

TABLE 19. SUMMER FALLOW: Herbicide, Insecticide, Fungicide and Desiccant usage and application method. North Dakota, 1992.

	Acres treated ²	Acres treated	Applications				Applicator		Method of application	
			1	2	3	4	Farm operator	Custom	Aerial	Ground
Herbicide ¹	(1000)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
2,4-D	479.1	11.7	76.9	21.8	1.3	.	95.9	4.1	1.0	99.0
Bromoxynil + MCPA	0.9	0.0	100.0	.	.	.	100.0	.	.	100.0
Clopyralid + 2,4-D	4.1	0.1	100.0	.	.	.	91.8	8.2	.	100.0
Dicamba	285.7	7.0	76.7	22.1	1.2	.	96.6	3.4	2.6	97.4
Glyphosate	491.8	12.0	66.6	31.1	2.3	.	96.3	3.7	0.4	99.6
Glyphosate + 2,4-D	55.4	1.4	78.6	21.4	.	.	79.9	20.1	0.7	99.3
Glyphosate + dicamba	166.9	4.1	49.3	49.5	1.2	.	95.7	4.3	1.5	98.5
Imazamethabenz	0.2	0.0	100.0	.	.	.	100.0	.	.	100.0
MCPA	21.5	0.5	63.0	37.0	.	.	100.0	.	.	100.0
Metsulfuron	3.2	0.1	100.0	.	.	.	100.0	.	90.3	9.7
Picloram	10.4	0.3	59.4	40.6	.	.	86.5	13.5	.	100.0
Thifensulfuron + tribenuron	0.9	0.0	100.0	.	.	.	81.5	18.5	18.5	81.5
Triallate	11.8	0.3	100.0	.	.	.	97.8	2.2	.	100.0
Triallate + trifluralin	2.8	0.1	100.0	.	.	.	100.0	.	37.6	62.4
Tribenuron	0.2	0.0	100.0	.	.	.	100.0	.	.	100.0
Trifluralin	95.7	2.3	75.7	24.3	.	.	96.3	3.7	1.1	98.9
Trifluralin + clomazone	4.0	0.1	100.0	.	.	.	100.0	.	.	100.0
All Herbicides	1634.8	39.9	71.0	27.6	1.4	.	95.6	4.4	1.4	98.6
Insecticide										
Carbaryl	0.2	0.0	100.0	.	.	.	100.0	.	.	100.0
All Insecticides	0.2	0.0	100.0	.	.	.	100.0	.	.	100.0
Fungicide										
Chlorothalonil	0.7	0.0	100.0	.	.	.	100.0	.	.	100.0
All Fungicides	0.7	0.0	100.0	.	.	.	100.0	.	.	100.0
Desiccant										
Endothall	0.3	0.0	.	100.0	.	.	100.0	.	.	100.0
All Desiccants	0.3	0.0	.	100.0	.	.	100.0	.	.	100.0

¹Herbicides applied as a tank mixture were considered separately unless a commercial premix was used.

²Multiple applications to the same acreage were totaled as separate values. Thus, acres treated can exceed 100% of planted acres.

TABLE 20. CRP: Herbicide, Insecticide, Fungicide and Desiccant usage and application method. North Dakota, 1992.

	Acres treated ²	Acres treated	Applications				Applicator		Method of application	
			1	2	3	4	Farm operator	Custom	Aerial	Ground
Herbicide ¹	(1000)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
2,4-D	65.3	2.3	97.2	2.8	.	.	60.5	39.5	14.6	85.4
Dicamba	36.0	1.2	97.3	2.7	.	.	46.4	53.6	4.6	95.4
Glyphosate	0.9	0.0	80.4	19.6	.	.	80.4	19.6	.	100.0
MCPA	6.2	0.2	93.5	6.5	.	.	100.0	.	.	100.0
Metsulfuron	2.8	0.1	100.0	.	.	.	100.0	.	.	100.0
Picloram	20.2	0.7	66.8	.	33.2	.	94.3	5.7	1.1	98.9
All Herbicides	131.5	4.5	92.3	2.6	5.1	.	64.7	35.3	8.7	91.3
Insecticide										
Acephate	1.3	0.0	.	100.0	.	.	100.0	.	.	100.0
Carbaryl	13.1	0.5	100.0	.	.	.	76.0	24.0	1.7	98.3
Carbofuran	3.4	0.1	11.9	88.1	.	.	11.9	88.1	88.1	11.9
Chlorpyrifos	1.3	0.0	100.0	.	.	.	.	100.0	100.0	.
Esfenvalerate	1.3	0.0	100.0	.	.	.	18.9	81.1	81.1	18.9
Ethyl parathion	0.1	0.0	100.0	.	.	.	.	100.0	100.0	.
Malathion	0.4	0.0	100.0	.	.	.	100.0	.	.	100.0
All Insecticides	20.9	0.7	79.6	20.4	.	.	58.9	41.1	27.1	72.9

¹Herbicides applied as a tank mixture were considered separately unless a commercial premix was used.

²Multiple applications to the same acreage were totaled as separate values. Thus, acres treated can exceed 100% of planted acres.

TABLE 21A. HERBICIDE Usage in North Dakota, 1992.

