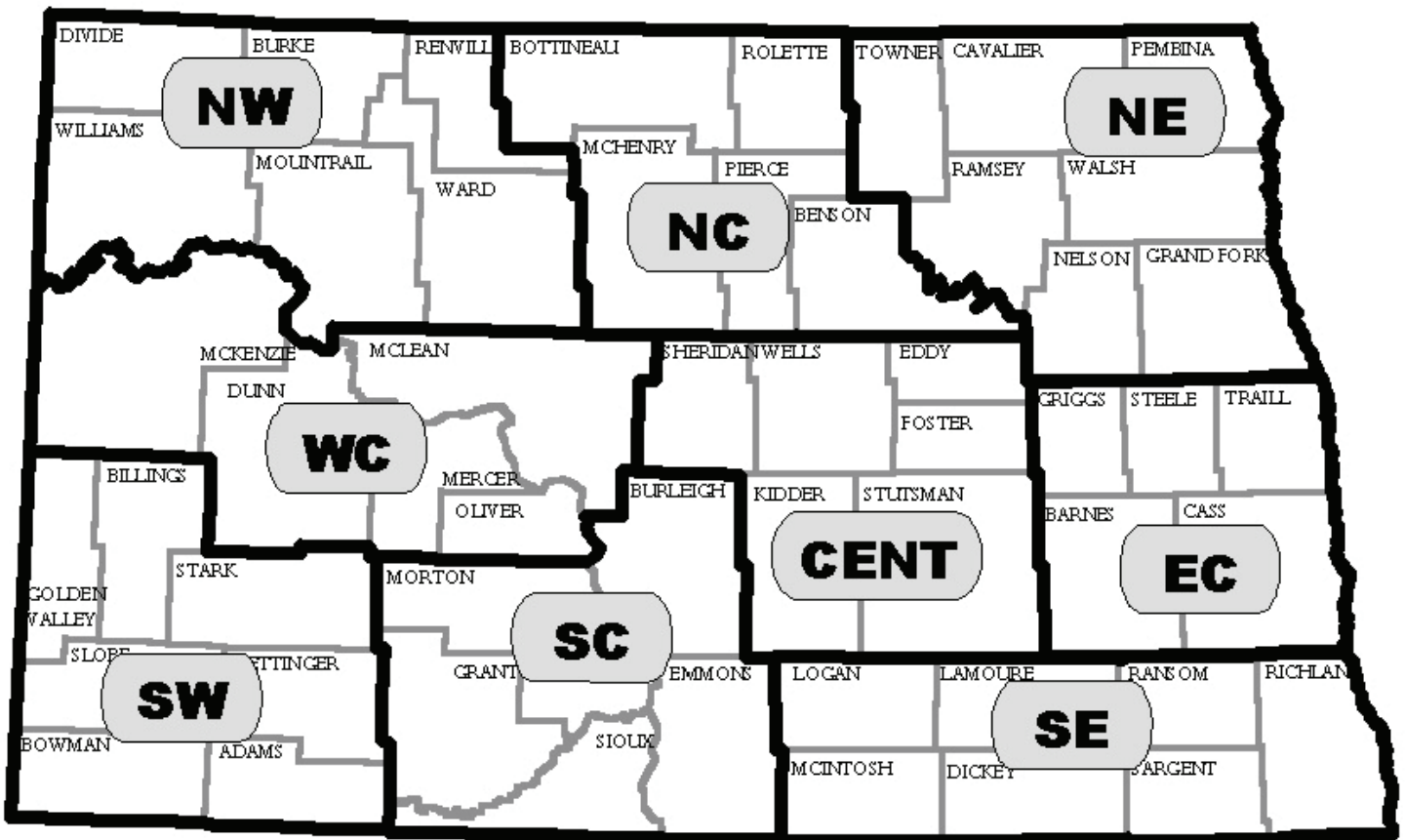
Reported by: _____ Date: _____

Response		Respondent		Mode		Enum.	Eval.
1-Comp 2-R 3-Inac 4-Office Hold	9901	1-Op/Mgr 2-Sp 3-Acct/Bkpr 4-Partner 9-Oth	9902	1-Mail 2-Tel 3-Face-to-Face 4-CATI 19-Other	9903	098	100
S/E Name							

9910	MM	DD	YY
Date:	_____	_____	_____

APPENDIX B.

