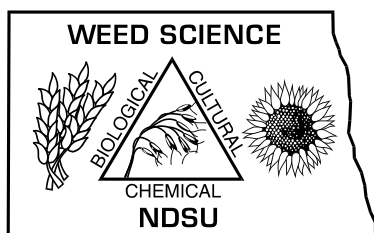


Pesticide Use and Pest Management Practices in North Dakota, 2012



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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 respondents 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. Notice for pesticide users: Read, understand and follow all label directions and precautions.

INTRODUCTION

This is the ninth major account of pesticide usage in North Dakota and describes pesticide usage on agricultural land in 2012. 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, 2004⁷ and 2008⁸ 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, 32,608,400 in 2008⁸ and 35,594,100 in 2012 (Table 1). Changes in pesticide-treated acres 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 2012 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 treated crop acreage: with each pesticide group and 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, flax, canola, sugarbeet, alfalfa hay, other hay, CRP, pasture and fallow were requested for the 2012 crop year. Safflower, mustard, and potato were omitted for this survey.

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 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 2013.

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 2012 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.

Questions were developed to query respondents on pest management decisions and practices, whether they had a current private or commercial pesticide applicators license, extent to which they read a pesticide label before application, reasons for not reading a pesticide label and where respondents get their pesticide use information.

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 February through mid-April 2013. A total of 2,511 usable surveys was obtained.

Of the producers surveyed for 2012, 31% grew wheat, 8% barley, 6% oat, 20% corn, 21% soybean, 3% dry bean, 2% field pea, 1% lentil, 5% sunflower, 3% flax, 8% canola, 1% sugarbeet, 25% alfalfa, 21% other hay, 39% CRP, 35% pasture and 3% fallow. These values are higher than the 2008 survey for soybean, canola, and CRP; they are the same for corn, lentil and fallow; and less for all other crops surveyed.

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. Kimmet. 1980. Pesticide Usage in Major North Dakota Crops, 1978. 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. 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.

⁸ Zollinger, R., M. McMullen, J. Knodel, J. Gray, D. Jantzi, G. Kimmet, K. Hagemeister and C. Schmitt. 2009. Pesticide Use and Pest Management Practices for Major Crops in North Dakota, 2008. North Dakota State University in cooperation with North Dakota Agricultural Statistics Service, Extension Publication W-1446. 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		
2012	21.4	4.0	8.1
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 combined surveyed crop, hay, pasture, CRP and summer fallow land (Table 1).

	Herbicides	Insecticides	Fungicides
	% of land		
2012	57.3	10.7	21.6
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	.4

Total acres planted to treated seed (Table 1):

2012	14.7 million
2008	12.1 million
2004	8.5 million
2000	7.8 million
1996	9.8 million

Total treated seed (Table 1).

	2012	2008	2004	2000	1996
	%				
Wheat	48.4	43.6	35.0	33.5	45.3
Barley	59.8	49.2	42.1	39.6	50.9
Corn	96.3	92.8	81.1	73.4	79.4
Soybean	81.7	55.9	31.4	17.9	9.5
Dry bean	86.0	90.9	84.8	63.2	84.3
Sunflower	89.4	92.1	82.4	78.9	76.5
Canola	84.5	80.0	87.7	81.6	76.2

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

2012	3.8 million
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	
2012	21,424,800	41,109,000
2008	21,367,100	41,139,100
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

Crops that 90% of acres were treated at least once with herbicides in 2012 (Table 1): wheat, barley, corn, soybean, dry bean, sunflower, flax, canola and sugarbeet. Less than 3% of alfalfa hay, other hay and pasture acres were treated with herbicides.

Insecticides were used on 4 million acres of the surveyed crops in 2012 (Table 1). This is similar to 2008. More than 10% of the surveyed crop acres were treated with an insecticide. Sunflower (61%), sugarbeet (53%), wheat (20%), soybean (22%) and canola (14%) had the highest percentage of insecticide-treated crop.

Total acreage treated with fungicide, exclusive of seed treatment, increased to 22% of the surveyed acres treated in 2012 (Table 1) compared with 15% in 2008 and 5.4% in 2004 of total cropland treated at least once. All crops surveyed showed a significant increase in fungicide use compared with use in 2008. This may have been a response to fungicide-resistant pathogens and more effective fungicides registered on many major and minor-use crops.

Unknown herbicide response for most crops was significantly larger in 2012 than previous surveys (Tables 6-23). Reasons for this response may have been because they could not remember herbicide names, they did not want to look at their records during the survey, their crop consultant kept that specific information or they chose not report specific herbicide products.

Table 1. Acreage planted, acreage treated and percentage of planted acreage treated with pesticides in surveyed crops, North Dakota, 2012.

Crop	Acres Planted ¹	Pesticide-treated Acres ²											
		Total		On-farm		Herbicide		Insecticide		Fungicide		Desiccants	
		Treated Seed	%	Treated Seed	%	1000	%	1000	%	1000	%	1000	%
Wheat	7840.0	3796.7	48.4	2908.6	37.1	7582.7	96.7	1585.9	20.2	5087.1	64.9	1186.9	15.1
Barley	1060	634.3	59.8	464.7	43.8	1019.6	96.2	115.3	10.9	594.3	56.1	3.3	0.3
Oat	200	5.6	2.8	1.1	0.5	103.0	51.5	0.3	0.1	7.9	3.9	4.0	2.0
Flax	315	9.5	3.0	3.2	1.0	293.0	93.0	15.7	5.0	24.5	7.8	88.8	28.2
Corn	3600	3465.4	96.3	0.8	0.0	3517.9	97.7	277.2	7.7	313.0	8.7	9.3	0.3
Sunflower	860	768.5	89.4	.	.	832.5	96.8	524.9	61.0	271.3	31.5	68.8	8.0
Soybean	4750	3881.8	81.7	365.7	7.7	4655.8	98.0	1057.3	22.3	697.9	14.7	3.3	0.1
Field pea	235	48.9	20.8	38.8	16.5	204.2	86.9	12.4	5.3	67.6	28.7	161.1	68.6
Lentil	160	16.2	10.1	4.6	2.9	128.2	80.1	.	.	69.9	43.7	103.9	64.9
Sugarbeet	222	189.1	85.2	7.2	3.3	209.5	94.4	117.6	53.0	209.5	94.4	.	.
Dry beans	700	602.1	86.0	0.2	0.0	687.5	98.2	64.7	9.2	327.8	46.8	354.6	50.7
Canola	1460	1234.1	84.5	8.8	0.6	1421.1	97.3	207.9	14.2	429.5	29.4	67.2	4.6
Alfalfa	1290	.	.	.	.	6.6	0.5	26.2	2.0	.	.	0.8	0.1
Other hay	900	.	.	.	.	13.5	1.5	0.0	0.0	.	.	0.8	0.1
CRP	2370.8	.	.	.	.	222.5	9.4	1.8	0.1	0.0	0.0	6.2	0.3
Fallow	1039.8	.	.	.	.	270.1	26.0	.	.	.	.	.	.
Pasture	10419	.	.	.	.	257.0	2.5	2.9	0.0	.	.	.	.
Total	37421.6	14652.3	39.2	3803.7	10.2	21424.8	57.3	4010.3	10.7	8100.1	21.6	2058.9	5.5

¹ Preliminary estimates by the National Agricultural Statistics Service with the following exceptions: Pasture acreage was taken from the 2007 census. Acreage for 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, 2012.

Districts	Acres Planted ¹	Pesticide-treated Acres ²											
		Total		On-farm		Herbicide		Insecticide		Fungicide		Desiccants	
		Treated Seed	%	Treated Seed	%	1000	%	1000	%	1000	%	1000	%
Northwest	4801.7	1203.8	25.1	652.0	13.6	3052.0	63.6	572.0	11.9	1511.5	31.5	298.4	6.2
North Central	2784.1	1106.6	39.7	157.6	5.7	1443.2	51.8	159.2	5.7	406.8	14.6	63.4	2.3
Northeast	3351.4	1914.4	57.1	110.6	3.3	2432.1	72.6	358.0	10.7	936.5	27.9	233.6	7.0
West Central	3944.7	1010.4	25.6	574.9	14.6	1606.1	40.7	177.7	4.5	721.0	18.3	147.7	3.7
Central	3763.3	1793.3	47.7	336.5	8.9	2208.1	58.7	412.3	11.0	475.9	12.6	259.0	6.9
East Central	2830.8	2030.8	71.7	151.1	5.3	2316.4	81.8	609.6	21.5	440.1	15.5	47.1	1.7
Southwest	4442.0	946.7	21.3	624.5	14.1	1414.6	31.8	158.4	3.6	860.3	19.4	89.1	2.0
South Central	3789.9	702.4	18.5	24.9	0.7	858.7	22.7	417.1	11.0	262.7	6.9	17.4	0.5
Southeast	3710.3	2047.7	55.2	83.4	2.2	2387.5	64.3	224.2	6.0	213.8	5.8	14.8	0.4
Comb. Districts ³	4003.4	1896.2	47.4	1088.3	27.2	3706.0	92.6	921.7	23.0	2271.5	56.7	888.4	22.2
Total	37421.6	14652.3	39.2	3803.7	10.2	21424.8	57.3	4010.3	10.7	8100.1	21.6	2058.9	5.5

¹ Preliminary estimates by the National Agricultural Statistics Service with the following exceptions: Pasture acreage was taken from the 2007 census. Acreage for 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

Crop/District	Acres Planted ¹	Pesticide-treated Acres ²											
		Total		On-farm		Herbicide		Insecticide		Fungicide		Desiccants	
		Treated	Seed	Treated	Seed	1000	%	1000	%	1000	%	1000	%
Wheat													
Northwest	1960.0	566.9	28.9	546.4	27.9	1903.4	97.1	386.8	19.7	1270.2	64.8	163.7	8.4
West Central	913.5	556.7	60.9	512.4	56.1	911.1	99.7	99.5	10.9	599.7	65.6	63.3	6.9
Central	475.1	302.8	63.7	158.7	33.4	461.6	97.2	195.1	41.1	233.4	49.1	185.5	39.0
Southwest	1166.5	714.3	61.2	604.2	51.8	1062.6	91.1	87.2	7.5	838.1	71.9	35.2	3.0
Combined districts: NC, NE, EC, SC, and SE	3324.9	1656.0	49.8	1086.9	32.7	3244.1	97.6	817.4	24.6	2145.8	64.5	739.3	22.2
Total	7840.0	3796.7	48.4	2908.6	37.1	7582.7	96.7	1585.9	20.2	5087.1	64.9	1186.9	15.1
Barley													
Northwest	215.5	111.7	51.8	75.2	34.9	213.3	99.0	36.8	17.1	106.6	49.5	.	.
North Central	262.5	184.7	70.4	145.4	55.4	247.3	94.2	14.4	5.5	175.4	66.8	.	.
Northeast	204.0	108.0	53.0	80.6	39.5	199.8	97.9	14.0	6.9	137.7	67.5	.	.
West Central	87.3	42.0	48.1	42.0	48.1	77.7	89.0	.	.	25.9	29.7	.	.
Central	124.0	80.2	64.7	52.1	42.0	124.0	100.0	29.7	24.0	62.8	50.6	.	.
East Central	46.1	43.9	95.2	25.1	54.3	46.1	100.0	12.0	26.1	27.7	60.0	.	.
Southwest	41.3	23.8	57.7	20.2	49.0	34.1	82.6	3.6	8.8	9.5	22.9	.	.
South Central	54.0	28.0	51.8	15.6	29.0	53.1	98.3	.	.	37.4	69.2	3.3	6.1
Southeast	25.3	12.0	47.4	8.5	33.5	24.3	96.2	4.8	18.8	11.5	45.3	.	.
Total	1060.0	634.3	59.8	464.7	43.8	1019.6	96.2	115.3	10.9	594.3	56.1	3.3	0.3
Oat													
Northwest	18.8	.	.	.	.	12.3	65.5	.	.	.	.	.	.
North Central	19.4	0.7	3.8	0.7	3.8	11.5	59.4	0.3	1.6	4.5	23.0	.	.
West Central	36.1	0.3	0.9	0.3	0.9	21.6	59.8	0.0	0.0	2.7	7.5	0.8	2.3
Central	20.4	.	.	.	.	14.2	69.4	.	.	.	.	.	.
East Central	3.3	.	.	.	.	3.1	93.0	.	.	.	.	.	.
South Central	56.9	.	.	.	.	28.5	50.1	.	.	.	.	3.1	5.5
Southeast	14.7	.	.	.	.	5.6	38.3	.	.	0.7	4.6	.	.
Combined districts: NE and SW	30.4	4.6	15.0	.	.	6.2	20.5	.	.	.	.	.	.
Total	200.0	5.6	2.8	1.1	0.5	103.0	51.5	0.3	0.1	7.9	3.9	4.0	2.0
Corn													
Northwest	44.5	44.5	100.0	.	.	44.5	100.0	.	.	1.9	4.2	.	.
North Central	208.5	202.0	96.9	0.2	0.1	204.9	98.3	11.9	5.7	35.7	17.1	.	.
Northeast	343.5	325.1	94.6	.	.	339.5	98.8	5.3	1.5	25.0	7.3	.	.
West Central	141.5	141.5	100.0	.	.	141.5	100.0	1.2	0.9	.	.	2.5	1.7
Central	471.5	453.5	96.2	.	.	454.7	96.4	2.4	0.5	8.3	1.8	.	.
East Central	853.0	845.2	99.1	.	.	819.7	96.1	62.4	7.3	69.9	8.2	2.1	0.2
Southwest	115.5	114.5	99.1	.	.	115.5	100.0	60.0	51.9	10.0	8.7	.	.
South Central	362.0	341.3	94.3	.	.	348.9	96.4	110.7	30.6	116.0	32.0	4.7	1.3
Southeast	1060.0	997.9	94.1	0.6	0.1	1048.8	98.9	23.3	2.2	46.3	4.4	0.0	0.0
Total	3600.0	3465.4	96.3	0.8	0.0	3517.9	97.7	277.2	7.7	313.0	8.7	9.3	0.3
Soybean													
Northwest	75.5	67.5	89.4	4.8	6.4	75.5	100.0	35.1	46.4	15.0	19.9	.	.
North Central	377.0	304.9	80.9	2.4	0.6	369.0	97.9	26.0	6.9	56.7	15.0	1.6	0.4
Northeast	770.0	574.3	74.6	22.5	2.9	752.3	97.7	147.3	19.1	124.6	16.2	0.0	0.0
Central	896.0	826.5	92.2	125.7	14.0	885.3	98.8	127.6	14.2	103.4	11.5	.	.
East Central	1284.0	993.1	77.3	126.0	9.8	1244.2	96.9	467.8	36.4	257.6	20.1	1.7	0.1
South Central	93.1	87.2	93.7	9.3	9.9	93.1	100.0	58.6	63.0	26.1	28.1	.	.
Southeast	1214.0	989.5	81.5	74.3	6.1	1196.0	98.5	187.4	15.4	114.5	9.4	.	.
Combined districts: WC and SW	40.4	38.7	95.9	0.6	1.5	40.4	100.0	7.6	18.8	.	.	.	.
Total	4750.0	3881.8	81.7	365.7	7.7	4655.8	98.0	1057.3	22.3	697.9	14.7	3.3	0.1

Table 3. Continued.

