

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

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

¹ Pesticides applied as a tank-mixture were considered separately unless a commercial premix was used. . = no data reported.² Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

¹ . = no data reported.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

¹ . = no data reported

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

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

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

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

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

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

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

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

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

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

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

¹ . = no data reported.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Table 31. HERBICIDE usage in North Dakota, 2008.¹

Herbicide	Acres treated ² 1000	Acres treated %	Applications					Operator/ Applicator		Method of Application	
			1x %	2x %	3x %	4x %	5x %	Farm %	Custom %	Aerial %	Ground %
2,4-D	1861.5	4.8	96.7	1.0	2.3	.	.	90.2	9.8	2.7	97.3
2,4-D-beester	16.9	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Acetochlor	68.3	0.2	100.0	.	.	.	.	53.7	46.3	1.9	98.1
Acetochlor + Atrazine	17.3	0.0	100.0	.	.	.	.	67.7	32.3	.	100.0
Acetochlor + Dichlormid + Atrazine	57.9	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Alachlor	9.3	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Aminopyralid	79.7	0.2	99.8	0.2	.	.	.	49.0	51.0	6.4	93.6
Aminopyralid + 2,4-D	9.6	0.0	100.0	.	.	.	.	43.9	56.1	44.7	55.3
Atrazine	59.5	0.2	100.0	.	.	.	.	66.7	33.3	.	100.0
Atrazine + Glufosinate-ammonium	16.8	0.0	100.0	.	.	.	.	58.0	42.0	.	100.0
Bentazon	779.2	2.0	67.3	32.7	.	.	.	91.1	8.9	.	100.0
Bentazon + Sethoxydim	77.3	0.2	62.7	37.3	.	.	.	92.4	7.6	10.9	89.1
Bromoxynil + Pyrasulfotole + Mefenpyr	834.4	2.1	100.0	.	.	.	.	87.4	12.6	0.7	99.3
Bromoxynil	50.0	0.1	94.8	5.2	.	.	.	88.1	11.9	16.6	83.4
Bromoxynil + 2,4-D	88.0	0.2	100.0	.	.	.	.	90.7	9.3	0.6	99.4
Bromoxynil + Fluroxypyr	14.3	0.0	100.0	.	.	.	.	41.4	58.6	.	100.0
Bromoxynil + MCPA	2501.0	6.4	99.9	0.1	.	.	.	86.7	13.3	3.9	96.1
Carfentrazone-ethyl	65.0	0.2	100.0	.	.	.	.	75.0	25.0	.	100.0
Clethodim	937.4	2.4	90.2	4.9	4.7	0.1	.	87.2	12.8	3.3	96.7
Clodinafop-propargyl	902.4	2.3	100.0	.	.	.	.	95.6	4.4	5.2	94.8
Clopyralid	111.6	0.3	37.5	4.7	34.9	.	22.9	69.4	30.6	26.3	73.7
Clopyralid + 2,4-D	70.9	0.2	99.4	0.0	0.6	.	.	68.7	31.3	33.6	66.4
Clopyralid + Fluroxypyr	3742.4	9.6	99.7	0.3	.	.	.	91.6	8.4	1.2	98.8
Clopyralid + MCPA	12.3	0.0	100.0	.	.	.	.	73.8	26.2	.	100.0
Cloransulam-methyl	19.9	0.1	100.0	.	.	.	.	50.0	50.0	.	100.0
Desmedipham	10.1	0.0	59.1	6.7	34.2	.	.	100.0	.	.	100.0
Desmedipham + Phenmedipham	85.6	0.2	15.9	27.4	55.2	1.5	.	95.6	4.4	4.4	95.6
Desmedipham + Phenmedipham + Ethofumesate	86.9	0.2	27.8	17.5	20.6	4.7	29.4	63.9	36.1	36.1	63.9
Dicamba	591.6	1.5	91.3	8.0	0.2	0.5	.	90.6	9.4	2.0	98.0
Dicamba + 2,4-D	99.0	0.3	71.0	29.0	.	.	.	93.8	6.2	.	100.0
Dicamba + Nicosulfuron	7.0	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Diflufenzopyr-sodium + Dicamba	279.6	0.7	64.9	2.4	.	33	.	89.5	10.5	.	100.0
Dimethenamid-P	145.4	0.4	64.0	36.0	.	.	.	88.8	11.2	.	100.0
Ethalfuralin	166.8	0.4	100.0	.	.	.	.	78.6	21.4	7.9	92.1
Ethofumesate	27.7	0.1	17.7	27.5	35.4	19	.	100.0	.	.	100.0
Fenoxaprop + Pyrasulfotole + Bromoxynil + Mefenpyr	49.8	0.1	100.0	.	.	.	.	90.0	10.0	1.6	98.4
Fenoxaprop + Bromoxynil + MCPA	6.4	.	100.0	.	.	.	.	100.0	.	.	100.0
Fenoxaprop-P	3461.4	8.9	98.2	1.2	0.6	.	.	86.6	13.4	0.5	99.5
Flucarbazone sodium	970.8	2.5	100.0	.	.	.	.	91.9	8.1	2.2	97.8
Flumiclorac	24.7	0.1	100.0	.	.	.	.	66.5	33.5	10.0	90.0
Flumioxazin	132.5	0.3	100.0	.	.	.	.	61.9	38.1	7.1	92.9
Fluroxypyr	263.4	0.7	99.2	0.8	.	.	.	95.4	4.6	.	100.0
Fluroxypyr + 2,4-D	45.7	0.7	100.0	.	.	.	.	37.6	62.4	.	100.0
Fluroxypyr + MCPA	87.8	0.2	100.0	.	.	.	.	69.3	30.7	0.1	99.9
Fomesafen	145.7	0.4	70.2	29.8	.	.	.	77.1	22.9	.	100.0
Foramsulfuron	14.8	0.0	100.0	.	.	.	.	64.3	35.7	.	100.0
Glufosinate-ammonium	389.9	1.0	92.8	7.2	.	.	.	89.1	10.9	1.8	98.2
Glyphosate	12042.7	31.0	40.2	55.9	3.9	0.0	.	85.4	14.6	1.9	98.1
Glyphosate + 2,4-D	10.9	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Glyphosate + Dicamba	10.5	0.0	100.0	.	.	.	.	100.0	.	.	100.0
Glyphosate + Sulfentrazone	25.3	0.1	100.0	.	.	.	.	100.0	.	.	100.0
Halosulfuron	12.3	0.0	100.0	.	.	.	.	76.7	23.3	3.6	96.4
Imazamethabenz	85.5	0.2	97.1	2.9	.	.	.	86.3	13.7	.	100.0
Imazamox	786.7	2.0	82.9	17.1	.	.	.	88.6	11.4	3.2	96.8

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

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

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

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

Table 32. DESICCANT usage in North Dakota, 2008.¹

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

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

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

Table 33. INSECTICIDE usage in North Dakota, 2008.¹

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

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

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

Table 34. FUNGICIDE usage in North Dakota, 2008.¹

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

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

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

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

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