North Dakota Agricultural Statistics Districts



APPENDIX C

Trade and common names of pesticides

There are many trade names for pesticide active ingredients. Below is only a partial list of product names.

<u>Common name</u>	<u>Product name(s)</u>
2,4-D	2,4-D
2,4-D+Dicamba	KambaMaster, Rifle D
2,4-DB	Butoxone
2,4-DB	Butyrac
Acetochlor	Breakfree, Harness, Surpass, Volley
Acetochlor+Atrazine	Breakfree ATZ Lite, Confidence Extra, Harness Xtra, Keystone LA
Acetochlor+Clopyralid+Flumetsulam	SureStart
Alachlor	Arena, Cropstar, Intro, Lasso, Saddle, Stall
Aminopyralid	Milestone
Aminopyralid+2,4-D	Fore Front R&P
Atrazine	AAtrax
Atrazine+Glufosinate	Liberty ATZ
Atrazine+Metolachlor	Cinch ATZ Lite
Atrazine+S-Metolachlor	Bicep II Magnum, Bicep Lite II Magnum, Cinch ATZ, Lite
Azoxystrobin	Abound, Amistar, Heritage, Quadris
Copper sulfate	Basic Copper
Bentazon	Ascend, Basagran, Depend, Pledge, Rezult B
Bifenthrin	Attain, Bifenthrin, Biflex, Brigade, Capture
Bifenthrin+Zeta-Cypermethrin	Hero
Bromoxynil+2,4-D	Agsco B-4, DoubleUp B+G, Maestro D, Weco Max
Bromoxynil	Bromox, Brox, Bucril, Moxy
Bromoxynil+Fluroxypyr	Starane NXT
Bromoxynil+MCPA	Bison, Bromac, Bromox MCPA, Bronate Advanced, Brox M, Maestro MA, Wildcard Xtra
Carbaryl	Carbaryl, Sevin
Carbofuran	Furadan
Carboxin	Vitavax, Kernel Guard Supreme
Carboxin+Diazinon+Lindane	Germate Plus
Carboxin+Imazalil+Thiabendazole	RTU-Vitavax-Extra
Carboxin+Imazalil+Thiabendazole	Vitavax Extra
Carboxin+Maneb+Lindane	DB Green+Vitavax, Enhance Plus
Carboxin+Thiram	RTU-Vitavax-Thiram, Vitavax 200
Carboxin+Thiram+Lindane	VTL
Carboxin+Thiram+Metalaxyl	Stillette
Carfentrazone+Sulfentrazone	Spartan Charge
Carfentrazone	Aim, Shark
Carfentrazone+2,4-D	Rage D-Tech
Carfentrazone+Halosulfuron	Priority
Chlorimuron	Classic
Chlorothalonil	Applause, Bravo, Chloronil 720, Daconil, Echo, Ensign, Equus, Terranil, Thalonil
Chlorothalonil+Azoxystrobin	Quadris Opti
Chlorothalonil+Mefenoxam	Ridomil Gold/Bravo
Chlorothalonil+Thiophanate	Consyst, Spectro
Chlorpyrifos	Chlorpyrifos, Durban, Govern, Lorsban, Pilot, Reldan