Crop/District	Acres Planted ¹	Pesticide-treated Acres ²											
		Total		On-farm		Herbicide		Insecticide		Fungicide		Desiccants	
		Treated Seed	Treated Seed	Herbicide	Insecticide	Fungicide	Desiccants	1000	%	1000	%	1000	%
Dry bean													
Northwest	8.5	.	.	.	.	.	.	.	.	.	.	.	.
North Central	58.5	58.5	100.0	.	.	58.5	100.0	.	.	20.3	34.8	20.3	34.8
Northeast	384.5	321.1	83.5	0.2	0.1	384.5	100.0	33.0	8.6	249.2	64.8	215.5	56.0
West Central	30.4	29.6	97.3	.	.	30.4	100.0	.	.	3.8	12.6	18.8	61.8
Central	73.7	58.9	79.9	.	.	73.7	100.0	.	.	5.6	7.6	31.4	42.6
East Central	104.0	100.7	96.8	.	.	104.0	100.0	28.7	27.6	37.0	35.5	43.3	41.7
Southeast	25.9	22.9	88.5	.	.	25.9	100.0	3.0	11.7	11.8	45.7	14.8	57.2
Combined districts: SW and SC	14.5	10.5	72.4	.	.	10.5	72.4	.	.	.	.	10.5	72.4
Total	700.0	602.1	86.0	0.2	0.0	687.5	98.2	64.7	9.2	327.8	46.8	354.6	50.7
Field pea													
Northwest	130.0	29.2	22.5	22.4	17.2	105.8	81.4	8.1	6.2	32.3	24.8	85.6	65.9
West Central	43.0	15.6	36.2	15.6	36.2	43.0	100.0	.	.	22.0	51.1	33.4	77.7
Southwest	30.6	.	.	.	.	30.3	98.9	2.3	7.6	.	.	27.9	91.3
Combined districts: NC NE, C, EC, and SC	31.4	4.1	13.1	0.8	2.5	25.2	80.3	2.0	6.3	13.3	42.4	14.2	45.2
Total	235.0	48.9	20.8	38.8	16.5	204.2	86.9	12.4	5.3	67.6	28.7	161.1	68.6
Lentil													
West Central	13.9	11.8	84.9	4.6	33.1	13.9	100.0	.	.	5.9	42.8	8.0	57.8
Combined districts: NW, NC, NE, C, EC, SW, SC and SE	146.1	4.4	3.0	.	.	114.3	78.3	.	.	63.9	43.7	95.9	65.6
Total	160.0	16.2	10.1	4.6	2.9	128.2	80.1	.	.	69.9	43.7	103.9	64.9
Sunflower													
Northwest	107.4	104.7	97.5	.	.	107.4	100.0	44.6	41.6	13.8	12.8	1.3	1.2
North Central	132.1	132.1	100.0	.	.	129.6	98.1	71.7	54.3	39.5	29.9	21.4	16.2
West Central	109.2	92.9	85.1	.	.	92.9	85.1	53.3	48.8	51.9	47.6	.	.
Central	42.3	42.3	100.0	.	.	41.0	97.0	41.6	98.4	38.1	90.1	21.2	50.1
South Central	246.8	225.0	91.2	.	.	246.8	100.0	219.2	88.8	81.3	32.9	2.3	0.9
Combined districts: NE, EC, SW, and SE	222.2	171.4	77.2	.	.	214.7	96.6	94.5	42.5	46.6	21.0	22.6	10.2
Total	860.0	768.5	89.4	.	.	832.5	96.8	524.9	61.0	271.3	31.5	68.8	8.0
Flax													
Northwest	128.5	3.2	2.5	3.2	2.5	123.2	95.9	1.9	1.5	20.7	16.1	46.5	36.2
North Central	39.9	.	.	.	.	36.2	90.7	2.6	6.6	.	.	8.0	20.2
West Central	48.9	.	.	.	.	44.5	91.0	.	.	.	.	19.8	40.5
Central	34.0	1.5	4.5	.	.	31.3	92.0	.	.	.	.	4.6	13.4
Southwest	18.0	.	.	.	.	14.4	80.1	.	.	.	.	.	.
South Central	23.6	.	.	.	.	21.5	91.1	10.9	46.0	2.0	8.3	3.9	16.6
Combined districts: NE, EC, and SE	22.1	4.8	21.7	.	.	21.8	98.6	0.3	1.5	1.9	8.4	6.0	27.0
Total	315.0	9.5	3.0	3.2	1.0	293.0	93.0	15.7	5.0	24.5	7.8	88.8	28.2

Table 3. Continued.

Crop/District	Acres Planted ¹	Pesticide-treated Acres ²											
		Total		On-farm		Herbicide		Insecticide		Fungicide		Desiccants	
		Treated Seed	Treated Seed	Herbicide	Insecticide	Fungicide	Desiccants	1000	%	1000	%	1000	%
Canola		1000	%	1000	%	1000	%	1000	%	1000	%	1000	%
Northwest	328.5	276.0	84.0	0.0	0.0	325.9	99.2	56.0	17.1	51.1	15.6	1.3	0.4
North Central	253.0	223.7	88.4	8.8	3.5	251.9	99.6	32.3	12.8	74.7	29.5	12.0	4.8
Northeast	568.0	470.3	82.8	.	.	561.4	98.8	81.2	14.3	267.6	47.1	16.4	2.9
West Central	127.0	120.0	94.5	.	.	127.0	100.0	18.4	14.5	9.0	7.1	1.2	0.9
Central	37.8	27.5	72.8	.	.	37.8	100.0	10.3	27.2	24.3	64.3	10.3	27.2
East Central	114.5	94.1	82.2	.	.	88.5	77.3	2.7	2.4	2.7	2.4	26.0	22.7
Southwest	26.9	20.9	77.5	.	.	26.9	100.0	7.0	25.8	.	.	.	.
Combined districts: SC, and SE	4.3	1.7	39.5	.	.	1.7	39.5	.	.	.	.	.	.
Total	1460.0	1234.1	84.5	8.8	0.6	1421.1	97.3	207.9	14.2	429.5	29.4	67.2	4.6
Sugarbeet													
Northeast	132.5	115.7	87.3	7.2	5.5	132.5	100.0	77.2	58.3	132.5	100.0	.	.
East Central	48.0	48.0	100.0	.	.	48.0	100.0	38.6	80.5	48.0	100.0	.	.
Southeast	29.0	25.4	87.5	.	.	29.0	100.0	1.7	6.0	29.0	100.0	.	.
Total	222.0	189.1	85.2	7.2	3.3	209.5	94.4	117.6	53.0	209.5	94.4	.	.
Alfalfa													
Northwest	132.0	.	.	.	.	0.9	0.7	2.4	1.8	.	.	.	.
North Central	98.4	.	.	.	.	0.2	0.2	.	.	.	.	.	.
Northeast	23.2	.	.	.	.	0.0	0.0	.	.	.	.	0.4	1.5
West Central	215.5	.	.	.	.	1.2	0.6	5.4	2.5	.	.	.	.
Central	139.2	.	.	.	.	1.5	1.1	4.1	3.0	.	.	0.5	0.4
East Central	27.5	.	.	.	.	1.0	3.7	.	.	.	.	.	.
Southwest	271.0	.	.	.	.	1.0	0.4	2.5	0.9	.	.	.	.
South Central	267.5	.	.	.	.	0.4	0.1	7.8	2.9	.	.	.	.
Southeast	115.7	.	.	.	.	0.4	0.4	3.9	3.4	.	.	.	.
Total	1290.0	.	.	.	.	6.6	0.5	26.2	2.0	.	.	0.8	0.1
Other hay													
Northwest	70.7	.	.	.	.	0.0	0.0	.	.	.	.	.	.
North Central	143.4	.	.	.	.	3.0	2.1	0.0	0.0	.	.	.	.
Northeast	55.5	.	.	.	.	1.7	3.1	.	.	.	.	.	.
West Central	108.2	.	.	.	.	1.0	1.0	.	.	.	.	.	.
Central	124.7	.	.	.	.	1.2	1.0	.	.	.	.	0.8	0.6
East Central	23.7	.	.	.	.	1.3	5.5	.	.	.	.	.	.
Southwest	116.4	.	.	.	.	3.7	3.2	.	.	.	.	.	.
South Central	161.8	.	.	.	.	0.3	0.2	.	.	.	.	.	.
Southeast	95.6	.	.	.	.	1.2	1.2	.	.	.	.	.	.
Total	900.0	.	.	.	.	13.5	1.5	0.0	0.0	.	.	0.8	0.1
CRP													
Northwest	258.8	.	.	.	.	17.2	6.6	0.3	0.1	0.0	0.0	0.0	0.0
North Central	323.3	.	.	.	.	44.1	13.7	0.0	0.0	0.0	0.0	.	.
Northeast	485.9	.	.	.	.	48.5	10.0	0.0	0.0	0.0	0.0	1.4	0.3
West Central	84.4	.	.	.	.	5.2	6.2	.	.	.	.	.	.
Central	336.2	.	.	.	.	20.8	6.2	1.5	0.4	.	.	4.8	1.4
East Central	196.2	.	.	.	.	26.0	13.3	.	.	.	.	.	.
Southwest	247.8	.	.	.	.	20.4	8.3	.	.	.	.	.	.
South Central	134.0	.	.	.	.	11.4	8.5	.	.	.	.	.	.
Southeast	304.2	.	.	.	.	28.9	9.5	.	.	.	.	.	.
Total	2370.8	.	.	.	.	222.5	9.4	1.8	0.1	0.0	0.0	6.2	0.3

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	%
Pasture													
Northwest	1119.8	.	.	.	.	5.2	0.5	.	.	.	.	.	.
North Central	733.6	.	.	.	.	68.6	9.3	.	.	.	.	.	.
Northeast	183.6	.	.	.	.	4.7	2.5	.	.	.	.	.	.
West Central	1902.4	.	.	.	.	50.6	2.7	.	.	.	.	.	.
Central	828.6	.	.	.	.	23.6	2.8	.	.	.	.	.	.
East Central	173.5	.	.	.	.	14.8	8.5	.	.	.	.	.	.
Southwest	2320.4	.	.	.	.	44.2	1.9	.	.	.	.	.	.
South Central	2331.2	.	.	.	.	17.9	0.8	2.9	0.1	.	.	.	.
Southeast	825.9	.	.	.	.	27.4	3.3	.	.	.	.	.	.
Total	10419.0	.	.	.	.	257.0	2.5	2.9	0.0	.	.	.	.
Fallow													
Northwest	200.0	.	.	.	.	117.3	58.6	.	.	.	.	.	.
North Central	134.5	.	.	.	.	18.3	13.6	.	.	.	.	.	.
Northeast	200.7	.	.	.	.	7.3	3.6	.	.	.	.	.	.
West Central	74.1	.	.	.	.	44.5	60.0	.	.	.	.	.	.
Central	159.8	.	.	.	.	37.5	23.4	.	.	.	.	.	.
East Central	71.5	.	.	.	.	8.3	11.6	.	.	.	.	.	.
South Central	32.1	.	.	.	.	9.9	30.8	.	.	.	.	.	.
Combined districts: SW and SE	167.1	.	.	.	.	27.1	16.2	.	.	.	.	.	.
Total	1039.8	.	.	.	.	270.1	26.0	.	.	.	.	.	.

¹ Preliminary estimates by the National Agricultural Statistics Service with the following exceptions: Pasture acreage was taken from the 2011 census. Acreage for 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

Treatment	Acres		Treatment Method				
	Seeded ¹	Seeded	Drill Box		Auger		Other
	1000	%	%	%	%	%	
Wheat							
Atrazine + S-Metolachlor,	13.8	0.2	.	100.0	.	.	
Carboxin	19.2	0.2	.	100.0	.	.	
Carboxin, Captan	35.4	0.5	10.6	89.4	.	.	
Carboxin, Thiram	28.2	0.4	.	100.0	.	.	
Chlorpropham	14.2	0.2	.	100.0	.	.	
Difenoconazole + Mefenoxam	5.1	0.1	.	.	.	100.0	
Endosulfan + Piperonyl butoxide + Pyrethrins	6.0	0.1	.	100.0	.	.	
Fludioxonil	6.0	0.1	.	100.0	.	.	
Fluroxypyr + Clopyralid	6.8	0.1	.	.	.	100.0	
Glyphosate	64.1	0.8	.	100.0	.	.	
Imazalil + Metalaxyl + Tebuconazole	115.1	1.5	.	87.2	12.8	.	
Imidacloprid + Imazalil + Metalaxyl + Tebuconazole	363.1	4.6	13.5	83.2	3.4	.	
Imidacloprid + Metalaxyl + Tebuconazole	684.6	8.7	14.4	83.6	2.0	.	
Ipconazole	47.6	0.6	100.0	.	.	.	
Lindane	13.6	0.2	.	100.0	.	.	
Mancozeb	13.6	0.2	.	100.0	.	.	
Metalaxyl + Tebuconazole	5.2	0.1	.	100.0	.	.	
Pinoxaden	19.5	0.2	.	89.5	10.5	.	
Propiconazole + Trifloxystrobin	39.0	0.5	.	.	.	100.0	
Prothioconazole	16.2	0.2	.	100.0	.	.	
Pyraclostrobin	109.9	1.4	.	85.6	14.4	.	
Tebuconazole	3.4	0.0	.	.	.	100.0	
Thiamethoxam	12.4	0.2	16.9	83.1	.	.	
Thiram + Carboxin	32.0	0.4	.	100.0	.	.	
Thiram + Tebuconazole	26.1	0.3	.	82.7	17.3	.	
Tritconazole	186.2	2.4	.	100.0	.	.	
Tritconazole + Metalaxyl	72.0	0.9	.	100.0	.	.	
Unknown or Other	972.9	12.4	8.4	81.9	8.7	.	
Total	2931.3	37.4	9.6	83.1	6.9		

Table 4. Continued.