Herbicide	Acres treated (1000)	Acres treated (%)	Applications				Applicator		Method of application	
			1	2	3	4	Farm operator	Custom	Aerial	Ground
			(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
2,4-D	8187.1	20.8	98.4	1.5	0.1	.	89.1	10.9	6.9	93.1
Acifluorfen	64.6	0.2	94.2	5.8	.	.	94.8	5.2	2.5	97.5
Acifluorfen + bentazon	50.3	0.1	100.0	.	.	.	95.1	4.9	4.9	95.1
Alachlor	113.1	0.3	100.0	.	.	.	85.4	14.6	.	100.0
Alachlor + trifluralin	11.5	0.0	100.0	.	.	.	100.0	.	.	100.0
Ametryn	2.0	0.0	100.0	.	.	.	100.0	.	.	100.0
Amitrole	0.2	0.0	100.0	.	.	.	100.0	.	.	100.0
Atrazine	19.3	0.0	100.0	.	.	.	76.5	23.5	0.8	99.2
Atrazine + metolachlor	7.5	0.0	100.0	.	.	.	100.0	.	.	100.0
Barban	26.4	0.1	100.0	.	.	.	59.6	40.4	38.7	61.3
Bentazon	445.8	1.1	90.0	9.7	0.3	.	88.6	11.4	10.9	89.1
Bentazon + atrazine	2.7	0.0	100.0	.	.	.	100.0	.	.	100.0
Bromoxynil	396.2	1.0	97.6	2.4	.	.	89.3	10.7	5.3	94.7
Bromoxynil + MCPA	713.1	1.8	100.0	.	.	.	89.0	11.0	9.1	90.9
Butylate + safener	0.7	0.0	100.0	.	.	.	.	100.0	.	100.0
Chloramben	11.4	0.0	100.0	.	.	.	100.0	.	.	100.0
Chlorimuron	2.1	0.0	100.0	.	.	.	100.0	.	.	100.0
Chlorsulfuron	0.8	0.0	100.0	.	.	.	100.0	.	.	100.0
Clopyralid	41.7	0.1	48.1	20.2	31.7	.	98.5	1.5	1.4	98.6
Clopyralid + 2,4-D	21.7	0.1	100.0	.	.	.	93.2	6.8	9.8	90.2
Cyanazine	113.5	0.3	100.0	.	.	.	76.2	23.8	1.8	98.2
Cycloate	16.1	0.0	100.0	.	.	.	85.7	14.3	.	100.0
Desmedipham	154.2	0.4	47.9	34.6	11.9	5.6	94.8	5.2	6.1	93.9
Desmedipham + phenmedipham	205.4	0.5	38.0	40.5	16.3	5.1	94.9	5.1	4.3	95.7
Dicamba	3803.0	9.7	97.9	2.0	0.1	.	89.6	10.4	4.9	95.1
Diclofop	416.7	1.1	100.0	.	.	.	83.2	16.8	12.0	88.0
Diethatyl	11.9	0.0	100.0	.	.	.	100.0	.	.	100.0
Difenzoquat	84.0	0.2	100.0	.	.	.	85.5	14.5	6.6	93.4
Endothall	3.3	0.0	63.7	36.3	.	.	100.0	.	.	100.0
EPTC	22.7	0.1	81.1	18.9	.	.	81.5	18.5	.	100.0
EPTC + safener	230.1	0.6	100.0	.	.	.	75.2	24.8	1.4	98.6
EPTC + safener + extender	6.6	0.0	100.0	.	.	.	62.0	38.0	.	100.0
Ethalfluralin	946.9	2.4	99.3	0.7	.	.	85.9	14.1	3.5	96.5
Ethofumesate	15.7	0.0	100.0	.	.	.	100.0	.	.	100.0
Fenoxaprop	10.4	0.0	79.7	20.3	.	.	79.7	20.3	.	100.0
Fenoxaprop + 2,4-D + MCPA	548.8	1.4	100.0	.	.	.	83.0	17.0	13.4	86.6
Fenoxaprop + MCPA	264.6	0.7	98.8	1.2	.	.	90.4	9.6	4.9	95.1
Fenoxaprop + MCPA + thifensulfuron	193.7	0.5	100.0	.	.	.	94.6	5.4	1.5	98.5
Fluazifop-P	4.6	0.0	100.0	.	.	.	89.6	10.4	2.9	97.1
Fluazifop-P + fenoxaprop	11.1	0.0	100.0	.	.	.	82.8	17.2	.	100.0
Glyphosate	572.2	1.5	70.8	27.2	2.0	.	95.0	5.0	1.5	98.5
Glyphosate + 2,4-D	56.1	0.1	78.8	21.2	.	.	79.0	21.0	0.6	99.4
Glyphosate + dicamba	169.0	0.4	49.9	48.9	1.2	.	95.7	4.3	1.5	98.5
Imazamethabenz	234.7	0.6	96.8	3.2	.	.	86.2	13.8	8.5	91.5
Imazethapyr	60.8	0.2	100.0	.	.	.	78.5	21.5	18.6	81.4
Lactofen	31.7	0.1	93.5	6.5	.	.	77.0	23.0	23.0	77.0
Linuron	0.2	0.0	100.0	.	.	.	100.0	.	.	100.0

TABLE 21A. (continued)