Chlorpyrifos+Gamma-cyhalothrin	Cobalt
Chlorsulfuron+Metsulfuron	Chism, Finesse, Report Extra
Clethodim	Arrow, Clethodim, Intensity, others
Clodinafop	Discover/NG
Clopyralid	Stinger, Clopyr Ag, Garrison, Spur
Clopyralid+Fluroxypyr	Colt, WideMatch
Clopyralid+2,4-D	Curtail, Cutback
Clopyralid+MCPA	Curtail M
Clopyralid+Triclopyr	Redeem
Cloransulam+Sulfentrazone	Authority First, Sonic
Cloransulam	Amplify, FirstRate
Clothianidin	Poncho, Prosper
Copper	Agra-cop, Coppericide, Kocide, Nu-Cop, Nordox, Oxycop, Copper Sulfate
Cyfluthrin	Baythroid, Tempo
Cyfluthrin+Tebupirimphos	Aztec
Cymoxanil	Curzate
Deltamethrin	Battalion, Decis, Delta Gold, Deltagard
Desmedipham	Alphanex, Betanex
Desmedipham+Phenmedipham	Betamix, Phen-Des 8+8
Desmedipham+Phenmedipham+Ethofumesate	BNB Plus, Progress
Dicamba	Banvel, Clarity, Rifle, Sterling Blue, Vision
Dicamba+2,4-D	Brash, Latigo, Outlaw, Weedmaster
Dicamba+Thifensulf+Tribenuron+Metsulf	Agility
Difenoconazole	Dividend, Inspire
Difenoconazole+Mefenoxam	Incentive RTA
Diflufenzopyr+Dicamba	Distinct, Overdrive, Status
Dimethenamid	Establish, Frontier, Outlook, Propel
Dimethipin	Harvade
Dimethoate	Cygon, Cymate, De-Fend, Digon
Diquat	Reglone
Endothall	Des-I-Cate II
Esfenvalerate	Asana
Ethalfuralin	Sonalan
Ethofumesate	Ethotron, Nortron, Progress
Ethyl parathion	Parathion
Etridiazole+Thiophanate	Banrot
Fenoxaprop	Puma
Fenoxaprop+Fluazifop	Fusion
Fenoxaprop+Pyrasulfuron+Bromoxynil	Wolverine
Flucarbazone	Everest, Pre-Pare
Flumiclorac	Resource
Flumioxazin	Valor, Chateau, Encompass, Gangster V
Flumioxazin+Cloransulam	Gangster
Fluroxypyr	Obtain, Starane, Vista
Fluroxypyr+2,4-D	Starane+Saber
Fluroxypyr+2,4-D	Starane+Salvo
Fluroxypyr+MCPA	Starane+Sword
Fluthiacet	Cadet
Fomesafen	Flexstar, Reflex
Foramsulfuron	Option
Gamma-cyhalothrin	Proaxis, Prolex
Glufosinate-ammonium	Finale, Ignite 280, Liberty, Rely
Glyphosate	Glyphosate, Roundup
Glyphosate+Sulfentrazone	Spartan Advance
Halosulfuron+Dicamba	Yukon
Halosulfuron	Permit, Sandea
Imazamethabenz	Assert
Imazamox	Beyond, Raptor
Imazamox+MCPA	ClearMax
Imazapic	Cadre, Plateau