Treatment	Acres Seeded ¹	Acres Seeded	Treatment Method		
			Drill Box	Auger	Other
Barley					
Carboxin + Thiram	2.3	0.2	.	100.0	.
Difenoconazole + Mefenoxam	1.5	0.1	.	.	100.0
Imazalil + Metalaxyl + Tebuconazole	15.7	1.5	.	76.0	24.0
Imidacloprid + Imazalil + Metalaxyl + Tebuconazole	86.9	8.2	.	100.0	.
Imidacloprid + Metalaxyl + Tebuconazole	143.7	13.6	8.4	91.6	.
Pinoxaden	7.8	0.7	.	100.0	.
Pyraclostrobin	2.2	0.2	.	100.0	.
Thiamethoxam	9.0	0.8	.	58.7	41.3
Thiram, Carboxin	17.9	1.7	55.9	44.1	.
Tritconazole	27.4	2.6	.	100.0	.
Tritconazole + Metalaxyl	4.0	0.4	.	100.0	.
Vinclozolin	8.6	0.8	.	100.0	.
Unknown or Other	147.3	13.9	8.1	90.6	1.3
Total	474.3	44.7	7.2	90.5	2.3
Oat					
Imidacloprid + Imazalil + Metalaxyl + Tebuconazole	0.7	0.4	.	100.0	.
Imidacloprid + Metalaxyl + Tebuconazole	0.3	0.2	.	100.0	.
Total	1.1	0.5	.	100.0	.
Soybean					
Endosulfan	14.0	0.3	.	100.0	.
Mefenoxam + Fludioxonil	81.6	1.7	9.8	61.1	29.1
Thiamethoxam	15.3	0.3	.	30.0	70.0
Thiamethoxam + Fludioxonil	43.3	0.9	18.5	74.3	7.3
Unknown or Other	249.7	5.3	19.8	21.7	58.5
Total	403.9	8.5	16.2	38.3	45.5
Field pea					
Mefenoxam,	7.2	3.1	100.0	.	.
Mefenoxam, Fludioxonil,	14.2	6.0	.	100.0	.
Pyraclostrobin,	14.0	5.9	.	100.0	.
Unknown or Other	3.5	1.5	77.1	.	22.9
Total	38.8	16.5	25.4	72.5	2.1
Flax					
Unknown or Other	3.2	1.0	.	100.0	.
Total	3.2	1.0	.	100.0	.
Canola					
Cyfluthrin	3.9	0.3	.	.	100.0
EPTC	10.0	0.7	.	.	100.0
Glufosinate	32.7	2.2	17.8	.	82.2
Glyphosate	40.0	2.7	.	.	100.0
Imidacloprid	66.6	4.6	.	.	100.0
Mancozeb + Imidacloprid	13.2	0.9	.	.	100.0
Mancozeb + Thiophanate + Imidacloprid	11.9	0.8	.	.	100.0
Mefenoxam + Fludioxonil	2.5	0.2	.	.	100.0
Peroxyacetic acid + Hydrogen peroxide	1.6	0.1	.	.	100.0
S-Metolachlor + Glyphosate + Mesotrione	55.6	3.8	.	.	100.0
Thiamethoxam	23.3	1.6	.	.	100.0
Thiamethoxam + Fludioxonil	13.2	0.9	.	.	100.0
Unknown or Other	961.5	65.9	2.4	4.6	92.3
Total	1235.8	84.6	2.3	3.6	93.6

Table 5. ON-FARM SEED TREATMENT BY ACTIVE INGREDIENT: Total acres treated, percent of surveyed

Treatment	Acres	Acres	Treatment Method		
	Seeded ¹	Seeded	Drill Box	Auger	Other
	1000.0	%	%	%	%
Atrazine + S-Metolachlor	13.8	0.2	.	100.0	.
Carboxin	19.2	0.2	.	100.0	.
Carboxin, Captan	35.4	0.5	10.6	89.4	.
Carboxin, Thiram	30.5	0.3	.	100.0	.
Chlorpropham	14.2	0.2	.	100.0	.
Cyfluthrin	3.9	0.3	.	.	100.0
Difenoconazole + Mefenoxam	6.6	0.1	.	.	100.0
EPTC	10.0	0.7	.	.	100.0
Endosulfan	14.0	0.3	.	100.0	.
Endosulfan + Piperonyl butoxide + Pyrethrins	6.0	0.1	.	100.0	.
Fludioxonil	6.0	0.1	.	100.0	.
Fluroxypyr + Clopyralid	6.8	0.1	.	.	100.0
Glufosinate	32.7	2.2	17.8	.	82.2
Glyphosate	90.5	1.0	.	70.8	29.2
Glyphosate	13.6	0.9	.	.	100.0
Imazalil + Metalaxyl + Tebuconazole	130.7	1.5	.	85.8	14.2
Imidacloprid	66.6	4.6	.	.	100.0
Imidacloprid + Imazalil + Metalaxyl + Tebuconazole	450.7	5.0	10.8	86.4	2.7
Imidacloprid + Metalaxyl + Tebuconazole	828.6	9.1	13.3	85.0	1.7
Ipconazole	47.6	0.6	100.0	.	.
Lindane	13.6	0.2	.	100.0	.
Mancozeb	13.6	0.2	.	100.0	.
Mancozeb + Imidacloprid	13.2	0.9	.	.	100.0
Mancozeb + Thiophanate + Imidacloprid	11.9	0.8	.	.	100.0
Mefenoxam	7.2	3.1	100.0	.	.
Mefenoxam + Fludioxonil	98.3	1.5	8.1	65.2	26.7
Metalaxyl + Tebuconazole	5.2	0.1	.	100.0	.
Peroxyacetic acid + Hydrogen peroxide	1.6	0.1	.	.	100.0
Pinoxaden	27.3	0.3	.	92.5	7.5
Propiconazole + Trifloxystrobin	39.0	0.5	.	.	100.0
Prothioconazole	16.2	0.2	.	100.0	.
Pyraclostrobin	126.1	1.4	.	87.4	12.6
S-Metolachlor + Glyphosate + Mesotrione	55.6	3.8	.	.	100.0
Tebuconazole	3.4	0.0	.	.	100.0
Thiamethoxam	60.0	0.4	3.5	33.6	62.8
Thiamethoxam + Fludioxonil	56.5	0.9	14.2	56.9	28.9
Thiram + Carboxin	50.0	0.6	20.0	80.0	.
Thiram + Tebuconazole	26.1	0.3	.	82.7	17.3
Tritconazole	213.6	2.4	.	100.0	.
Tritconazole + Metalaxyl	75.9	0.9	.	100.0	.
Vinclozolin	8.6	0.8	.	100.0	.
Unknown or Other	2338.1	14.9	7.2	44.1	48.0
Total	5088.5	32.1	8.3	60.9	30.5

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, 2012.¹

Herbicide	Acres	Acres	Applications					Operator/ Applicator		Method of Application	
	Treated ²	Treated	1x	2x	3x	4x	5x	Farm	Custom	Aerial	Ground
	1000	%	%	%	%	%	%	%	%	%	%
2,4-D	500.2	6.4	97.4	2.6	.	.	.	90.4	9.6	.	100.0
2,4-D + Bromoxynil	31.1	0.4	100.0	.	.	.	.	83.7	16.3	.	100.0
2,4-D + Dicamba	117.4	1.5	100.0	.	.	.	.	100.0	.	.	100.0
2,4-D + Glyphosate	9.9	0.1	100.0	.	.	.	.	100.0	.	.	100.0
2,4-D + Clopyralid	5.8	0.1	100.0	.	.	.	.	77.3	22.7	.	100.0
2,4-D + Picloram	0.3	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Atrazine + Rimsulfuron + Nicosulfuron	3.9	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Bromoxynil	8.9	0.1	100.0	.	.	.	.	.	100.0	.	100.0
Bromoxynil + Fenoxaprop + Pyrasulfotole	659.1	8.4	100.0	.	.	.	.	83.8	16.2	8.3	91.7
Bromoxynil + Pyrasulfotole	287.4	3.7	100.0	.	.	.	.	66.3	33.7	.	100.0
Bromoxynil + Pyrasulfotole + Thiencazabzone	447.5	5.7	100.0	.	.	.	.	91.4	8.6	.	100.0
Carfentrazone	30.2	0.4	100.0	.	.	.	.	100.0	.	.	100.0
Chlorimuron	75.2	1.0	100.0	.	.	.	.	100.0	.	.	100.0
Chlorsulfuron	1.5	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Clodinafop	294.3	3.8	100.0	.	.	.	.	80.9	19.1	.	100.0
DCPA	7.1	0.1	100.0	.	.	.	.	.	100.0	100.0	.
Dicamba	41.2	0.5	100.0	.	.	.	.	88.6	11.4	.	100.0
Dicamba + Diflufenzopyr + Nicosulfuron	15.1	0.2	100.0	.	.	.	.	100.0	.	.	100.0
Fenoxaprop	475.9	6.1	100.0	.	.	.	.	76.6	23.4	2.8	97.2
Flucarbazone	795.2	10.1	100.0	.	.	.	.	84.9	15.1	8.9	91.1
Flucarbazone + Chlorsulfuron	16.5	0.2	100.0	.	.	.	.	77.8	22.2	.	100.0
Flufenacet + Metribuzin	17.0	0.2	100.0	.	.	.	.	66.3	33.7	.	100.0
Fluroxypyr	30.4	0.4	100.0	.	.	.	.	77.2	22.8	.	100.0
Fluroxypyr + Clopyralid	3083.6	39.3	99.8	0.2	.	.	.	90.7	9.3	0.7	99.3
Fluroxypyr Pyroxulam	575.0	7.3	95.2	4.8	.	.	.	93.5	6.5	0.5	99.5
Fluthiacet	7.9	0.1	100.0	.	.	.	.	50.0	50.0	.	100.0
Glyphosate	1280.3	16.3	99.5	0.5	.	.	.	78.5	21.5	5.5	94.5
Imazamox	22.0	0.3	100.0	.	.	.	.	100.0	.	.	100.0
MCPA	310.0	4.0	100.0	.	.	.	.	85.0	15.0	2.1	97.9
MCPA + Bromoxynil	554.6	7.1	100.0	.	.	.	.	80.6	19.4	0.3	99.7
MCPA + Fluroxypyr	62.3	0.8	100.0	.	.	.	.	54.4	45.6	1.8	98.2
MCPA + Fluroxypyr + Clopyralid	3.7	0.0	100.0	.	.	.	.	.	100.0	.	100.0
Norflurazon	18.0	0.2	100.0	.	.	.	.	79.9	20.1	.	100.0
Pendimethalin	1.1	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Pendimethalin + Atrazine	2.3	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Pinoxaden	1026.2	13.1	100.0	.	.	.	.	89.0	11.0	0.2	99.8
Propoxycarbazone + Mesosulfuron	36.7	0.5	100.0	.	.	.	.	100.0	.	.	100.0
Metolachlor + Glyphosate + Mesotrione	11.8	0.2	100.0	.	.	.	.	100.0	.	.	100.0
Saflufenacil	4.2	0.1	100.0	.	.	.	.	.	100.0	.	100.0
Sethoxydim	39.4	0.5	100.0	.	.	.	.	100.0	.	.	100.0
Sulfentrazone	41.1	0.5	100.0	.	.	.	.	100.0	.	.	100.0
Thifensulfuron + Tribenuron	1506.5	19.2	100.0	.	.	.	.	86.4	13.6	0.2	99.8
Tribenuron	68.9	0.9	100.0	.	.	.	.	100.0	.	.	100.0
Trifluralin + Flumetsulam	19.2	0.2	100.0	.	.	.	.	.	100.0	.	100.0
Trifluralin + Imazethapyr	4.1	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Unknown herbicide	2614.6	33.3	90.6	8.9	0.5	.	.	71.2	28.8	5.2	94.8
Total	15172.4	193.5	98.0	1.9	0.1	.	.	83.4	16.6	2.6	97.4
Insecticide											
Bifenthrin	12.1	0.2	100.0	.	.	.	.	100.0	.	.	100.0
Chlorpyrifos	518.2	6.6	100.0	.	.	.	.	81.8	18.2	8.9	91.1
Cyfluthrin	12.5	0.2	100.0	.	.	.	.	30.8	69.2	.	100.0
Esfenvalerate	16.2	0.2	100.0	.	.	.	.	100.0	.	.	100.0
Lambda-cyhalothrin	324.4	4.1	100.0	.	.	.	.	82.3	17.7	18.5	81.5
Permethrin	9.0	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Piperonyl butoxide + Pyrethrin	13.2	0.2	100.0	.	.	.	.	100.0	.	.	100.0
Sodium dichloroisocyanurate dihydrate	0.4	0.0	100.0	.	.	.	.	.	100.0	.	100.0
Thiamethoxam	0.8	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Unknown insecticide	680.0	8.7	94.8	5.2	.	.	.	60.6	39.4	11.7	88.3
Total	1586.8	20.2	97.8	2.2	.	.	.	73.0	27.0	11.7	88.3

Fungicide

Captan + Lindane	5.3	0.1	100.0	.	.	.	100.0	.	.	100.0
Carboxin	9.6	0.1	100.0	.	.	.	100.0	.	.	100.0
Carboxin + Permethrin	13.7	0.2	100.0	.	.	.	100.0	.	.	100.0
Carboxin + Thiram	18.1	0.2	100.0	.	.	.	100.0	.	.	100.0
Copper hydroxide	6.8	0.1	100.0	.	.	.	100.0	.	.	100.0
Imazalil + Metalaxyl + Tebuconazole	3.9	0.1	100.0	.	.	.	100.0	100.0	.	.
Metalaxyl	11.8	0.2	100.0	.	.	.	100.0	.	.	100.0
Metalaxyl + Tebuconazole	13.9	0.2	100.0	.	.	.	100.0	100.0	.	.
Propiconazole	1326.9	16.9	99.4	0.6	.	.	90.3	9.7	6.1	93.9
Propiconazole + Azoxystrobin	152.5	1.9	100.0	.	.	.	88.1	11.9	6.0	94.0
Propiconazole + Trifloxystrobin	63.9	0.8	100.0	.	.	.	66.9	33.1	4.5	95.5
Prothioconazole	106.5	1.4	100.0	.	.	.	90.9	9.1	2.1	97.9
Prothioconazole + Tebuconazole	679.1	8.7	100.0	.	.	.	77.9	22.1	14.9	85.1
Pyraclostrobin	970.7	12.4	82.2	9.3	8.5	.	77.2	22.8	13.3	86.7
Tebuconazole	528.8	6.7	94.8	5.2	.	.	73.2	26.8	22.5	77.5
Tetraconazole	11.9	0.2	100.0	.	.	.	100.0	.	.	100.0
Unknown fungicide	1307.1	16.7	97.6	2.4	.	.	76.6	23.4	6.5	93.5
Total	5230.5	66.7	95.4	3.0	1.6	.	80.9	19.1	10.5	89.5

Desiccant

Unknown desiccant	596.8	7.6	74.8	25.2	.	.	83.1	16.9	7.6	92.4
Total	596.8	7.6	74.8	25.2	.	.	83.1	16.9	7.6	92.4

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 percent of the planted acres.