Herbicide	Acres treated (1000)	Acres treated (%)	Applications				Applicator		Method of application	
			1	2	3	4	Farm operator	Custom	Aerial	Ground
			(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
MCPA	3048.8	7.8	99.3	0.7	.	.	91.7	8.3	4.7	95.3
Metolachlor	98.0	0.2	100.0	.	.	.	91.9	8.1	2.5	97.5
etolachlor + cyanazine	2.3	0.0	100.0	.	.	.	100.0	.	.	100.0
Metribuzin	20.7	0.1	100.0	.	.	.	66.1	33.9	0.8	99.2
Metsulfuron	465.1	1.2	100.0	.	.	.	93.4	6.6	5.5	94.5
Naptalam+2,4-D	0.6	0.0	100.0	.	.	.	.	100.0	100.0	.
Nicosulfuron	252.6	0.6	99.2	0.8	.	.	91.9	8.1	3.6	96.4
Paraquat	3.6	0.0	100.0	.	.	.	79.7	20.3	.	100.0
Pendimethalin	61.7	0.2	100.0	.	.	.	63.9	36.1	3.8	96.2
Picloram	198.5	0.5	87.5	7.5	5.0	.	81.0	19.0	10.7	89.3
Propachlor	3.5	0.0	100.0	.	.	.	100.0	.	.	100.0
Propanil + MCPA	1.6	0.0	100.0	.	.	.	100.0	.	.	100.0
Pyramin	0.5	0.0	100.0	.	.	.	100.0	.	.	100.0
Quizalofop-P	5.8	0.0	100.0	.	.	.	97.0	3.0	.	100.0
Sethoxydim	315.4	0.8	85.5	13.1	1.4	.	89.3	10.7	8.9	91.1
Thifensulfuron	62.2	0.2	93.4	6.6	.	.	84.7	15.3	11.2	88.8
Thifensulfuron + tribenuron	1139.4	2.9	99.9	0.1	.	.	91.1	8.9	8.9	91.1
Triallate	410.6	1.0	100.0	.	.	.	87.4	12.6	0.3	99.7
Triallate + trifluralin	115.6	0.3	100.0	.	.	.	86.1	13.9	4.1	95.9
Triasulfuron	28.9	0.1	100.0	.	.	.	48.2	51.8	51.8	48.2
Tribenuron	1370.0	3.5	99.8	0.2	.	.	90.8	9.2	5.6	94.4
Trifluralin	2862.0	7.3	98.6	1.4	.	.	94.2	5.8	2.1	97.9
Trifluralin + clomazone	4.0	0.0	100.0	.	.	.	100.0	.	.	100.0
Total	28777.4	73.2	96.8	2.8	0.4	0.1	89.7	10.3	5.7	94.3

TABLE 21B. HERBICIDE Usage in North Dakota, 1989¹.

Herbicide	Acres treated (1000)	Acres treated (%)	Applications				Applicator		Method of application	
			1	2	3	4	Farm operator	Custom	Aerial	Ground
			(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
2,4-D	754.7	1.9	98.1	1.7	0.2	.	85.4	14.6	15.9	84.1
2,4-D amine	4414.0	11.2	99.7	0.3	.	.	87.9	12.1	6.8	93.2
2,4-D ester	2500.3	6.4	98.7	1.2	0.1	.	89.0	11.0	7.6	92.4
Acifluorfen	110.6	0.3	93.1	6.9	.	.	92.8	7.2	7.8	92.2
Acifluorfen + bentazon	1.2	0.0	100.0	.	.	.	.	100.0	.	100.0
Alachlor	87.6	0.2	100.0	.	.	.	74.9	25.1	.	100.0
Amitrole	5.8	0.0	87.0	0.8	.	12.2	100.0	.	.	100.0
Atrazine	60.3	0.2	100.0	.	.	.	76.9	23.1	3.7	96.3
Atrazine + metolachlor	13.0	0.0	100.0	.	.	.	100.0	.	.	100.0
Barban	60.3	0.2	100.0	.	.	.	54.8	54.2	42.3	57.7
Benefin	3.2	0.0	100.0	.	.	.	100.0	.	.	100.0
Bentazon	411.4	1.0	94.3	5.7	.	.	92.4	7.6	6.3	93.7
Bromoxynil	160.5	0.4	98.6	1.4	.	.	89.1	10.9	4.1	95.9
Bromoxynil + MCPA	465.2	1.2	98.1	1.9	.	.	90.1	9.9	7.1	92.9
Butylate + safener	4.9	0.0	100.0	.	.	.	100.0	.	.	100.0
Butylate + safener + atrazine	4.9	0.0	100.0	.	.	.	100.0	.	.	100.0
Chloramben	30.0	0.1	100.0	.	.	.	66.1	33.9	.	100.0
Chlorsulfuron	426.8	1.1	100.0	.	.	.	83.1	16.9	8.6	91.4
Clopyralid	12.7	0.0	100.0	.	.	.	98.2	1.8	3.5	96.5
Clopyralid + 2,4-D	115.6	0.3	99.8	0.2	.	.	85.8	14.2	6.9	93.1
Cyanazine	188.8	0.5	100.0	.	.	.	77.9	22.1	0.7	99.3
Cyanazine + atrazine	15.5	0.0	100.0	.	.	.	61.5	38.5	38.5	61.5
Cycloate	32.3	0.1	100.0	.	.	.	88.6	11.4	28.5	71.5
Desmedipham	97.9	0.2	44.3	30.5	9.8	15.4	100.0	.	17.2	82.8
Desmedipham + phenmedipham	199.6	0.5	22.9	56.9	4.9	15.3	99.6	0.4	.	100.0
Diallate	9.1	0.0	100.0	.	.	.	84.4	15.6	.	100.0
Dicamba	3061.6	7.8	98.9	0.6	0.5	.	88.7	11.3	6.3	93.7
Dicamba + 2,4-D	7.1	0.0	60.8	39.2	.	.	60.8	39.2	.	100.0
Dicamba + atrazine	16.2	0.0	100.0	.	.	.	64.2	35.8	4.8	95.2
Diclofop	813.1	2.1	99.4	0.6	.	.	76.0	24.0	21.4	78.6
Diclofop + bromoxynil + MCPA	20.1	0.1	100.0	.	.	.	62.2	37.8	36.0	64.0
Diethylatyl	23.1	0.1	100.0	.	.	.	89.3	10.7	.	100.0
Difenzoquat	103.1	0.3	100.0	.	.	.	90.5	9.5	6.3	93.7
Diquat	2.2	0.0	100.0	.	.	.	100.0	.	.	100.0
Endothall	19.0	0.0	59.2	40.8	.	.	100.0	.	.	100.0
EPTC	55.5	0.1	100.0	.	.	.	89.1	10.9	.	100.0
EPTC + safener	290.2	0.7	99.4	0.6	.	.	83.7	16.3	2.0	98.0
EPTC + safener + extender	4.1	0.0	100.0	.	.	.	56.0	44.0	.	100.0
Ethalfuralin	725.0	1.8	99.7	0.3	.	.	87.4	12.6	3.9	96.1
Ethofumesate	3.3	0.0	100.0	.	.	.	100.0	.	.	100.0
Fenoxaprop	1.6	0.0	100.0	.	.	.	100.0	.	.	100.0
Fenoxaprop + MCPA + 2,4-D	147.7	0.4	98.5	1.5	.	.	78.4	21.6	4.2	95.8
Fluazifop-P	6.0	0.0	100.0	.	.	.	100.0	.	.	100.0
Glyphosate	139.4	0.4	81.9	17.0	1.1	.	86.2	13.8	7.1	92.9
Glyphosate + 2,4-D	168.1	0.4	81.9	12.2	5.9	.	97.3	2.7	0.3	99.7
Glyphosate + dicamba	98.4	0.3	78.8	16.0	5.2	.	87.5	12.5	3.1	96.9