Imazethapyr	Pursuit	Propiconazole+Chlorothalonil	Tilt/Bravo
Imazethapyr+Dicamba	Resolve	Propiconazole+Thiophanate	Tilt Plus
Imazethapyr+Glyphosate	Extreme	Propiconazole+Trifloxystrobin	Stratego
Imazethapyr+Imazapyr	Lightning	Propiconazole+Triphenyltin hydroxide	Orbit/Super Tin
Imazethapyr+Sulfentrazone	Authority Assist	Propoxycarbazone	Olympus
Imidacloprid	Admire, Couraze, Impulse, Marathon, Gaucho	Prothioconazole	Proline
Imidacloprid+Carboxin	Latitude	Prothioconazole+Tebuconazole	Prosaro
Imidacloprid+Metalaxyl	Concur	Pyraclostrobin	Cabrio
Isoxaflutole	Balance	Pyraclostrobin+Tebuconazole	Headline
Isoxaflutole+Thiencarbazone	Corvus	Pyraflufen	ET
Lambda-cyhalothrin	Battle, Karate, Warrior	Pyroxulam	PowerFlex
Lindane	Lindane	Pyroxulam+Florasulam+Fluroxypyr	GoldSky
Malathion	Cythion, Malathion	Quinclorac	Paramount
Mancozeb	Dithane, Manzate, Penncozeb,	Quizalofop-P-ethyl	Assure II, Targa
Mancozeb+Copper sulfate	Cuprofix	Rimsulfuron	Matrix, Resolve
Mancozeb+Copper hydroxide	Junction, Mankocide	Sethoxydim	Poast, Prestige, Result G, Trigger
Mancozeb+Cymoxanil	Curzate, Manex	S-Metolachlor	Brawl, Cinch, Dual Magnum
Mancozeb+Myclobutanil	Clevis	S-Metolachlor+Mesotrione	Camix
Mancozeb+Thiophanate	Zyban	S-Metolachlor+Mesotrione+Atrazine	Lumax
Mancozeb+Zoxamide	Gavel	S-Metolachlor+Metribuzin	Boundary
Maneb	Dithane	Sodium chlorate	Defol
Maneb+Lindane	DB Green	Sulfentrazone	Authority, Blanket, Spartan
Maneb+Thiabendazole	Granox Plus	Sulfentrazone+Metribuzin	Authority MTZ
Maneb+Triphenyltin hydroxide	Pro-Tex, Tin-Man	Tebuconazole	Folicur, Orius
MCPP+2,4-D+Dicamba	Green Light Wipe Out	Tebuconazole+Metalaxyl	Raxil MD
Mefenoxam	Apron, Ridomil	Tebuconazole+Metalaxyl+Imazalil	Raxil MD Extra
Mefenoxam+Chlorothalonil	Flouronil, Ridomil Gold Bravo	Tebufenozide	Confirm
Mefenoxam+Copper hydroxide	Ridomil Gold/Copper	Tefluthrin	Force
Mefenoxam+Mancozeb	Ridomil Gold MZ	Tembotrione	Laudis
Mesosulfuron	Silverado	Terbufos	Counter
Mesosulfuron+Propoxycarbazone	Rimfire	Tetraconazole	Domark, Eminent
Mesotrione	Callisto	Thiamethoxam	Cruiser
Mesotrione+Glyphosate+S-metolachlor	Halex GT	Thiamethoxam+Fludioxonil	Cruiser Maxx
Metalaxyl	Apron	Thiameth.+Mefenoxam+Difenocon	Cruiser Maxx
Metalaxyl+PCNB	Apron-Terraclor	Thiamethoxam+Mefenoxam+Fludioxonil	Cruiser Maxx
Methomyl	Lannate, Nudrin	Thiameth.+Mefenoxam+Fludioxonil+Difenocon.	Helix
Methyl parathion	Pennacap-M	Thiamethoxam+Mefenoxam	Ridomil Gold Platinum
Metolachlor	Me-Too-Lachlor, Parallel, Stalwart	Thifensulfuron+Tribenuron	Affinity BroadSpec, Affinity TankMix, Harmony Extra
Metribuzin	Sencor	Thifensulfuron+Tribenuron+Metsulfuron	Accurate Extra, Ally Extra, Canvas
Metribuzin+Sulfentrazone	Authority MTZ	Thifensulfuron	Harass, Harmony GT, Treaty, Unity
Metsulfuron	Accurate, Ally, Cimarron, Escort, others	Thiophanate	Topsin
Metsulfuron+Dicamba+2,4-D	Cimarron Max	Thiophanate+Mancozeb	Zyban
Mevinphos	Phosdrin	Thiram	Gustafson Yield Shield
Mineral oil	Biocover UL	Thiram+Thiabendazole	Agrosol
Nicosulfuron	Accent, Nic-It, Nico	Topramezone	Impact
Nicosulfuron+Rimsulfuron	Steadfast	Tralkoxydim	Achieve
Nicosulfuron+Thifensulfuron	Stout	Tralomethrin	Scout
Paraquat	Firestorm, Gramoxone, Parazone, others	Triallate+Trifluralin	Buckle
Pendimethalin	Acumen, Pendimax, Prowl	Tribenuron	Express, Nuance, Victory
Pendimethalin+Imazethapyr	Pursuit Plus	Trifloxystrobin	Flint, Gem, Trilex
Permethrin	Pounce	Triflumizole	Procure
Permethrin+Carboxin	Kernel Guard Supreme	Trifluralin	Treflan, Triflurex, Trilin, Trust
Phosmet	Imidan	Triflufenuron	UpBeet
Picloram	Tordon 22K	Triphenyltin hydroxide	Agri Tin, Super Tin
Picloram+2,4-D	Grazon P+D, Gun Slinger	Triticonazole+Thiram	Charter
Pinoxaden	Axial	Vinclozolin	Curalan, Ronilan
Propiconazole	Tilt, PropiMax	Zeta-cypermethrin	Fury, Mustang
Propiconazole+Azoxytrobin	Quilt		

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