Table 7. BARLEY: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2012.¹

	Acres		Applications					Operator/ Applicator		Method of Application	
	Treated ² 1000	Treated %	1x %	2x %	3x %	4x %	5x %	Farm %	Custom %	Aerial %	Ground %
Herbicide											
2,4-D	50.0	4.7	100.0	.	.	.	.	90.9	9.1	.	100.0
2,4-D + Dicamba	4.6	0.4	100.0	.	.	.	.	100.0	.	.	100.0
Atrazine + Dicamba	4.1	0.4	100.0	.	.	.	.	100.0	.	.	100.0
Bromoxynil + Fenoxaprop + Pyrasulfotole	59.2	5.6	100.0	.	.	.	.	91.1	8.9	.	100.0
Bromoxynil + Pyrasulfotole	35.3	3.3	100.0	.	.	.	.	100.0	.	.	100.0
Bromoxynil + Pyrasulfotole + Thiencazabone	13.2	1.2	100.0	.	.	.	.	100.0	.	.	100.0
Clethodim	6.6	0.6	100.0	.	.	.	.	100.0	.	.	100.0
Clodinafop	12.3	1.2	100.0	.	.	.	.	.	100.0	.	100.0
Dicamba + Diflufenzopyr	15.8	1.5	100.0	.	.	.	.	100.0	.	.	100.0
Fenoxaprop	73.9	7.0	100.0	.	.	.	.	92.4	7.6	.	100.0
Flucarbazone + Chlorsulfuron	7.9	0.7	100.0	.	.	.	.	100.0	.	.	100.0
Fluroxypyr Clopyralid	444.8	42.0	100.0	.	.	.	.	84.5	15.5	.	100.0
Fluroxypyr Pyroxulam	4.6	0.4	100.0	.	.	.	.	100.0	.	.	100.0
Glyphosate	33.0	3.1	100.0	.	.	.	.	100.0	.	.	100.0
MCPA	52.6	5.0	100.0	.	.	.	.	97.0	3.0	.	100.0
MCPA + Bromoxynil	56.8	5.4	100.0	.	.	.	.	94.2	5.8	.	100.0
MCPA + Fluroxypyr	10.1	1.0	100.0	.	.	.	.	.	100.0	.	100.0
Pinoxaden	397.6	37.5	100.0	.	.	.	.	84.6	15.4	2.3	97.7
Propoxycarbazone + Mesosulfuron	3.5	0.3	100.0	.	.	.	.	100.0	.	.	100.0
S-Metolachlor + Glyphosate + Mesotrione	3.5	0.3	100.0	.	.	.	.	100.0	.	.	100.0
Thifensulfuron + Tribenuron	220.5	20.8	100.0	.	.	.	.	85.2	14.8	.	100.0
Tribenuron	7.5	0.7	100.0	.	.	.	.	100.0	.	.	100.0
Unknown herbicide	233.2	22.0	85.0	15.0	.	.	.	65.4	34.6	5.8	94.2
Total	1750.7	165.0	98.0	2.0	.	.	.	83.6	16.4	1.3	98.7
Insecticide											
Chlorpyrifos	7.0	0.7	100.0	.	.	.	.	42.8	57.2	.	100.0
Lambda-cyhalothrin	54.2	5.1	100.0	.	.	.	.	85.2	14.8	.	100.0
Unknown insecticide	66.8	6.3	52.5	47.5	.	.	.	96.8	3.2	21.8	78.2
Total	128.0	12.1	75.2	24.8	.	.	.	89.0	11.0	11.3	88.7
Fungicide											
Propiconazole	129.2	12.2	100.0	.	.	.	.	81.1	18.9	15.3	84.7
Propiconazole + Azoxystrobin	19.3	1.8	100.0	.	.	.	.	85.5	14.5	14.5	85.5
Propiconazole + Trifloxystrobin	5.4	0.5	100.0	.	.	.	.	100.0	.	.	100.0
Prothioconazole	11.4	1.1	100.0	.	.	.	.	100.0	.	.	100.0
Prothioconazole + Tebuconazole	184.3	17.4	100.0	.	.	.	.	83.1	16.9	10.9	89.1
Pyraclostrobin	89.8	8.5	100.0	.	.	.	.	83.6	16.4	7.2	92.8
Tebuconazole	75.6	7.1	88.8	11.2	.	.	.	75.5	24.5	24.5	75.5
Unknown fungicide	99.4	9.4	100.0	.	.	.	.	77.4	22.6	10.1	89.9
Total	614.4	58.0	98.6	1.4	.	.	.	81.4	18.6	12.6	87.4
Desiccant											
Unknown Desiccant	9.9	0.9	100.0	.	.	.	.	.	100.0	.	100.0
Total	9.9	0.9	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 percent of the planted acres.

Table 8. OAT: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2012.¹

	Acres	Acres	Applications					Operator/ Applicator		Method of Application	
	Treated ²	Treated	1x	2x	3x	4x	5x	Farm	Custom	Aerial	Ground
	1000	%	%	%	%	%	%	%	%	%	%
Herbicide											
2,4-D	25.3	12.6	100.0	.	.	.	.	70.1	29.9	.	100.0
2,4-D + Dicamba	2.9	1.5	100.0	.	.	.	.	.	100.0	.	100.0
Dicamba	1.6	0.8	100.0	.	.	.	.	100.0	.	.	100.0
Fluroxypyr + Clopyralid	23.2	11.6	83.0	17.0	.	.	.	68.5	31.5	.	100.0
Glyphosate	5.0	2.5	100.0	.	.	.	.	100.0	.	.	100.0
MCPA	17.2	8.6	100.0	.	.	.	.	96.0	4.0	.	100.0
MCPA + Bromoxynil	9.4	4.7	100.0	.	.	.	.	58.3	41.7	.	100.0
MCPA + Fluroxypyr	1.9	1.0	100.0	.	.	.	.	.	100.0	.	100.0
Thifensulfuron + Tribenuron	2.9	1.5	100.0	.	.	.	.	34.6	65.4	.	100.0
Unknown herbicide	33.1	16.6	100.0	.	.	.	.	52.8	47.2	0.3	99.7
Total	122.4	61.2	96.8	3.2	.	.	.	65.8	34.2	0.1	99.9
Insecticide											
Lambda-cyhalothrin	0.3	0.2	100.0	.	.	.	.	100.0	.	.	100.0
Total	0.3	0.2	100.0	.	.	.	.	100.0	.	.	100.0
Fungicide											
Propiconazole	2.3	1.2	100.0	.	.	.	.	100.0	.	.	100.0
Propiconazole + Trifloxystrobin	0.3	0.2	100.0	.	.	.	.	100.0	.	.	100.0
Prothioconazole + Tebuconazole	1.6	0.8	100.0	.	.	.	.	100.0	.	.	100.0
Pyraclostrobin	0.7	0.3	100.0	.	.	.	.	.	100.0	.	100.0
Unknown fungicide	1.1	0.6	100.0	.	.	.	.	29.4	70.6	.	100.0
Total	6.0	3.0	100.0	.	.	.	.	75.5	24.5	.	100.0
Desiccant											
Unknown desiccant	4.0	2.0	100.0	.	.	.	.	79.0	21.0	.	100.0
Total	4.0	2.0	100.0	.	.	.	.	79.0	21.0	.	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 percent of the planted acres.

Table 9. CORN: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2012.¹

	Acres Treated ²	Acres Treated %	Applications					Operator/ Applicator		Method of Application	
			1x %	2x %	3x %	4x %	5x %	Farm %	Custom %	Aerial %	Ground %
Herbicide											
2,4-D + Dicamba	46.7	1.3	100.0	.	.	.	.	86.8	13.2	.	100.0
2,4-D + Glyphosate	6.5	0.2	.	100	.	.	.	100.0	.	.	100.0
Acetochlor	35.6	1.0	100.0	.	.	.	.	77.3	22.7	.	100.0
Acetochlor + Atrazine	177.9	4.9	100.0	.	.	.	.	96.5	3.5	.	100.0
Acetochlor + Clopyralid + Flumetsulam	117.3	3.3	100.0	.	.	.	.	100.0	.	.	100.0
Atrazine	146.3	4.1	95.1	4.9	.	.	.	93.2	6.8	.	100.0
Atrazine + Bromoxynil	52.2	1.4	100.0	.	.	.	.	100.0	.	.	100.0
Clethodim	3.6	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Cyanazine + Atrazine	1.9	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Dicamba	8.8	0.2	100.0	.	.	.	.	100.0	.	.	100.0
Dicamba + Diflufenzopyr	532.9	14.8	97.1	2.9	.	.	.	87.2	12.8	4.0	96.0
Dicamba + Imazethapyr	5.9	0.2	100.0	.	.	.	.	100.0	.	.	100.0
Dimethenamid	32.6	0.9	100.0	.	.	.	.	87.2	12.8	.	100.0
Dimethenamid + Saflufenacil	46.1	1.3	100.0	.	.	.	.	74.6	25.4	.	100.0
Flumiclorac	13.9	0.4	100.0	.	.	.	.	100.0	.	.	100.0
Fluroxypyr + Clopyralid	21.0	0.6	82.0	18.0	.	.	.	80.2	19.8	.	100.0
Fluthiacet	9.7	0.3	100.0	.	.	.	.	100.0	.	.	100.0
Glyphosate	3824.5	106.2	44.3	53.2	2.5	.	.	85.0	15.0	0.5	99.5
Isoxaflutole	47.1	1.3	100.0	.	.	.	.	79.8	20.2	.	100.0
MCPA + Bromoxynil	2.6	0.1	100.0	.	.	.	.	100.0	.	.	100.0
MCPA + Fluroxypyr	28.0	0.8	100.0	.	.	.	.	100.0	.	.	100.0
Mesotrione	37.7	1.0	100.0	.	.	.	.	96.8	3.2	.	100.0
Norflurazon	2.8	0.1	100.0	.	.	.	.	.	100.0	.	100.0
S-Metolachlor	2.0	0.1	100.0	.	.	.	.	.	100.0	.	100.0
S-Metolachlor + Atrazine + Mesotrione	31.7	0.9	100.0	.	.	.	.	28.6	71.4	.	100.0
S-Metolachlor + Glyphosate + Mesotrione	16.2	0.5	100.0	.	.	.	.	100.0	.	.	100.0
Saflufenacil	10.3	0.3	100.0	.	.	.	.	100.0	.	.	100.0
Tembotrione	124.7	3.5	65.1	34.9	.	.	.	89.2	10.8	.	100.0
Thifensulfuron + Tribenuron	26.9	0.7	100.0	.	.	.	.	100.0	.	.	100.0
Trifluralin	7.1	0.2	.	100	.	.	.	100.0	.	.	100.0
Unknown herbicide	1452.4	40.3	43.3	55.1	1.5	.	.	81.3	18.7	.	100.0
Total	6872.8	191.0	55.8	42.5	1.7	.	.	85.2	14.8	0.6	99.4
Insecticide											
Bifenthrin + Zeta-cypermethrin	3.7	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Carbaryl	1.7	0.0	100.0	.	.	.	.	.	100.0	100.0	.
Chlorpyrifos	51.8	1.4	100.0	.	.	.	.	90.6	9.4	9.4	90.6
Clothianidin	5.4	0.1	100.0	.	.	.	.	.	100.0	.	100.0
Lambda-cyhalothrin	49.2	1.4	100.0	.	.	.	.	79.0	21.0	21.0	79.0
Unknown insecticide	119.0	3.3	96.2	3.8	.	.	.	88.9	11.1	.	100.0
Total	230.6	6.4	98.0	2.0	.	.	.	84.6	15.4	7.3	92.7
Fungicide											
Metaxyl + Tebuconazole	6.1	0.2	100.0	.	.	.	.	100.0	.	.	100.0
Propiconazole	30.9	0.9	100.0	.	.	.	.	100.0	.	.	100.0
Propiconazole + Trifloxystrobin	22.6	0.6	100.0	.	.	.	.	.	100.0	7.9	92.1
Pyraclostrobin	124.0	3.4	87.3	12.7	.	.	.	75.6	24.4	10.2	89.8
Tetraconazole	2.6	0.1	100.0	.	.	.	.	.	100.0	100.0	.
Unknown fungicide	117.4	3.3	100.0	.	.	.	.	91.9	8.1	.	100.0
Total	303.7	8.4	94.8	5.2	.	.	.	78.6	21.4	5.6	94.4
Desiccant											
Unknown desiccant and Total	2.7	0.1	100.0	.	.	.	.	.	100.0	77.5	22.5

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 percent of the planted acres.