TABLE 21B. (continued)¹.

	Acres treated	Acres treated	Applications				Applicator		Method of application	
			1	2	3	4	Farm operator	Custom	Aerial	Ground
Herbicide	(1000)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Imazamethabenz	91.5	0.2	100.0	.	.	.	85.7	14.3	13.5	86.5
Imazethapyr	0.2	0.0	100.0	.	.	.	100.0	.	.	100.0
Lactofen	1.3	0.0	100.0	.	.	.	100.0	.	.	100.0
MCPA	143.5	0.4	100.0	.	.	.	91.2	8.8	5.9	94.1
MCPA + dicamba	1.1	0.0	100.0	.	.	.	100.0	.	.	100.0
MCPA amine	2563.9	6.5	99.8	0.2	.	.	89.6	10.4	9.0	91.0
MCPA ester	1019.2	2.6	100.0	0.0	.	.	91.7	8.3	4.2	95.8
Metolachlor	41.9	0.1	100.0	.	.	.	87.4	12.6	.	100.0
Metribuzin	32.7	0.1	94.8	5.2	.	.	94.3	5.7	.	100.0
Metsulfuron	1189.8	3.0	100.0	.	.	.	89.4	10.6	11.6	88.4
Paraquat	10.2	0.0	69.9	30.1	.	.	100.0	.	6.1	93.9
Pendimethalin	78.5	0.2	100.0	.	.	.	65.9	34.1	0.6	99.4
Picloram	180.4	0.5	88.7	9.6	1.8	.	81.6	18.4	14.0	85.9
Propachlor	3.1	0.0	100.0	.	.	.	100.0	.	85.9	14.1
Propanil + MCPA	23.5	0.1	100.0	.	.	.	83.8	16.2	9.0	91.0
Quizalofop-P	3.7	0.0	74.2	25.8	.	.	100.0	.	.	100.0
Sethoxydim	189.8	0.5	85.4	11.0	3.6	.	91.3	8.7	7.7	92.3
Thifensulfuron	1354.5	3.4	99.2	0.8	.	.	88.4	11.6	14.2	85.8
Triallate	763.4	1.9	100.0	.	.	.	90.1	9.9	2.9	97.1
Triallate + trifluralin	258.8	0.7	100.0	.	.	.	91.8	8.2	1.3	98.7
Tridiphane	8.3	0.0	100.0	.	.	.	98.0	2.0	.	100.0
Trifluralin	3808.9	9.7	99.5	0.4	0.1	0.0	94.6	5.4	2.5	97.5
Trifluralin + alachlor	8.9	0.0	100.0	.	.	.	100.0	.	100.0	.
Total	27674.7	70.4	98.0	1.5	0.3	0.2	88.9	11.1	7.3	92.7

¹McMullen, M.P., A.G. Dexter, J.D. Nalewaja, and G. Dahl. 1990. 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 No. 1.

Table 21C. Herbicide usage in North Dakota, 1984¹.