Table 10. SOYBEAN: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2012.¹

	Acres		Applications					Operator/ Applicator		Method of Application	
	Treated ² 1000	Treated %	1x %	2x %	3x %	4x %	5x %	Farm %	Custom %	Aerial %	Ground %
Herbicide											
2,4-D + Glyphosate	25.1	0.5	. 100	.	.	.	.	100.0	.	.	100.0
Acetochlor + Atrazine	9.7	0.2	100.0	.	.	.	.	100.0	.	.	100.0
Atrazine + Glufosinate	2.4	0.1	100.0	.	.	.	.	.	100.0	.	100.0
Bentazon	5.0	0.1	36.6	63.4	.	.	.	36.6	63.4	.	100.0
Carfentrazone	1.2	0.0	100.0	.	.	.	.	.	100.0	.	100.0
Clethodim	77.2	1.6	52.8	47.2	.	.	.	97.8	2.2	.	100.0
Dicamba + Imazethapyr	17.1	0.4	100.0	.	.	.	.	.	100.0	.	100.0
Dimethenamid + Saflufenacil	4.5	0.1	100.0	.	.	.	.	41.3	58.7	.	100.0
Fluazifop	18.0	0.4	100.0	.	.	.	.	88.8	11.2	.	100.0
Flumiclorac	101.9	2.1	96.7	3.3	.	.	.	82.1	17.9	.	100.0
Flumioxazin	41.0	0.9	100.0	.	.	.	.	67.7	32.3	.	100.0
Fluroxypyr + Clopyralid	10.5	0.2	.	100	.	.	.	100.0	.	.	100.0
Fluroxypyr + Pyroxulam + Kantor	4.1	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Fluthiacet	79.2	1.7	90.1	9.9	.	.	.	54.6	45.4	.	100.0
Fomesafen	35.4	0.7	100.0	.	.	.	.	25.4	74.6	.	100.0
Glufosinate	45.8	1.0	26.4	73.6	.	.	.	77.5	22.5	22.5	77.5
Glyphosate + Imazethapyr	243.9	5.1	81.3	18.7	.	.	.	91.6	8.4	3.3	96.7
Glyphosate	6166.8	129.8	20.0	77.9	2.1	.	.	82.7	17.3	1.5	98.5
Imazamox	174.3	3.7	92.8	7.2	.	.	.	100.0	.	.	100.0
Imazethapyr	68.5	1.4	95.4	4.6	.	.	.	95.4	4.6	.	100.0
Paraquat + Diuron	18.8	0.4	.	100	.	.	.	100.0	.	.	100.0
Pendimethalin	8.0	0.2	100.0	.	.	.	.	100.0	.	100.0	.
Quizalofop	23.1	0.5	18.9	81.1	.	.	.	93.2	6.8	.	100.0
Saflufenacil	13.2	0.3	100.0	.	.	.	.	100.0	.	.	100.0
Sethoxydim	17.9	0.4	97.6	2.4	.	.	.	95.2	4.8	.	100.0
Sulfentrazone	99.3	2.1	100.0	.	.	.	.	53.5	46.5	5.2	94.8
Trifluralin + Flumetsulam	4.6	0.1	100.0	.	.	.	.	.	100.0	.	100.0
Unknown herbicide	2040.7	43.0	21.8	73.4	4.8	.	.	81.7	18.3	0.8	99.2
Total	9387.0	197.6	28.1	69.5	2.4	.	.	82.4	17.6	1.5	98.5
Insecticide											
Bifenthrin	10.5	0.2	100.0	.	.	.	.	100.0	.	.	100.0
Bifenthrin + Zeta-cypermethrin	36.4	0.8	100.0	.	.	.	.	100.0	.	.	100.0
Carbofuran	0.4	0.0	100.0	.	.	.	.	.	100.0	.	100.0
Chlorpyrifos	264.6	5.6	95.0	5.0	.	.	.	84.8	15.2	11.7	88.3
Chlorpyrifos + Gamma-cyhalothrin	5.8	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Cyfluthrin	12.0	0.3	100.0	.	.	.	.	100.0	.	.	100.0
Esfenvalerate	98.2	2.1	100.0	.	.	.	.	98.8	1.2	.	100.0
Lambda-cyhalothrin	201.7	4.2	96.1	3.9	.	.	.	92.9	7.1	4.9	95.1
Sulfur	14.4	0.3	100.0	.	.	.	.	50.0	50.0	.	100.0
Thiamethoxam + Fludioxonil	1.0	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Unknown insecticide	405.6	8.5	90.9	.	9.1	.	.	70.3	29.7	2.3	97.7
Total	1050.7	22.1	94.5	2.0	3.5	.	.	82.5	17.5	4.8	95.2
Fungicide											
Mefenoxam + Fludioxonil	0.9	0.0	100.0	.	.	.	.	.	100.0	.	100.0
Metalaxyl + Tebuconazole	5.3	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Propiconazole	27.0	0.6	100.0	.	.	.	.	70.8	29.2	.	100.0
Propiconazole + Trifloxystrobin	83.9	1.8	100.0	.	.	.	.	73.0	27.0	12.3	87.7
Prothioconazole	2.7	0.1	100.0	.	.	.	.	50.0	50.0	.	100.0
Pyraclostrobin	362.0	7.6	96.6	3.4	.	.	.	82.2	17.8	2.9	97.1
Thiophanatel	28.6	0.6	100.0	.	.	.	.	100.0	.	.	100.0
Unknown fungicide	97.3	2.0	97.8	2.2	.	.	.	74.0	26.0	29.9	70.1
Total	607.6	12.8	97.6	2.4	.	.	.	79.8	20.2	8.2	91.8
Desiccant											
Unknown desiccant and Total	34.6	0.7	100.0	.	.	.	.	95.0	5.0	.	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 percent of the planted acres.

Table 11. DRY BEAN: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2012.¹

	Acres	Acres	Applications					Operator/ Applicator		Method of Application	
	Treated ²	Treated	1x	2x	3x	4x	5x	Farm	Custom	Aerial	Ground
	1000	%	%	%	%	%	%	%	%	%	%
Herbicide											
2,4-D	0.8	0.1	100.0	.	.	.	.	100.0	.	.	100.0
2,4-D + Dicamba	9.6	1.4	100.0	.	.	.	.	100.0	.	.	100.0
Bentazon	46.9	6.7	69.4	30.6	.	.	.	95.1	4.9	.	100.0
Bromoxynil	10.5	1.5	100.0	.	.	.	.	100.0	.	.	100.0
Clethodim	65.8	9.4	75.8	24.2	.	.	.	60.3	39.7	.	100.0
Dicamba + Imazethapyr	65.9	9.4	17.2	82.8	.	.	.	100.0	.	.	100.0
Ethalfuralin	98.9	14.1	100.0	.	.	.	.	56.3	43.7	.	100.0
Fluazifop	3.0	0.4	100.0	.	.	.	.	.	100.0	.	100.0
Flumioxazin	62.8	9.0	100.0	.	.	.	.	65.7	34.3	5.3	94.7
Fomesafen	44.8	6.4	50.8	49.2	.	.	.	84.8	15.2	.	100.0
Glyphosate	160.7	23.0	53.3	46.7	.	.	.	100.0	.	.	100.0
Imazamox	257.6	36.8	90.3	1.8	7.9	.	.	85.0	15.0	.	100.0
Imazethapyr	52.0	7.4	69.4	30.6	.	.	.	69.4	30.6	.	100.0
Paraquat	25.7	3.7	100.0	.	.	.	.	83.8	16.2	13.0	87.0
Pendimethalin	89.0	12.7	82.1	17.9	.	.	.	66.9	33.1	3.8	96.2
Propoxycarbazono + Mesosulfuron	22.1	3.2	100.0	.	.	.	.	100.0	.	.	100.0
Quizalofop	13.6	1.9	.	100	.	.	.	.	100.0	.	100.0
Saflufenacil	54.6	7.8	.	100	.	.	.	100.0	.	.	100.0
Sethoxydim	491.0	70.1	79.9	20.1	.	.	.	91.1	8.9	.	100.0
Sulfentrazone	49.9	7.1	100.0	.	.	.	.	100.0	.	.	100.0
Trifluralin	31.1	4.4	100.0	.	.	.	.	100.0	.	.	100.0
Trifluralin + Imazethapyr	15.9	2.3	100.0	.	.	.	.	100.0	.	.	100.0
Unknown herbicide	121.5	17.4	93.3	6.7	.	.	.	76.1	23.9	.	100.0
Total	1793.7	256.2	76.9	21.9	1.1	.	.	84.5	15.5	0.6	99.4
Insecticide											
Bifenthrin	77.3	11.0	29.4	70.6	.	.	.	100.0	.	.	100.0
Chlorpyrifos	17.4	2.5	100.0	.	.	.	.	100.0	.	.	100.0
Esfenvalerate	30.1	4.3	100.0	.	.	.	.	100.0	.	.	100.0
Lambda-cyhalothrin	12.1	1.7	100.0	.	.	.	.	100.0	.	.	100.0
Unknown insecticide	4.1	0.6	100.0	.	.	.	.	.	100.0	.	100.0
Total	141.0	20.1	61.3	38.7	.	.	.	97.1	2.9	.	100.0
Fungicide											
Boscalid	22.7	3.2	100.0	.	.	.	.	70.0	30.0	.	100.0
Prothioconazole	3.6	0.5	100.0	.	.	.	.	100.0	.	.	100.0
Pyraclostrobin	67.1	9.6	76.3	23.7	.	.	.	76.3	23.7	.	100.0
Thiophanate	127.6	18.2	19.8	80.2	.	.	.	39.8	60.2	.	100.0
Unknown fungicide	97.6	13.9	100.0	.	.	.	.	86.5	13.5	4.7	95.3
Total	318.7	45.5	62.9	37.1	.	.	.	64.6	35.4	1.4	98.6
Desiccant											
Unknown desiccant	200.2	28.6	64.0	36.0	.	.	.	95.2	4.8	2.8	97.2
Total	200.2	28.6	64.0	36.0	.	.	.	95.2	4.8	2.8	97.2

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 percent of the planted acres.

Table 12. DRY PEA: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2012.¹

	Acres		Applications					Operator/ Applicator		Method of Application	
	Treated ² 1000	Treated %	1x %	2x %	3x %	4x %	5x %	Farm %	Custom %	Aerial %	Ground %
Herbicide											
2,4-D + Glyphosate	2.0	0.8	100.0	.	.	.	.	100.0	.	.	100.0
Clethodim	11.5	4.9	100.0	.	.	.	.	100.0	.	62.4	37.6
Flumioxazin	1.4	0.6	100.0	.	.	.	.	.	100.0	.	100.0
Glyphosate + Imazethapyr	8.1	3.4	100.0	.	.	.	.	100.0	.	.	100.0
Glyphosate	12.1	5.2	100.0	.	.	.	.	88.2	11.8	.	100.0
Imazamox	7.2	3.1	100.0	.	.	.	.	100.0	.	.	100.0
Imazethapyr	1.5	0.6	100.0	.	.	.	.	100.0	.	.	100.0
Paraquat	79.8	34.0	100.0	.	.	.	.	91.5	8.5	5.6	94.4
Pendimethalin	8.1	3.4	100.0	.	.	.	.	100.0	.	.	100.0
Quizalofop	59.1	25.1	100.0	.	.	.	.	81.8	18.2	.	100.0
Saflufenacil	8.1	3.4	100.0	.	.	.	.	100.0	.	.	100.0
Sethoxydim	81.7	34.8	100.0	.	.	.	.	92.3	7.7	4.4	95.6
Sulfentrazone	7.3	3.1	100.0	.	.	.	.	100.0	.	.	100.0
Unknown herbicide	71.5	30.4	100.0	.	.	.	.	95.0	5.0	.	100.0
Total	359.2	152.9	100.0	.	.	.	.	91.6	8.4	4.2	95.8
Insecticide											
Lambda-cyhalothrin	2.0	0.8	100.0	.	.	.	.	100.0	.	.	100.0
Total	2.0	0.8	100.0	.	.	.	.	100.0	.	.	100.0
Fungicide											
Pyraclostrobin	67.0	28.5	100.0	.	.	.	.	93.3	6.7	6.7	93.3
Total	67.0	28.5	100.0	.	.	.	.	93.3	6.7	6.7	93.3
Desiccant											
Unknown desiccant	103.3	43.9	84.4	15.6	.	.	.	75.5	24.5	6.9	93.1
Total	103.3	43.9	84.4	15.6	.	.	.	75.5	24.5	6.9	93.1

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 percent of the planted acres.

Table 13. LENTIL: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2012.¹

	Acres		Applications					Operator/ Applicator		Method of Application	
	Treated ² 1000	Treated %	1x %	2x %	3x %	4x %	5x %	Farm %	Custom %	Aerial %	Ground %
Herbicide											
Clethodim	8.0	5.0	100.0	.	.	.	.	100.0	.	.	100.0
Flumioxazin	47.1	29.4	100.0	.	.	.	.	100.0	.	.	100.0
Glyphosate	50.5	31.6	100.0	.	.	.	.	100.0	.	.	100.0
Imazamox	5.9	3.7	100.0	.	.	.	.	100.0	.	.	100.0
Paraquat	16.1	10.1	100.0	.	.	.	.	57.8	42.2	.	100.0
Pendimethalin	7.1	4.4	100.0	.	.	.	.	.	100.0	.	100.0
Quizalofop	98.5	61.6	100.0	.	.	.	.	79.7	20.3	.	100.0
Unknown herbicide	15.7	9.8	88.0	12.0	.	.	.	43.2	56.8	.	100.0
Total	248.9	155.5	99.2	0.8	.	.	.	82.8	17.2	.	100.0
Insecticide											
Cyfluthrin	9.4	5.9	.	100	.	.	.	.	100.0	.	100.0
Ethyl parathion	47.1	29.4	100.0	.	.	.	.	100.0	.	.	100.0
Total	56.5	35.3	83.3	16.7	.	.	.	83.3	16.7	.	100.0
Fungicide											
Pyraclostrobin	66.2	41.4	100.0	.	.	.	.	96.4	3.6	3.6	96.4
Unknown fungicide	1.3	0.8	100.0	.	.	.	.	100.0	.	.	100.0
Total	67.5	42.2	100.0	.	.	.	.	96.5	3.5	3.5	96.5
Desiccant											
Unknown desiccant	29.2	18.2	100.0	.	.	.	.	14.3	85.7	.	100.0
Total	29.2	18.2	100.0	.	.	.	.	14.3	85.7	.	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 percent of the planted acres.

Table 14. SUNFLOWER: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2012.¹

	Acres	Acres	Applications					Operator/ Applicator		Method of Application	
	Treated ²	Treated	1x	2x	3x	4x	5x	Farm	Custom	Aerial	Ground
	1000	%	%	%	%	%	%	%	%	%	%
Herbicide											
2,4-D	5.3	0.6	100.0	.	.	.	.	100.0	.	.	100.0
Carfentrazone	26.8	3.1	100.0	.	.	.	.	100.0	.	.	100.0
Clethodim	172.3	20.0	97.1	2.9	.	.	.	87.6	12.4	5.2	94.8
Ethalfuralin	1.3	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Fluroxypyr + Pyroxulam + Kantor	108.7	12.6	5.8	94.2	.	.	.	100.0	.	47.1	52.9
Glyphosate	137.0	15.9	86.4	13.6	.	.	.	59.2	40.8	1.7	98.3
Imazamethabenz	16.7	1.9	100.0	.	.	.	.	100.0	.	.	100.0
Imazamox	194.0	22.6	100.0	.	.	.	.	87.6	12.4	.	100.0
Quizalofop	54.1	6.3	90.1	9.9	.	.	.	100.0	.	.	100.0
Saflufenacil	7.4	0.9	100.0	.	.	.	.	.	100.0	.	100.0
Sethoxydim	9.7	1.1	100.0	.	.	.	.	100.0	.	.	100.0
Sulfentrazone	206.0	24.0	97.6	2.4	.	.	.	90.6	9.4	.	100.0
Tribenuron	108.0	12.6	100.0	.	.	.	.	89.9	10.1	.	100.0
Unknown herbicide	416.6	48.4	91.9	8.1	.	.	.	84.7	15.3	3.9	96.1
Total	1463.8	170.2	88.4	11.6	.	.	.	86.1	13.9	5.4	94.6
Insecticide											
Carbaryl	2.3	0.3	100.0	.	.	.	.	.	100.0	100.0	.
Chlorpyrifos	23.9	2.8	100.0	.	.	.	.	.	100.0	81.1	18.9
Cyfluthrin	12.1	1.4	100.0	.	.	.	.	32.5	67.5	67.5	32.5
Esfenvalerate	116.9	13.6	76.6	23.4	.	.	.	60.8	39.2	36.3	63.7
Lambda-cyhalothrin	101.3	11.8	100.0	.	.	.	.	56.9	43.1	33.0	67.0
Sulfur	36.5	4.2	100.0	.	.	.	.	100.0	.	.	100.0
Unknown insecticide	248.9	28.9	95.9	4.1	.	.	.	52.0	48.0	54.7	45.3
Total	541.8	63.0	93.1	6.9	.	.	.	55.1	44.9	44.6	55.4
Fungicide											
Propiconazole	3.9	0.5	100.0	.	.	.	.	100.0	.	.	100.0
Pyraclostrobin	187.9	21.8	100.0	.	.	.	.	39.5	60.5	54.1	45.9
Tebuconazole	11.9	1.4	100.0	.	.	.	.	31.6	68.4	68.4	31.6
Unknown fungicide	99.4	11.6	100.0	.	.	.	.	17.2	82.8	82.8	17.2
Total	303.2	35.3	100.0	.	.	.	.	32.7	67.3	63.4	36.6
Desiccant											
Unknown desiccant	45.3	5.3	100.0	.	.	.	.	58.8	41.2	24.7	75.3
Total	45.3	5.3	100.0	.	.	.	.	58.8	41.2	24.7	75.3

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 percent of the planted acres.

Table 15. FLAX: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2012.¹

	Acres		Applications					Operator/ Applicator		Method of Application	
	Treated ² 1000	Treated %	1x %	2x %	3x %	4x %	5x %	Farm %	Custom %	Aerial %	Ground %
Herbicide											
Bentazon	1.9	0.6	100.0	.	.	.	.	100.0	.	.	100.0
Bromacil + Diuron	1.5	0.5	100.0	.	.	.	.	100.0	.	.	100.0
Bromoxynil	9.4	3.0	100.0	.	.	.	.	100.0	.	.	100.0
Clethodim	77.1	24.5	100.0	.	.	.	.	86.5	13.5	.	100.0
Glyphosate	55.7	17.7	100.0	.	.	.	.	75.1	24.9	4.1	95.9
MCPA	9.9	3.1	100.0	.	.	.	.	84.5	15.5	.	100.0
MCPA + Bromoxynil	124.2	39.4	98.3	1.7	.	.	.	80.3	19.7	7.5	92.5
MCPA + Clopyralid	12.1	3.9	100.0	.	.	.	.	100.0	.	.	100.0
Quizalofop	17.5	5.5	100.0	.	.	.	.	100.0	.	.	100.0
Sethoxydim	2.0	0.6	100.0	.	.	.	.	100.0	.	.	100.0
Sulfentrazone	17.8	5.7	100.0	.	.	.	.	100.0	.	.	100.0
Unknown herbicide	178.6	56.7	95.1	4.9	.	.	.	60.2	39.8	12.0	88.0
Total	507.7	161.2	97.9	2.1	.	.	.	76.1	23.9	6.5	93.5
Insecticide											
Chlorpyrifos + Gamma-cyhalothrin	3.9	1.2	100.0	.	.	.	.	100.0	.	.	100.0
Lambda-cyhalothrin	4.6	1.4	100.0	.	.	.	.	100.0	.	.	100.0
Unknown insecticide	6.2	2.0	100.0	.	.	.	.	.	100.0	31.6	68.4
Total	14.7	4.7	100.0	.	.	.	.	57.7	42.3	13.3	86.7
Fungicide											
Prothioconazole + Tebuconazole	1.6	0.5	100.0	.	.	.	.	100.0	.	.	100.0
Pyraclostrobin	12.8	4.1	100.0	.	.	.	.	58.3	41.7	41.7	58.3
Unknown fungicide	10.0	3.2	100.0	.	.	.	.	80.5	19.5	19.5	80.5
Total	24.5	7.8	100.0	.	.	.	.	70.1	29.9	29.9	70.1
Desiccant											
Unknown desiccant	52.2	16.6	100.0	.	.	.	.	66.2	33.8	22.0	78.0
Total	52.2	16.6	100.0	.	.	.	.	66.2	33.8	22.0	78.0

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 percent of the planted acres.

Table 16. CANOLA: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2012.¹

	Acres		Applications					Operator/ Applicator		Method of Application	
	Treated ² 1000	Treated %	1x %	2x %	3x %	4x %	5x %	Farm %	Custom %	Aerial %	Ground %
Herbicide											
Atrazine + Glufosinate	14.8	1.0	100.0	.	.	.	.	42.6	57.4	.	100.0
Clethodim	110.5	7.6	100.0	.	.	.	.	93.0	7.0	.	100.0
Flumioxazin	4.7	0.3	100.0	.	.	.	.	100.0	.	.	100.0
Glufosinate	512.7	35.1	97.0	3.0	.	.	.	97.4	2.6	.	100.0
Glyphosate	812.7	55.7	67.0	33.0	.	.	.	94.2	5.8	4.1	95.9
Imazamox	14.4	1.0	100.0	.	.	.	.	100.0	.	.	100.0
Paraquat	25.4	1.7	100.0	.	.	.	.	100.0	.	.	100.0
Pendimethalin + Atrazine	9.0	0.6	100.0	.	.	.	.	100.0	.	.	100.0
Propanil + Molinate	5.3	0.4	100.0	.	.	.	.	100.0	.	.	100.0
Quizalofop	81.0	5.5	59.7	40.3	.	.	.	100.0	.	.	100.0
Unknown herbicide	302.4	20.7	80.2	19.8	.	.	.	86.3	13.7	0.7	99.3
Total	1892.9	129.7	80.1	19.9	.	.	.	93.8	6.2	1.9	98.1
Insecticide											
Bifenthrin	2.0	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Chlorpyrifos	6.6	0.5	100.0	.	.	.	.	100.0	.	.	100.0
Cyfluthrin	3.1	0.2	100.0	.	.	.	.	.	100.0	100.0	.
Lambda-cyhalothrin	85.5	5.9	95.2	4.8	.	.	.	90.6	9.4	9.4	90.6
Unknown insecticide	92.4	6.3	100.0	.	.	.	.	98.6	1.4	.	100.0
Total	189.5	13.0	97.8	2.2	.	.	.	93.4	6.6	5.9	94.1
Fungicide											
Propiconazole	17.7	1.2	100.0	.	.	.	.	100.0	.	.	100.0
Propiconazole+ Azoxystrobin	19.9	1.4	100.0	.	.	.	.	100.0	.	.	100.0
Prothioconazole	149.5	10.2	88.0	12.0	.	.	.	94.2	5.8	19.9	80.1
Pyraclostrobin	31.2	2.1	100.0	.	.	.	.	79.3	20.7	20.7	79.3
Tebuconazole	15.5	1.1	100.0	.	.	.	.	100.0	.	.	100.0
Thiophanatel	16.3	1.1	100.0	.	.	.	.	100.0	.	.	100.0
Vinclozolin	19.5	1.3	100.0	.	.	.	.	79.7	20.3	20.3	79.7
Unknown fungicide	153.4	10.5	100.0	.	.	.	.	65.8	34.2	15.0	85.0
Total	422.9	29.0	95.8	4.2	.	.	.	83.1	16.9	14.9	85.1
Desiccant											
Diquat	1.2	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Unknown desiccant	44.3	3.0	100.0	.	.	.	.	51.2	48.8	35.7	64.3
Total	45.4	3.1	100.0	.	.	.	.	52.5	47.5	34.8	65.2

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 percent of the planted acres.

Table 17. SUGARBEET: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2012.¹

	Acres	Acres	Applications					Operator/ Applicator		Method of Application	
	Treated ²	Treated	1x	2x	3x	4x	5x	Farm	Custom	Aerial	Ground
	1000	%	%	%	%	%	%	%	%	%	%
Herbicide											
Clethodim	1.7	0.8	100.0	.	.	.	.	100.0	.	.	100.0
Glyphosate	451.9	203.6	4.4	39.2	56.4	.	.	91.1	8.9	6.6	93.4
Unknown herbicide	52.5	23.7	16.3	42.4	41.3	.	.	71.1	28.9	.	100.0
Total	506.1	228.0	6.0	39.4	54.6	.	.	89.0	11.0	5.9	94.1
Insecticide											
Bifenthrin	15.3	6.9	100.0	.	.	.	.	100.0	.	.	100.0
Chlorpyrifos	43.8	19.7	100.0	.	.	.	.	100.0	.	.	100.0
Clothianidin	3.1	1.4	100.0	.	.	.	.	100.0	.	.	100.0
Mineral oil	15.3	6.9	100.0	.	.	.	.	100.0	.	.	100.0
Terbufos	20.3	9.1	100.0	.	.	.	.	100.0	.	.	100.0
Unknown insecticide	77.1	34.7	88.7	11.3	.	.	.	85.0	15.0	15.0	85.0
Total	175.0	78.8	95.0	5.0	.	.	.	93.4	6.6	6.6	93.4
Fungicide											
Difenoconazole	4.9	2.2	100.0	.	.	.	.	100.0	.	.	100.0
Prothioconazole	70.1	31.6	100.0	.	.	.	.	100.0	.	.	100.0
Pyraclostrobin	189.6	85.4	100.0	0.0	.	.	.	81.1	18.9	14.1	85.9
Sulfur	8.7	3.9	100.0	.	.	.	.	100.0	.	.	100.0
Thiophanatel	23.5	10.6	100.0	.	.	.	.	81.4	18.6	18.6	81.4
Triphenyltin	55.5	25.0	100.0	.	.	.	.	77.8	22.2	22.2	77.8
Unknown fungicide	123.7	55.7	100.0	.	.	.	.	77.3	22.7	19.8	80.2
Total	475.9	214.4	100.0	0.0	.	.	.	83.1	16.9	14.3	85.7

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 percent of the planted acres.

Table 18. ALFALFA: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2012.¹

	Acres	Acres	Applications					Operator/ Applicator		Method of Application	
	Treated ²	Treated	1x	2x	3x	4x	5x	Farm	Custom	Aerial	Ground
	1000	%	%	%	%	%	%	%	%	%	%
Herbicide											
2,4-D	1.5	0.1	100.0	.	.	.	.	89.2	10.8	.	100.0
2,4-D + Dicamba	0.6	0.0	100.0	.	.	.	.	100.0	.	.	100.0
2,4-D + Picloram	0.3	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Glyphosate	2.0	0.2	84.6	15.4	.	.	.	33.1	66.9	.	100.0
Imazamox	0.3	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Imazapic	1.2	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Picloram	0.6	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Unknown herbicide	1.9	0.1	100.0	.	.	.	.	.	100.0	.	100.0
Total	8.4	0.7	96.3	3.7	.	.	.	59.3	40.7	.	100.0
Insecticide											
Chlorpyrifos	0.8	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Lambda-cyhalothrin	5.4	0.4	100.0	.	.	.	.	.	100.0	87.1	12.9
Malathion	0.9	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Unknown insecticide	17.4	1.3	100.0	.	.	.	.	39.3	60.7	10.2	89.8
Total	24.5	1.9	100.0	.	.	.	.	34.7	65.3	26.5	73.5

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 percent of the planted acres.

Table 19. OTHER HAY: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2012.¹

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	9.3	1.0	91.6	8.4	.	.	.	77.0	23.0	.	100.0
2,4-D + Dicamba	0.2	0.0	100.0	.	.	.	.	100.0	.	.	100.0
2,4-D + Picloram	2.3	0.3	93.4	.	.	.	6.6	100.0	.	.	100.0
Fluroxypyr + Clopyralid	0.1	0.0	100.0	.	.	.	.	.	100.0	100.0	.
Glyphosate	4.2	0.5	33.3	66.7	.	.	.	15.2	84.8	19.3	80.7
Imazapic	0.8	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Picloram	1.2	0.1	85.9	14.1	.	.	.	100.0	.	.	100.0
Topramezone	0.2	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Unknown herbicide	4.6	0.5	39.9	60.1	.	.	.	36.8	63.2	.	100.0
Total	22.9	2.5	71.0	28.3	.	.	0.7	62.1	37.9	4.0	96.0

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 percent of the planted acres.

Table 20. CRP: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2012.¹

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	96.9	4.1	86.2	4.5	9.3	.	.	76.7	23.3	8.1	91.9
2,4-D + Dicamba	0.8	0.0	100.0	.	.	.	.	100.0	.	.	100.0
2,4-D + Clopyralid	34.3	1.4	90.9	6.4	2.7	.	.	95.3	4.7	.	100.0
2,4-D + Picloram	24.7	1.0	96.2	3.8	.	.	.	55.2	44.8	9.1	90.9
Dicamba	1.1	0.0	100.0	.	.	.	.	.	100.0	.	100.0
Fluroxypyr +Clopyralid	3.2	0.1	98.4	1.6	.	.	.	100.0	.	.	100.0
Glyphosate	81.3	3.4	8.0	9.2	.	0.1	82.7	11.4	88.6	0.1	99.9
Imazapic	4.7	0.2	48.9	51.1	.	.	.	100.0	.	.	100.0
MCPA	0.7	0.0	100.0	.	.	.	.	100.0	.	.	100.0
MCPA + Bromoxynil	3.2	0.1	100.0	.	.	.	.	100.0	.	.	100.0
MCPA + Clopyralid	2.3	0.1	100.0	.	.	.	.	26.8	73.2	.	100.0
Metsulfuron	0.6	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Picloram	6.1	0.3	91.9	8.1	.	.	.	100.0	.	.	100.0
Thifensulfuron + Tribenuron	0.3	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Unknown herbicide	81.7	3.4	90.3	9.7	.	.	.	26.3	73.7	30.3	69.7
Total	341.9	14.4	69.9	7.6	2.9	0.0	19.7	50.2	49.8	10.2	89.8

Insecticide	Acres	Acres	Applications					Operator/ Applicator		Method of Application	
	Treated ² 1000	Treated %	1x %	2x %	3x %	4x %	5x %	Farm %	Custom %	Aerial %	Ground %
Cyfluthrin	2.1	0.1	100.0	.	.	.	.	.	100.0	.	100.0
Total	2.1	0.1	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 percent of the planted acres.

Table 21. PASTURE: Herbicide, insecticide and fungicide usage and application method, North Dakota, 2012.¹

	Acres		Applications					Operator/ Applicator		Method of application	
	Treated ² 1000	Treated %	1x %	2x %	3x %	4x %	5x %	Farm %	Custom %	Aerial %	Ground %
Herbicide											
2,4-D	116.8	1.1	98.1	1.9	.	.	.	79.8	20.2	8.0	92.0
2,4-D + Dicamba	12.6	0.1	100.0	.	.	.	.	100.0	.	.	100.0
2,4-D + Clopyralid	18.0	0.2	19.7	80.3	.	.	.	91.7	8.3	8.3	91.7
2,4-D + Picloram	46.0	0.4	100.0	.	.	.	.	91.1	8.9	8.9	91.1
Fluroxypyr + Clopyralid	0.6	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Glyphosate	13.8	0.1	96.8	.	3.2	.	.	100.0	.	.	100.0
Imazapic	22.5	0.2	100.0	.	.	.	.	100.0	.	.	100.0
MCPA + Bromoxynil	3.4	0.0	100.0	.	.	.	.	100.0	.	.	100.0
MCPA + Clopyralid	1.0	0.0	100.0	.	.	.	.	55.3	44.7	44.7	55.3
Metsulfuron	0.1	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Picloram	31.2	0.3	98.2	1.8	.	.	.	99.7	0.3	.	100.0
Trifluralin	0.6	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Unknown herbicide	85.2	0.8	97.8	2.2	.	.	.	40.5	59.5	4.3	95.7
Total	351.8	3.4	94.4	5.4	0.1	.	.	77.1	22.9	5.4	94.6
Insecticide											
Carbaryl	2.9	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Trimethacarb	0.5	0.0	100.0	.	.	.	.	100.0	.	100.0	.
Total	3.4	0.0	100.0	.	.	.	.	100.0	.	13.7	86.3

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 percent of the planted acres.