Herbicide	Acres treated (1000)	Acres treated (%)	Applicator		Method of application	
			Farm operator (%)	Custom (%)	Aerial (%)	Ground (%)
Acifluorfen	102.6	0.2	85.9	14.1	15.5	84.5
Alachlor	188.1	0.5	88.1	11.9	7.8	92.2
Amitrole	0.6	0.0	100.0	0.0	0.0	100.0
Imazamethabenz	1.1	0.0	15.4	84.6	0.0	100.0
Asulam	0.7	0.0	0.0	100.0	0.0	100.0
Atrazine + metolachlor	10.0	0.0	88.4	11.6	0.0	100.0
Barban	182.7	0.4	77.7	22.3	19.5	80.5
Bentazon	368.1	0.9	83.9	16.1	17.6	82.4
Bromoxynil	222.2	0.5	88.1	11.9	11.3	88.7
Bromoxynil + MCPA	710.8	1.7	83.6	16.4	17.2	82.8
Butylate + safener	26.7	0.0	96.7	3.3	1.0	99.0
Chloramben	53.5	0.1	74.8	25.2	26.4	73.6
Chlorsulfuron	281.3	0.7	70.0	30.0	21.0	79.0
Cycloate	14.8	0.0	82.7	17.3	0.0	100.0
Cyanazine	214.1	0.5	80.4	19.6	13.0	87.0
Dalapon	42.1	0.0	94.5	5.5	3.9	96.1
Desmedipham	17.9	0.0	100.0	0.0	7.7	92.3
Desmedipham + phenmedipham	72.2	0.2	95.2	4.8	8.3	91.7
Diallate	136.8	0.3	83.7	16.3	5.3	94.7
Dicamba	1469.4	3.6	88.3	11.7	6.3	93.7
Diclofop	655.7	1.6	81.0	19.0	15.2	84.8
Diethatyl	13.5	0.0	100.0	0.0	0.0	100.0
Difenzoquat	245.1	0.6	84.1	15.9	12.9	87.1
Dinoseb	2.8	0.0	74.3	25.7	25.7	74.3
Dinoseb amine salt	1.3	0.0	24.2	75.8	75.8	24.2
Endothall	9.4	0.0	95.3	4.7	4.7	95.3
EPTC	175.1	0.4	90.5	9.5	4.3	95.7
EPTC + safener	232.5	0.6	90.0	10.0	4.8	95.2
Ethofumesate	8.9	0.0	100.0	0.0	0.0	100.0
Ethalfuralin	153.6	0.4	88.1	11.9	3.1	96.9
Fluazifop	25.5	0.0	77.6	22.4	14.9	85.1
Fluchloralin	1.4	0.0	0.0	100.0	0.0	100.0
Glyphosate	880.3	2.2	86.1	13.9	6.0	94.0
Linuron	2.4	0.0	100.0	0.0	0.0	100.0
MCPA	222.2	0.5	85.8	14.2	16.0	84.0
MCPA amine	1326.8	3.2	81.7	18.3	14.6	85.4
MCPA ester	512.4	1.3	90.9	9.1	7.5	92.5
Metolachlor	29.0	0.0	82.0	18.0	7.5	92.5
Metribuzin	158.7	0.4	88.9	11.1	4.2	95.8
Naptalam + dinoseb	9.2	0.0	92.1	7.9	7.9	92.1
Naptalam + 2,4-DB	2.5	0.0	65.8	34.2	56.0	44.0
Pendimethalin	233.3	0.6	89.4	10.6	5.5	94.5
Picloram	258.5	0.6	78.0	22.0	11.1	88.9
Prometone	0.8	0.0	0.0	100.0	100.0	0.0
Propachlor	0.3	0.0	10.0	0.0	0.0	100.0
Propanil	15.7	0.0	90.7	9.3	0.0	100.0
Propham	0.1	0.0	100.0	0.0	0.0	100.0
Pyrazon	4.0	0.0	100.0	0.0	0.0	100.0
Sethoxydim	50.0	0.1	86.5	13.5	10.7	89.3
TCA	7.2	0.0	100.0	0.0	0.0	100.0
Triallate	1675.3	4.1	94.8	5.2	3.1	96.9
Trifluralin	4540.6	11.1	92.2	7.8	3.6	96.4
2,4-D	548.5	1.3	77.7	22.3	16.5	83.5
2,4-D amine	5137.9	12.6	82.9	17.1	12.3	87.7
2,4-D ester	2887.8	7.1	86.4	13.6	8.5	91.5
2,4-DB	0.3	0.0	100.0	0.0	0.0	100.0
Total	24819.3	60.6	86.6	13.4	9.3	90.7

¹McMullen, 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 Univ. in cooperation with North Dakota Crop and Livestock Reporting Service, Agronomy Report 3. 31p.

Table 21D. Herbicide usage in North Dakota, 1978¹.