Table 22. FALLOW: Herbicide, Insecticide, and Fungicide usage and application method, North Dakota, 2012.¹

	Acres		Applications					Operator/ Applicator		Method of Application	
	Treated ² 1000	Treated %	1x %	2x %	3x %	4x %	5x %	Farm %	Custom %	Aerial %	Ground %
Herbicide											
2,4-D	8.9	0.9	100.0	.	.	.	.	.	100.0	.	100.0
2,4-D + Dicamba	38.2	3.7	.	100	.	.	.	.	100.0	.	100.0
2,4-D + Clopyralid	3.2	0.3	.	100	.	.	.	100.0	.	.	100.0
Glyphosate + Dicamba	5.0	0.5	59.3	40.7	.	.	.	100.0	.	.	100.0
Glyphosate	200.2	19.3	38.9	61.1	.	.	.	82.9	17.1	.	100.0
MCPA + Clopyralid	7.3	0.7	100.0	.	.	.	.	.	100.0	.	100.0
Unknown herbicide	43.3	4.2	38.2	61.8	.	.	.	94.7	5.3	.	100.0
Total	306.2	29.4	37.1	62.9	.	.	.	70.3	29.7	.	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 percent of the planted acres.

Table 23. HERBICIDE usage in North Dakota, 2012.¹

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	815.0	2.2	96.4	2.5	1.1	.	.	85.6	14.4	2.1	97.9
2,4-D+ Bromoxynil	31.1	0.1	100.0	.	.	.	.	83.7	16.3	.	100.0
2,4-D + Dicamba	233.6	0.6	83.6	16.4	.	.	.	79.8	20.2	.	100.0
2,4-D + Glyphosate	43.5	0.1	27.2	72.8	.	.	.	100.0	.	.	100.0
2,4-D + Clopyralid	61.2	0.2	66.1	32.3	1.5	.	.	92.8	7.2	2.4	97.6
2,4-D + Picloram	73.5	0.2	98.5	1.3	.	.	0.2	79.4	20.6	8.6	91.4
Acetochlor	35.6	0.1	100.0	.	.	.	.	77.3	22.7	.	100.0
Acetochlor + Atrazine	187.5	0.5	100.0	.	.	.	.	96.7	3.3	.	100.0
Acetochlor + Clopyralid + Flumetsulam	117.3	0.3	100.0	.	.	.	.	100.0	.	.	100.0
Atrazine	146.3	0.4	95.1	4.9	.	.	.	93.2	6.8	.	100.0
Atrazine + Bromoxynil	52.2	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Atrazine + Dicamba	4.1	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Atrazine + Glufosinate	17.2	0.0	100.0	.	.	.	.	36.7	63.3	.	100.0
Atrazine + Rimsulfuron + Nicosulfuron	3.9	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Bentazon	53.8	0.1	67.5	32.5	.	.	.	89.9	10.1	.	100.0
Bromacil + Diuron	1.5	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Bromoxynil	28.9	0.1	100.0	.	.	.	.	69.1	30.9	.	100.0
Bromoxynil + Fenoxaprop + Pyrasulfotole	718.3	1.9	100.0	.	.	.	.	84.4	15.6	7.6	92.4
Bromoxynil + Pyrasulfotole	322.7	0.9	100.0	.	.	.	.	70.0	30.0	.	100.0
Bromoxynil + Pyrasulfotole + Thiencarbazone	460.7	1.2	100.0	.	.	.	.	91.6	8.4	.	100.0
Carfentrazone	58.1	0.2	100.0	.	.	.	.	97.9	2.1	.	100.0
Chlorimuron	75.2	0.2	100.0	.	.	.	.	100.0	.	.	100.0
Chlorsulfuron	1.5	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Clethodim	534.3	1.4	89.3	10.7	.	.	.	87.4	12.6	3.0	97.0
Clodinafop	306.6	0.8	100.0	.	.	.	.	77.6	22.4	.	100.0
Clopyralid + Flumetsulam + Rimsulfuron + Nicosulfuron	8.2	0.0	100.0	.	.	.	.	.	100.0	.	100.0
Cyanazine + Atrazine	1.9	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Cytokinins + Indolebutyric acid + Gibberellin	17.1	0.0	100.0	.	.	.	.	100.0	.	.	100.0
DCPA	7.1	0.0	100.0	.	.	.	.	.	100.0	100.0	.
Dicamba	52.6	0.1	100.0	.	.	.	.	89.0	11.0	.	100.0
Dicamba + Diflufenzopyr	548.8	1.5	97.2	2.8	.	.	.	87.6	12.4	3.8	96.2
Dicamba + Diflufenzopyr + Nicosulfuron	15.1	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Dicamba + Imazethapyr	89.0	0.2	38.7	61.3	.	.	.	80.7	19.3	.	100.0
Dimethenamid	32.6	0.1	100.0	.	.	.	.	87.2	12.8	.	100.0
Dimethenamid + Saflufenacil	50.6	0.1	100.0	.	.	.	.	71.6	28.4	.	100.0
Ethalfuralin	100.2	0.3	100.0	.	.	.	.	56.9	43.1	.	100.0
Fenoxaprop	549.8	1.5	100.0	.	.	.	.	78.7	21.3	2.4	97.6
Fluazifop	21.0	0.1	100.0	.	.	.	.	76.2	23.8	.	100.0
Flucarbazone	795.2	2.1	100.0	.	.	.	.	84.9	15.1	8.9	91.1
Flucarbazone+ Chlorsulfuron	24.4	0.1	100.0	.	.	.	.	85.0	15.0	.	100.0
Flufenacet + Metribuzin	17.0	0.0	100.0	.	.	.	.	66.3	33.7	.	100.0
Flumiclorac	115.8	0.3	97.1	2.9	.	.	.	84.3	15.7	.	100.0
Flumioxazin	157.0	0.4	100.0	.	.	.	.	76.9	23.1	2.1	97.9
Fluroxypyr	30.4	0.1	100.0	.	.	.	.	77.2	22.8	.	100.0
Fluroxypyr + Clopyralid	3587.0	9.6	99.3	0.7	.	.	.	89.7	10.3	0.6	99.4
Fluroxypyr Pyroxsulam + Kantor	692.3	1.8	81.3	18.7	.	.	.	94.6	5.4	7.8	92.2
Fluthiacet	96.8	0.3	91.9	8.1	.	.	.	58.8	41.2	.	100.0
Fomesafen	80.2	0.2	72.5	27.5	.	.	.	58.6	41.4	.	100.0
Glufosinate	558.5	1.5	91.2	8.8	.	.	.	95.8	4.2	1.8	98.2
Glyphosate + Dicamba	5.0	0.0	59.3	40.7	.	.	.	100.0	.	.	100.0
Glyphosate + Imazethapyr	252.0	0.7	81.9	18.1	.	.	.	91.8	8.2	3.2	96.8
Glyphosate	13291.7	35.5	39.3	56.6	3.6	0.0	0.5	83.5	16.5	1.9	98.1
Imazamethabenz	16.7	0.0	100.0	.	.	.	.	100.0	.	.	100.0

Imazamox	675.6	1.8	94.4	2.5	3.0	.	.	90.7	9.3	.	100.0
Imazapic	29.2	0.1	91.8	8.2	.	.	.	100.0	.	.	100.0
Imazethapyr	122.0	0.3	84.4	15.6	.	.	.	84.4	15.6	.	100.0
Isoxaflutole	47.1	0.1	100.0	.	.	.	.	79.8	20.2	.	100.0
MCPA	390.4	1.0	100.0	.	.	.	.	87.1	12.9	1.7	98.3
MCPA + Bromoxynil	754.3	2.0	99.7	0.3	.	.	.	81.5	18.5	1.5	98.5
MCPA + Clopyralid	22.8	0.1	100.0	.	.	.	.	58.5	41.5	2.0	98.0
MCPA + Fluroxypyr	102.2	0.3	100.0	.	.	.	.	60.5	39.5	1.1	98.9
MCPA + Fluroxypyr + Clopyralid	3.7	0.0	100.0	.	.	.	.	.	100.0	.	100.0
Mesotrione	37.7	0.1	100.0	.	.	.	.	96.8	3.2	.	100.0
Metsulfuron	0.8	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Norflurazon	33.4	0.1	100.0	.	.	.	.	80.8	19.2	.	100.0
Paraquat	147.0	0.4	100.0	.	.	.	.	87.9	12.1	5.3	94.7
Paraquat + Diuron	18.8	0.1	.	100	.	.	.	100.0	.	.	100.0
Pendimethalin	113.2	0.3	85.9	14.1	.	.	.	67.8	32.2	10.0	90.0
Pendimethalin + Atrazine	11.3	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Picloram	39.2	0.1	96.9	3.1	.	.	.	99.7	0.3	.	100.0
Pinoxaden	1423.8	3.8	100.0	.	.	.	.	87.8	12.2	0.8	99.2
Propanil + Molinate	5.3	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Propoxycarbazone + Mesosulfuron	62.4	0.2	100.0	.	.	.	.	100.0	.	.	100.0
Quizalofop	346.9	0.9	79.7	20.3	.	.	.	86.7	13.3	.	100.0
S-Metolachlor	2.0	0.0	100.0	.	.	.	.	.	100.0	.	100.0
S-Metolachlor + Atrazine + Mesotrione	31.7	0.1	100.0	.	.	.	.	28.6	71.4	.	100.0
S-Metolachlor + Glyphosate + Mesotrione	31.5	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Saflufenacil	97.8	0.3	44.2	55.8	.	.	.	88.1	11.9	.	100.0
Sethoxydim	641.7	1.7	84.5	15.5	.	.	.	92.1	7.9	0.6	99.4
Sulfentrazone	421.4	1.1	98.8	1.2	.	.	.	84.4	15.6	1.2	98.8
Tembotrione	124.7	0.3	65.1	34.9	.	.	.	89.2	10.8	.	100.0
Thifensulfuron + Tribenuron	1757.1	4.7	100.0	.	.	.	.	86.4	13.6	0.1	99.9
Topramezone	0.2	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Tribenuron	184.4	0.5	100.0	.	.	.	.	94.1	5.9	.	100.0
Trifluralin	38.8	0.1	81.6	18.4	.	.	.	100.0	.	.	100.0
Trifluralin + Flumetsulam	23.7	0.1	100.0	.	.	.	.	.	100.0	.	100.0
Trifluralin + Imazethapyr	20.0	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Unknown herbicide	7749.4	20.7	62.7	35.4	2.0	.	.	76.2	23.8	3.0	97.0
Total	41108.9	109.9	71.1	27.2	1.6	0.0	0.2	83.7	16.3	2.1	97.9

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 percent of the planted acres.

Table 24. DESICCANT usage in North Dakota, 2012.¹

Desiccant	Acres Treated ²	Acres Treated	Applications					Operator/ Applicator		Method of Application	
			1x	2x	3x	4x	5x	Farm	Custom	Aerial	Ground
	1000	%	%	%	%	%	%	%	%	%	%
Diquat	1.2	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Unknown desiccant	1122.4	3.0	78.7	21.3	.	.	.	79.2	20.8	8.8	91.2
Total	1123.6	3.0	78.7	21.3	.	.	.	79.2	20.8	8.8	91.2

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 percent of the planted acres.

Table 25. INSECTICIDE usage in North Dakota, 2012.¹

	Acres	Acres	Applications					Operator/ Applicator		Method of Application	
	Treated ²	Treated	1x	2x	3x	4x	5x	Farm	Custom	Aerial	Ground
	1000	%	%	%	%	%	%	%	%	%	%
Insecticide											
Bifenthrin	117.2	0.3	53.4	46.6	.	.	.	100.0	.	.	100.0
Bifenthrin + Zeta-cypermethrin	40.1	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Carbaryl	7.0	0.0	100.0	.	.	.	.	42.1	57.9	57.9	42.1
Carbofuran	0.4	0.0	100.0	.	.	.	.	.	100.0	.	100.0
Chlorpyrifos	934.0	2.5	98.6	1.4	.	.	.	82.1	17.9	10.8	89.2
Chlorpyrifos + Gamma-cyhalothrin	9.8	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Clothianidin	8.5	0.0	100.0	.	.	.	.	36.8	63.2	.	100.0
Cyfluthrin	51.2	0.1	81.6	18.4	.	.	.	38.6	61.4	22.0	78.0
Esfenvalerate	261.5	0.7	89.6	10.4	.	.	.	82.0	18.0	16.2	83.8
Ethyl parathion	47.1	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Lambda-cyhalothrin	840.7	2.2	98.6	1.4	.	.	.	82.5	17.5	15.0	85.0
Malathion	0.9	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Mineral oil	15.3	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Permethrin	9.0	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Piperonyl butoxide + Pyrethrins	13.2	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Sodium dichloroisocyanurate dihydrate	0.4	0.0	100.0	.	.	.	.	.	100.0	.	100.0
Sulfur	50.9	0.1	100.0	.	.	.	.	85.9	14.1	.	100.0
Terbufos	20.3	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Thiamethoxam	0.8	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Thiamethoxam + Fludioxonil	1.0	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Trimethacarb	0.5	0.0	100.0	.	.	.	.	100.0	.	100.0	.
Unknown insecticide	1717.4	4.6	92.6	5.3	2.2	.	.	67.6	32.4	14.8	85.2
Total	4147.0	11.1	94.1	5.0	0.9	.	.	76.7	23.3	13.0	87.0

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 percent of the planted acres.

Table 26. FUNGICIDE usage in North Dakota, 2012.¹

Fungicide	Acres	Acres	Applications					Operator/ Applicator		Method of Application	
	Treated ² 1000	Treated %	1x %	2x %	3x %	4x %	5x %	Farm %	Custom %	Aerial %	Ground %
Boscalid	22.7	0.1	100.0	.	.	.	.	70.0	30.0	.	100.0
Captan + Lindane	5.3	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Carboxin	9.6	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Carboxin + Permethrin	13.7	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Carboxin + Thiram	18.1	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Copper hydroxide	6.8	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Difenoconazole	4.9	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Imazalil + Metalaxyl + Tebuconazole	3.9	0.0	100.0	.	.	.	.	100.0	.	100.0	.
Mefenoxam + Fludioxonil	0.9	0.0	100.0	.	.	.	.	.	100.0	.	100.0
Metalaxyl	11.8	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Metalaxyl + Tebuconazole	25.3	0.1	100.0	.	.	.	.	100.0	.	55.0	45.0
Propiconazole	1537.9	4.1	99.4	0.6	.	.	.	89.5	10.5	6.5	93.5
Propiconazole + Azoxystrobin	191.7	0.5	100.0	.	.	.	.	89.1	10.9	6.2	93.8
Propiconazole + Trifloxystrobin	176.1	0.5	100.0	.	.	.	.	62.3	37.7	8.5	91.5
Prothioconazole	343.9	0.9	94.8	5.2	.	.	.	94.3	5.7	9.3	90.7
Prothioconazole + Tebuconazole	866.6	2.3	100.0	.	.	.	.	79.1	20.9	14.0	86.0
Pyraclostrobin	2169.0	5.8	90.0	6.2	3.8	.	.	76.2	23.8	14.1	85.9
Sulfur	8.7	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Tebuconazole	631.8	1.7	94.3	5.7	.	.	.	73.4	26.6	23.0	77.0
Tetraconazole	14.4	0.0	100.0	.	.	.	.	82.2	17.8	17.8	82.2
Thiophanatel	196.0	0.5	47.8	52.2	.	.	.	58.6	41.4	2.2	97.8
Triphenyltin	55.5	0.1	100.0	.	.	.	.	77.8	22.2	22.2	77.8
Vinclozolin	19.5	0.1	100.0	.	.	.	.	79.7	20.3	20.3	79.7
Unknown fungicide	2107.7	5.6	98.4	1.6	.	.	.	74.3	25.7	12.4	87.6
Total	8442.0	22.6	95.1	3.9	1.0	.	.	78.9	21.1	12.2	87.8

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 percent of the planted acres.

Table 26. Percent of respondents answering “Yes” to pest management decisions and practices in North Dakota, 2012.

	Northwest	North Central	Northeast	West Central	Central	East Central	Southwest	South Central	Southeast	State Totals
Do you:	----- % -----									
Scout field regularly for pests?	58.2	61.2	57.8	57.8	57.6	64.4	54.5	53.3	61.2	58.5
Identify insects in field as beneficial or bad insects when scouting?	40.4	43.9	43.7	38.4	40.4	51.3	39.2	38.0	47.6	42.7
Make routine treatments for pests experienced the previous year?	22.9	20.5	19.8	19.0	17.1	23.7	15.8	20.8	17.2	19.7
Make treatments based on pest identity and economic thresholds?	52.2	46.5	49.5	47.3	48.2	61.9	45.0	46.7	52.1	49.9
Use university/Extension guidelines in making treatment decisions	41.4	41.0	40.5	40.5	43.7	48.7	35.1	36.1	37.2	40.4
Use tilling, chopping, mowing, burning of field edges, lanes, ditches, roadways or fence lines to manage pests in your fields?	34.7	32.4	41.0	30.8	39.6	46.2	31.1	34.5	40.1	36.9
Consider pest resistance when selecting varieties?	42.8	39.4	42.5	37.6	42.9	55.5	37.8	38.4	45.6	42.5
Alternate or combine pesticide modes of action pesticides to delay pest resistance?	45.8	37.8	43.5	35.4	40.8	53.0	32.0	35.7	43.4	41.1
Rotate crops to manage pests?	46.8	36.5	38.7	40.5	36.7	53.0	26.1	40.8	44.7	40.5
Use disease, insect or seed forecasting information available on the Internet or via toll-free phone lines?	21.2	19.2	17.6	16.5	19.2	27.5	11.3	10.2	16.2	17.7
Use Internet or electronic media for pest management decisions?	24.9	21.2	20.6	18.6	22.4	31.4	16.2	17.3	19.1	21.3
Employ a crop consultant to help manage pests?	25.6	21.5	23.1	20.7	25.7	36.4	17.6	23.1	28.2	24.6
Scout for resistant weeds?	46.1	51.0	51.3	47.3	52.2	61.0	49.1	45.5	56.6	51.1
Alternate your Bt trait (or protein) to prevent corn root worm resistance to one Bt trait in corn?	3.4	10.6	8.0	8.4	15.5	29.7	5.9	14.9	28.5	13.6
Observe pesticide safety for honeybees before spraying insecticides in fields?	43.1	42.3	38.4	41.8	42.4	51.3	43.2	42.0	45.3	43.0
Plant the required non-Bt refuge of corn?	5.7	9.9	10.6	9.7	20.4	36.0	5.9	19.2	36.2	16.8
Routinely read the pesticide label prior to application?	79.8	77.9	73.4	75.5	72.7	75.4	74.8	74.1	74.4	75.3

Table 27. Percent of respondents answering “Yes” to holding a valid North Dakota pesticide applicators certification, 2012.

	Northwest	North Central	Northeast	West Central	Central	East Central	Southwest	South Central	Southeast	State Totals
Do you hold a:	----- % -----									
Private pesticide applicators certification?	31.6	32.4	35.9	27.0	24.5	41.1	25.7	22.7	36.2	31.3
Commercial pesticide applicators certification?	4.7	4.8	5.5	4.2	5.7	9.7	2.3	5.5	5.8	5.4

Table 28. Percent of respondents who read pesticide labels prior to application, 2012.

	Northwest	North Central	Northeast	West Central	Central	East Central	Southwest	South Central	Southeast	State Totals
	----- % -----									
Do you routinely read the pesticide label prior to application?	79.8	77.9	73.4	75.5	72.7	75.4	74.8	74.1	74.4	75.3
If you do not read the label, why not:										
Label too long?	77.8	85.7	84.2	78.0	81.3	84.2	81.6	75.7	86.3	82.0
Label too complicated?	4.4	4.1	1.3	7.3	2.1	2.6	10.5	5.4	3.9	4.3
Label too difficult to find information?	13.3	6.1	10.5	7.3	10.4	7.9	5.3	13.5	5.9	9.0
Word size (font) on label too small?	4.4	4.1	3.9	7.3	6.3	5.3	2.6	5.4	3.9	4.7

Table 29. Percent of respondents indicating source of pesticide use information, 2012.

	Northwest	North Central	Northeast	West Central	Central	East Central	Southwest	South Central	Southeast	State Totals
Where do you get your information on pesticide use?	----- % -----									
Local dealer	75.3	74.8	78.7	72.1	78.2	74.2	81.6	74.5	77.1	76.3
NDSU Extension Service	7.6	8.2	7.6	12.4	10.5	7.1	7.8	9.4	5.2	8.3
Pesticide label	15.3	15.3	12.4	13.3	9.6	15.6	8.7	15.7	16.3	13.7
North Dakota Department of Agriculture	1.7	1.7	1.3	2.2	1.7	3.1	1.9	0.4	1.4	1.7

2012 PESTICIDE USE AND PEST MANAGEMENT PRACTICES STUDY

January 28, 2013

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.

The North Dakota State University Extension Service funds this survey to provide a profile of pesticide use and pest management practices at state and district levels for North Dakota.

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

Regarding the interview, per Title 7 of the U.S. Code and CIPSEA (Public Law 107-347), individual reports are kept confidential and used only for statistical purposes in combination with other reports from other producers to determine averages. Response is voluntary and not required by law.

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 in the fall of 2013 through NDSU and your local extension agent.

Thank you in advance for your time and cooperation.

Sincerely,



Chris Boerboom, Director
North Dakota State University
Extension Service



NORTH DAKOTA PESTICIDE USE SURVEY INSTRUMENT FOR 2012 CROPPING YEAR



North Dakota Field Office
P.O. Box 3166
Fargo, ND 58108-3166
701-239-5306
Fax: 701-239-5613
nass-nd@nass.usda.gov

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>							
2012 Crop	Total Acres Planted	Acres Planted with Treated Seed <i>(Exclude Inoculants)</i>		Number of Acres Treated for Each of the Following: <i>(Include 2011 applications for 2012 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
SUGARBEETS	1101	1102	1103	1104	1105	1106	1107
DRY EDIBLE BEANS <i>(Include Chickpeas/Garbanzos)</i>	1111	1112	1113	1114	1115	1116	1117
CANOLA	1121	1122	1123	1124	1125	1126	1127
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 2012	1501						

II. FARM TREATED SEED - for 2012 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	FIELD PEA SEED			
	2111	2112	2113		2701	2702	2703
	2121	2122	2123		2711	2712	2713
OAT SEED					2721	2722	2723
	2201	2202	2203	OTHER SEED			
	2211	2212	2213		2801	2802	2803
FLAX SEED					2811	2812	2813
	2301	2302	2303				
	2311	2312	2313				
	2321	2322	2323				

III. USAGE OF INDIVIDUAL PESTICIDES ON 2012 CROPS - Include applications after September 1, 2011 on crops for 2012 harvest. (Please report below the acres treated with each individual chemical during 2012 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	Appli-cator		Method	NAME OF PESTICIDE USED (Please list chemicals used. Refer to the enclosed list)	Office Use	Acres Treated	No. of Applications	Appli-cator		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 (Include Chickpeas/Garbanzos)					
	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 2012 CROPS - CONTINUED

NAME OF PESTICIDE USED (Please list chemicals used. Refer to the enclosed list)	Office Use	Acres Treated	No. of Applications	Appli-cator		Method	NAME OF PESTICIDE USED (Please list chemicals used. Refer to the enclosed list)	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	
CANOLA						SUGARBEETS							
	4001	4002	4003	4004	4005		3901	3902	3903	3904	3905		
	4011	4012	4013	4014	4015		3911	3912	3913	3914	3915		
	4021	4022	4023	4024	4025		3921	3922	3923	3924	3925		
	4031	4032	4033	4034	4035		3931	3932	3933	3934	3935		
	4041	4042	4043	4044	4045		3941	3942	3943	3944	3945		
	4051	4052	4053	4054	4055		3951	3952	3953	3954	3955		
	4061	4062	4063	4064	4065		3961	3962	3963	3964	3965		
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. Your pest management decisions and practices

Yes = 1 No = 3

<i>Do you . . .</i>	<i>answer Yes or No for each question</i>	
• scout fields regularly for pests?		6301
• identify insects in field as beneficial or bad insects when scouting?		
• make routine treatments for pests you experienced the previous year?		6302
• make treatments based on pest identification and economic thresholds?		
• 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 or combine pesticide modes of action to prevent 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 or electronic media to find information necessary for pest management decisions?		6310
• employ the services of a crop consultant to help manage pests?		6311
• scout for resistant weeds?		
• alternate your Bt trait (or protein) to prevent corn rootworm from developing resistance to one Bt trait in corn?		
• observe pesticide safety for honey bees before spraying insecticides in fields?		
• plant the required non-Bt refuge of corn?		
• routinely read the pesticide label prior to application?		

V. Certification

Yes = 1 No = 3

<i>Do you . . .</i>	<i>answer Yes or No for each question</i>	
• currently hold a valid Commercial Pesticide Applicators Certification?		
• currently hold a valid Private Pesticide Applicators Certification?		

VI. Pesticide Use

1. Do you routinely read the pesticide label prior to application? Yes = 1 No = 3
 - a. If you do not read the label, why not?

Too long = 1; Too complicated = 2; Too difficult to find information = 3; Word size (font) is too small = 4
2. Where do you get your information on pesticide use?

Local dealer = 1; NDSU Extension = 2; Pesticide label = 3; Other = 4

This completes the questionnaire. Thank you for your cooperation.

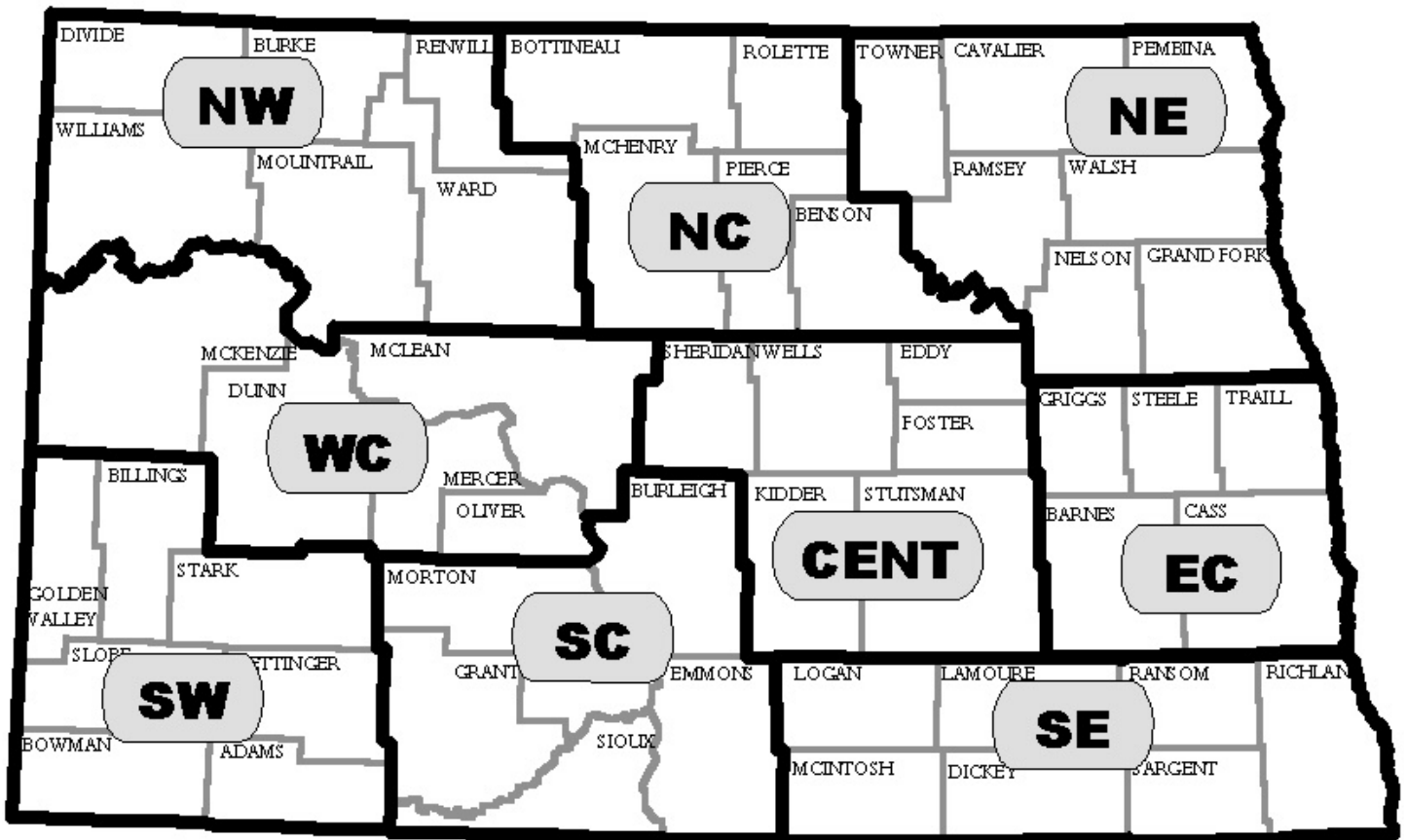
Reported by: _____ Date: _____

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



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