Herbicides	Acres treated (1000)	Acres treated (%)	Applicator		Method of application	
			Farm operator (%)	Custom (%)	Aerial (%)	Ground (%)
Alachlor	150.2	0.5	84	16	1	99
Atrazine	61.9	0.2	78	22	6	94
Barban	624.2	1.9	71	29	24	76
Bentazon	16.9	0.0	47	53	69	31
Bromoxynil	21.2	0.1	45	55	45	55
Bromoxynil + MCPA	26.7	0.1	69	31	31	69
Chloramben	14.6	0.0	90	10	0	100
Cyanazine	127.5	0.4	75	25	4	96
Cycloate	6.0	0.0	100	0	0	100
Dalapon	48.8	0.2	61	39	23	77
Desmedipham	30.7	0.1	99	1	0	110
Diallate	72.1	0.2	97	3	2	98
Dicamba	135.2	0.4	75	25	12	88
Dicamba + MCPA	140.4	0.4	75	25	13	87
Diclofop	1.7	0.0	92	8	0	100
Diethatyl	0.1	0.0	100	0	0	100
Difenzoquat	66.9	0.2	83	17	13	87
Dinitramine	24.4	0.1	90	10	0	100
Endothall	2.9	0.0	72	28	22	78
EPTC	490.4	1.5	95	5	2	98
EPTC + safener	27.7	0.1	93	7	6	94
Fluchloralin	2.6	0.0	100	0	0	100
Glyphosate	9.2	0.0	41	59	0	100
Linuron	1.6	0.0	100	0	0	100
MCPA	1744.4	5.4	77	23	11	89
Metolachlor	4.9	0.0	34	66	66	34
Metribuzin	12.7	0.0	91	9	0	100
Butylate	2.7	0.0	75	25	0	100
Paraquat	0.3	0.0	100	100		
Pendimethalin	7.8	0.0	17	83	95	5
Phenmedipham	8.9	0.0	100	0	0	100
Picloram	374.2	1.2	68	32	6	94
Profluralin	147.0	0.5	72	27	2	98
Propachlor	0.5	0.0	100	0	100	
Propanil	18.0	0.0	91	9	3	97
Pyrazon	15.7	0.0	91	9	0	100
TCA	23.7	0.1	79	21	12	88
Triallate	1045.9	3.2	88	12	2	97
Trifluralin	2052.5	6.3	85	15	3	97
2,4-D all	9339.1	28.9	73	27	16	90
Unknown	45.3	0.2	45	55	9	87
Total	16947.3	52.4	76	24	12	92

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

Table 22A. INSECTICIDE Usage in North Dakota, 1992.

Insecticide	Acres treated (1000)	Acres treated (%)	Applications				Applicator		Method of application	
			1	2	3	4	Farm operator	Custom	Aerial	Ground
			(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Acephate	2.3	0.0	43.7	56.3	.	.	56.3	43.7	43.7	56.3
Aldicarb	4.2	0.0	100.0	.	.	.	100.0	.	.	100.0
Azinphos-methyl	17.9	0.0	100.0	.	.	.	94.9	5.1	5.1	94.9
Carbaryl	61.8	0.2	88.0	2.2	9.8	.	50.6	49.4	43.2	56.8
Carbofuran	247.0	0.6	47.1	43.7	9.3	.	69.6	30.4	30.4	69.6
Chlorpyrifos	88.7	0.2	79.0	10.0	11.0	.	60.4	39.6	42.1	57.9
Diazinon	1.5	0.0	100.0	.	.	.	100.0	.	.	100.0
Dimethoate	10.1	0.0	100.0	.	.	.	82.2	17.8	17.8	82.2
Encapsulated methyl parathion	16.4	0.0	59.5	40.5	.	.	59.8	40.2	40.2	59.8
Endosulfan	61.6	0.2	56.5	43.5	.	.	87.5	12.5	12.5	87.5
Esfenvalerate	160.7	0.4	90.4	7.2	2.4	.	54.8	45.2	47.5	52.5
Ethyl parathion	127.6	0.3	86.8	13.2	.	.	5.2	94.8	94.6	5.4
Fenvalerate	4.5	0.0	100.0	.	.	.	44.3	55.7	55.7	44.3
Fonofos	13.7	0.0	100.0	.	.	.	.	100.0	100.0	.
Malathion	27.6	0.1	93.1	6.1	0.8	.	48.0	52.0	52.0	48.0
Methamidophos	29.6	0.1	9.9	35.4	11.7	.	34.2	65.8	65.8	34.2
Methyl parathion	82.5	0.2	91.9	8.1	.	.	4.3	95.7	94.7	5.3
Nosema locusate fungus	4.6	0.0	11.5	88.5	.	.	100.0	.	.	100.0
Permethrin	15.0	0.0	100.0	.	.	.	1.6	98.4	92.7	7.3
Phorate	18.5	0.0	100.0	.	.	.	87.8	12.2	16.4	83.6
Phosphamidon	1.4	0.0	100.0	.	.	.	100.0	.	.	100.0
Tefluthrin	45.9	0.1	100.0	.	.	.	100.0	.	.	100.0
Terbufos	126.6	0.3	100.0	.	.	.	94.6	5.4	1.5	98.5
TOTAL	1169.6	3.0	77.5	17.5	3.9	.	56.8	43.2	42.8	57.2

Table 22B. INSECTICIDE Usage in North Dakota, 1989¹.

Insecticide	Acres treated (1000)	Acres treated (%)	Applications				Applicator		Method of application	
			1	2	3	4	Farm operator	Custom	Aerial	Ground
			(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Acephate	0.1	0.0	100.0	.	.	.	100.0	.	.	100.0
Aldicarb	12.5	0.0	100.0	.	.	.	100.0	.	.	100.0
Azinphos-methyl	0.6	0.0	100.0	.	.	.	.	100.0	100.0	.
Carbaryl	80.3	0.2	95.8	1.3	2.8	.	41.7	58.3	57.7	42.3
Carbofuran	530.4	1.3	78.8	18.1	2.6	0.5	58.5	41.5	46.5	53.5
Chlordane	0.1	0.0	.	100.0	.	.	100.0	.	.	100.0
Chlorpyrifos	71.9	0.2	97.4	2.6	.	.	72.7	27.3	25.1	74.9
Dimethoate	14.2	0.0	100.0	.	.	.	91.1	8.9	5.6	94.4
Disulfoton	4.1	0.0	100.0	.	.	.	.	100.0	100.0	.
Encapsulated methyl parathion	12.6	0.0	88.9	11.1	.	.	45.5	54.5	54.5	45.5
Endosulfan	33.7	0.1	56.5	43.5	.	.	100.0	.	.	100.0
Esfenvalerate	261.4	0.7	75.5	15.1	1.6	7.7	55.9	44.1	44.2	54.8
Ethyl parathion	348.1	0.9	81.1	18.9	.	.	8.7	91.3	95.1	4.9
Fenvalerate	280.4	0.7	73.8	24.4	1.8	.	48.7	51.3	59.3	40.7
Fonofos	1.9	0.0	100.0	.	.	.	79.7	20.3	20.3	79.7
Malathion	101.4	0.3	67.7	32.3	.	.	27.8	72.2	71.9	28.1
Methidathion	1.6	0.0	100.0	.	.	.	.	100.0	100.0	.
Methyl parathion	197.9	0.5	76.9	11.5	11.6	.	4.4	95.6	99.1	0.9
Oxamyl	2.5	0.0	100.0	.	.	.	100.0	.	.	100.0
Phorate	68.8	0.2	100.0	.	.	.	100.0	.	2.4	97.6
Phosphamidon	68.3	0.2	84.2	15.8	.	.	87.6	12.4	12.4	87.6
Pyrethroid	4.4	0.0	100.0	.	.	.	64.8	35.2	64.8	35.2
Terbufos	132.1	0.3	98.9	1.1	.	.	94.9	5.1	.	100.1
Trichlorafon	4.4	0.0	100.0	.	.	.	.	100.0	100.0	.
Total	2233.7	5.7	80.8	16.0	2.2	1.0	48.0	52.0	54.9	45.1

¹McMullen, M.P., A.G. Dexter, J.D. Nalewaja, and G. Dahl. 1990. 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 No. 1.

Table 22C. INSECTICIDE usage in North Dakota, 1984¹.

Insecticide	Acres treated (1000)	Acres treated (%)	Applicator		Method of application	
			Farm operator (%)	Custom (%)	Aerial (%)	Ground (%)
Acephate	30.8	0.0	51.8	45.2	45.5	54.5
Aldicarb	9.7	0.0	67.2	32.8	7.7	92.3
Carbaryl	78.4	0.2	71.4	28.6	28.6	71.4
Carbofuran	419.7	1.0	57.0	53.0	42.6	47.4
Chlorpyrifos	43.1	0.1	91.7	8.3	7.7	92.3
Diazinon	6.4	0.0	5.8	94.2	94.2	5.8
Dimethoate	0.4	0.0	0.0	100.0	100.0	0.0
Dioxathion	1.2	0.0	5.9	94.1	94.1	5.9
Disulfoton	0.5	0.0	100.0	0.0	0.0	100.0
Endosulfan	3.6	0.0	35.7	64.3	64.3	35.7
Fenvalerate	1414.1	3.5	37.2	62.8	64.0	36.0
Fonofos	7.7	0.0	91.0	9.0	9.0	91.0
Lindane	27.7	0.0	100.0	0.0	0.0	100.0
Malathion	101.9	0.2	18.1	81.9	95.5	14.5
Methidathion	6.5	0.0	0.0	100.0	100.0	0.0
Methoxychlor	0.4	0.0	100.0	0.0	0.0	100.0
Methyl parathion	14.5	0.0	9.1	90.9	90.9	9.1
Monocrotophos	9.5	0.0	79.4	20.6	20.6	79.4
Naled	0.3	0.0	100.0	0.0	0.0	100.0
Oxamyl	1.8	0.0	100.0	0.0	0.0	100.0
Parathion	504.8	1.2	4.5	95.5	92.1	7.9
Permethrin	24.6	0.0	89.5	10.5	10.5	89.5
Phorate	55.9	0.1	97.9	2.1	2.1	97.9
Phosphamidon	31.0	0.0	95.8	4.2	4.2	95.8
Terbufos	74.6	0.2	98.9	1.1	1.1	98.9
Toxaphene	10.4	0.0	57.2	42.8	42.8	57.2
Trichlorafon	0.7	0.0	100.0	0.0	0.0	100.0
Total	2880.2	7.0	41.1	58.9	58.8	41.2

¹McMullen, 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.

Table 22D. Insecticide usage in North Dakota, 1978¹.

Insecticide	Acres treated (1000)	Acres treated (%)	Applicator		Method of application	
			Farm operator (%)	Custom (%)	Aerial (%)	Ground (%)
Aldicarb	31.3	0.1	99	1	0	100
Azinphos-methyl	72.8	0.2	97	3	12	88
Carbaryl	4.6	0.0	83	17	11	89
Carbofuran	12.4	0.0	100	0	0	100
Chlordane	4.9	0.0	100	0	0	100
Diazinon	2.5	0.0	100	0	0	100
Disulfoton	21.3	0.0	100	0	0	100
Endosulfan	11.1	0.0	90	10	58	42
Ethoprop	1.4	0.0	100	0	0	0
Fonofos	17.7	0.0	98	2	0	94
Methamidophos	0.7	0.0	100	0	0	100
Monocrotophos	15.1	0.0	100	0	0	100
Methyl parathion	17.7	0.0	55	45	67	33
Methyl parathion (encap)	1.0	0.0	0	100	100	0
Malathion	6.3	0.0	12	88	47	30
Methidathion	9.9	0.0	40	60	60	40
Naled	0.4	0.0	100	100	0	
Phorate	30.6	0.0	96	4	2	98
Phosphamidon	9.1	0.0	71	29	29	71
Terbufos	24.6	0.0	100	0	0	100
Trichlorafon	0.2	0.0	100	0	0	100
Toxaphene	65.1	0.2	50	50	49	50
Unknown	4.9	0.0	63	37	37	63
Total	365.5	1.1	83	17	21	79

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

TABLE 23A. FUNGICIDE Usage in North Dakota, 1992.

Fungicide	Acres treated (1000)	Acres treated (%)	Applications				Applicator		Method of application	
			1	2	3	4	Farm operator	Custom	Aerial	Ground
			(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Benlate	1.9	0.0	100.0	.	.	.	100.0	.	.	100.0
Chlorothalonil	92.1	0.2	33.6	9.5	.	56.9	62.9	37.1	37.1	62.9
Copper	0.2	0.0	100.0	.	.	.	.	100.0	100.0	.
Mancozeb	361.1	0.9	45.4	22.9	21.1	3.1	57.1	42.9	42.8	57.2
Maneb + triphenyltin hydroxide	36.1	0.1	70.1	29.9	.	.	82.3	17.7	17.7	82.3
Maneb + zinc	45.8	0.1	61.0	11.2	.	.	57.0	43.0	41.4	58.6
Metalaxyl + chlorothalonil	0.4	0.0	100.0	.	.	.	.	100.0	100.0	.
Metalaxyl + mancozeb	21.6	0.1	79.1	20.9	.	.	43.8	56.2	56.2	43.8
Propiconazole	226.3	0.6	100.0	.	.	.	12.6	87.4	87.4	12.6
Ridomil	0.7	0.0	100.0	.	.	.	100.0	.	.	100.0
Sulfur	1.4	0.0	100.0	.	.	.	15.5	84.5	84.5	15.5
Thiophanate methyl	5.2	0.0	100.0	.	.	.	67.5	32.5	32.5	67.5
Triademefon	2.5	0.0	100.0	.	.	.	.	100.0	100.0	.
Triphenyltin hydroxide	133.6	0.3	46.2	26.3	25.3	2.2	38.1	61.9	68.3	31.7
Total	929.0	2.4	60.9	15.8	11.9	7.2	44.7	55.3	56.1	43.9

Table 23B. FUNGICIDE Usage in North Dakota, 1989¹.

Fungicide	Acres treated (1000)	Acres treated (%)	Applications				Applicator		Method of application	
			1	2	3	4	Farm operator	Custom	Aerial	Ground
			(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Benomyl	4.1	0.0	3.4	96.6	.	.	100.0	.	.	100.0
Mancozeb	165.5	0.4	47.5	7.7	36.6	8.2	45.5	54.5	57.1	42.9
Maneb	7.7	0.0	100.0	.	.	.	39.0	61.0	61.0	39.0
Maneb + zinc	35.6	0.1	22.2	77.8	.	.	50.3	49.7	49.7	50.3
Metiram + maneb	24.0	0.1	14.2	27.7	58.0	.	37.5	62.5	62.5	37.5
Propiconazole	162.7	0.4	99.0	1.0	.	.	15.3	84.7	86.8	13.2
Sulfur	3.9	0.0	.	100.0	.	.	100.0	.	.	100.0
Sulfur + copper	2.8	0.0	100.0	.	.	.	100.0	.	.	100.0
Thiabendazole	3.4	0.0	100.0	.	.	.	100.0	.	.	100.0
Triphenyltin hydroxide	172.6	0.4	25.6	46.8	24.5	3.2	72.9	27.1	25.9	74.1
Total	581.5	1.5	53.1	23.6	20.1	3.3	46.4	53.6	54.6	45.4

¹McMullen, M.P., A.G. Dexter, J.D. Nalewaja, and G. Dahl. 1990. 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 No. 1.

Table 23C. FUNGICIDE usage in North Dakota, 1984¹.

Fungicide	Acres treated (1000)	Acres treated (%)	Applicator		Method of application	
			Farm operator (%)	Custom (%)	Aerial (%)	Ground (%)
Benomyl	1.2	0.0	0.0	100.0	100.0	0.0
Copper	3.5	0.0	78.9	21.1	21.1	78.9
Mancozeb	186.4	0.5	16.1	83.9	82.5	17.5
Maneb	57.9	0.1	61.2	38.8	38.8	61.2
Maneb + zinc	117.8	0.2	43.7	56.3	55.8	44.2
Metiram + maneb	16.5	0.0	88.8	11.2	11.2	88.8
Sulfur	2.7	0.0	0.0	100.0	0.0	100.0
Thiabendazole	5.7	0.0	58.5	41.5	41.5	58.5
Triademefon	0.3	0.0	0.0	100.0	100.0	0.0
Triphenyltin hydroxide	113.5	0.3	36.5	63.5	65.9	34.1
Total	505.5	1.2	35.5	64.5	64.1	35.9

¹McMullen, 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.

Table 23D. FUNGICIDE usage in North Dakota, 1978¹.

Fungicide	Acres treated (1000)	Acres treated (%)	Applicator		Method of application	
			Farm operator (%)	Custom (%)	Aerial (%)	Ground (%)
Benomyl	1.7	0.0	0	100	100	0
Captafol	5.0	0.0	100	0	0	100
Chlorothalonil	4.2	0.0	90	10	10	90
Copper hydroxide	2.9	0.0	0	100	100	0
Mancozeb	45.9	0.1	68	32	32	68
Maneb	15.1	0.0	50	50	100	0
Manzate 200	0.4	0.0	0	100	100	0
Thiabendazole	25.6	0.1	82	18	22	78
Zineb	3.0	0.0	100	0	0	100
Total	103.8	0.3	69	31	39	61

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