Pesticide Use and Pest Management Practices for Major Crops in North Dakota - 2000

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PESTICIDE USE FOR SOYBEAN

Soybean is a full season crop primarily grown in southeastern North Dakota. However, acreage has been increasing in recent years (Table 18), particularly, northward and westward. The need for a long growing season and satisfactory soil moisture during flowering and pod filling may limit the westward expansion in the state, though.

Ninety-four percent of the soybean acres were treated with at least one herbicide (Table 1). Because of multiple active ingredients applied to some acres, the equivalent of 165.7% of the soybean acres were treated with herbicides. The most frequently used herbicide was glyphosate on 35.8% of the acres (Table 19). Use of this active reflects the statewide planting of glyphosate-resistant soybean on 28.7% of the acres (Table 42). The next most frequently used active was imazethapyr, applied to 27.6% of the soybean acres. Bentazon was applied to 20.2%, trifluralin to 20.3%, imazomox to 17.5%, sethoxydim to 13.3%, and ethalfluralin to 8.6% of the soybean acreage. The use of trifluralin and bentazon has declined over the past 10 years, while glyphosate and imazamox have increased (Figure 7). Over 76% of the herbicides were applied by the farm operator and over 97% by ground equipment.

The only insecticide mentioned by survey respondents was esfenvalerate. The only fungicide mentioned was mancozeb. The dessicant, paraquat, was also mentioned. Usage of these three products was insufficient to project acreage use estimates.

TABLE 18. Production summary for SOYBEAN, North Dakota, 1996-2000 (NDASS, 2001).

Year	Acres		Yield		Marketing Year Avg. Price	Value of Production	Value per harvested Acre	U.S. Production	
	Planted	Harvested	Per Acre	Production					
	(000 Acres)		*(Bu.)*	*(000 Bu.)*	*($/Bu.)*	*(000 Dols.)*	*(Dols.)*	*(%)*	*(Rank)*
1996	850	845	29.0	24,505	7.05	172,760	204.45	1	18
1997	1,150	1,140	29.5	33,630	6.10	205,143	179.95	1	18
1998	1,550	1,475	32.0	47,200	4.64	219,008	148.48	2	13
1999	1,350	1,340	35.0	46,900	4.19	196,511	146.65	2	13
2000	1,900	1,850	33.0	61,050	4.00	250,416	135.36	2	11

TABLE 19 . SOYBEAN: Herbicide, Insecticide, Fungicide and Desiccant usage and application method. North Dakota, 2000

	Acres Treated [2]	Acres Treated	Applications			Applicator		Method of Application	
			1 X	2 X	3 X	Farm Operator	Custom	Aerial	Ground
	(1000)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Herbicide [1]									
2,4-D	NS	NS	NS	NS	NS	NS	NS	NS	NS
Acifluorfen	19.5	1.0	100.0	---	---	91.3	8.7	---	100.0
Acifluorfen + Bentazon	5.8	0.3	100.0	---	---	89.1	10.9	10.9	90.8
Bentazon	183.5	9.7	87.3	3.4	9.3	77.2	22.8	9.2	90.8
Bentazon + Sethoxydim	193.3	10.2	100.0	---	---	62.1	37.9	5.4	94.6

Table 19. ***Continued***

	Acres Treated [2]	Acres Treated	Applications 1 X	Applications 2 X	Applications 3 X	Applicator Farm Operator	Applicator Custom	Method of Application Aerial	Method of Application Ground
	(1000)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Clethodim	78.1	4.1	19.1	80.9	---	90.0	10.0	8.9	91.1
Clopyralid + 2,4-D	NS	NS	NS	NS	NS	NS	NS	NS	NS
Cloransulam Methyl	72.4	3.8	100.0	---	---	90.7	9.3	---	100.0
Dicamba	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dicamba + Imazethapyr	NS	NS	NS	NS	NS	NS	NS	NS	NS
EPTC	NS	NS	NS	NS	NS	NS	NS	NS	NS
Ethalfluralin	163.4	8.6	100.0	---	---	63.8	36.2	3.9	96.1
Fenoxaprop-P + Safener	NS	NS	NS	NS	NS	NS	NS	NS	NS
Fluazifop-P	NS	NS	NS	NS	NS	NS	NS	NS	NS
Fluazifop-P + Fenoxaprop P	29.4	1.5	100.0	---	---	78.3	21.7	3.6	96.4
Flumetsulam	32.3	1.7	100.0	---	---	67.4	32.6	---	100.0
Flumetsulam + Metolachlor	NS	NS	NS	NS	NS	NS	NS	NS	NS
Flumetsulam + Trifluralin	19.0	1.0	100.0	---	---	100.0	---	---	100.0
Fomesafen	131.6	6.9	99.4	0.6	---	67.4	32.6	10.1	89.9
Glyphosate	666.8	35.1	63.2	36.6	0.3	72.2	27.8	2.0	98.0
Hexazinone	NS	NS	NS	NS	NS	NS	NS	NS	NS
Imazamox	331.8	17.5	100.0	---	---	80.0	20.0	9.5	90.5
Imazethapyr	446.5	23.5	100.0	---	---	76.6	23.4	3.0	97.0
Imazethapyr + Glyphosate	12.9	0.7	100.0	---	---	93.2	6.8	---	100.0
Imazethapyr + Pendimethalin	65.5	3.4	100.0	---	---	84.2	15.8	7.2	92.8
Lactofen	82.1	4.3	100.0	---	---	92.0	8.0	3.8	96.2
Metribuzin	NS	NS	NS	NS	NS	NS	NS	NS	NS
Paraquat	NS	NS	NS	NS	NS	NS	NS	NS	NS
Pendimethalin	63.0	3.3	100.0	---	---	91.6	8.4	---	100.0
Quizalofop-P	30.7	1.6	97.3	2.7	---	93.9	6.1	---	100.0
Sethoxydim	58.7	3.1	67.3	3.6	29.1	88.6	11.4	---	100.0
Sulfentrazone	NS	NS	NS	NS	NS	NS	NS	NS	NS
Thifensulfuron	48.2	2.5	100.0	---	---	86.4	13.6	---	100.0
Thifensulfuron + Tribenuron	3.3	0.2	100.0	---	---	63.9	36.1	---	100.0
Tralkoxydim	NS	NS	NS	NS	NS	NS	NS	NS	NS
Trifluralin	366.4	19.3	99.6	0.4	---	80.7	19.3	1.3	98.7
All Herbicides	3148.6	165.7	88.7	10.1	1.1	76.9	23.1	4.2	95.8
Insecticide									
Esfenvalerate	NS	NS	NS	NS	NS	NS	NS	NS	NS
All Insecticides	NS	NS	NS	NS	NS	NS	NS	NS	NS

Table 19. ***Continued***

Fungicide									
Mancozeb	NS	NS	NS	NS	NS	NS	NS	NS	NS
All Fungicides	NS	NS	NS	NS	NS	NS	NS	NS	NS
Desiccants									
Paraquat	NS	NS	NS	NS	NS	NS	NS	NS	NS
All Desiccants	NS	NS	NS	NS	NS	NS	NS	NS	NS

[1] Herbicides applied as a tank mixture were considered separately unless a commercial premix was used.
[2] Multiple applications to the same acre were reported as separate values. Acres treated can exceed 100% of the planted acres.
NS - not sufficient to estimate district or state projections.

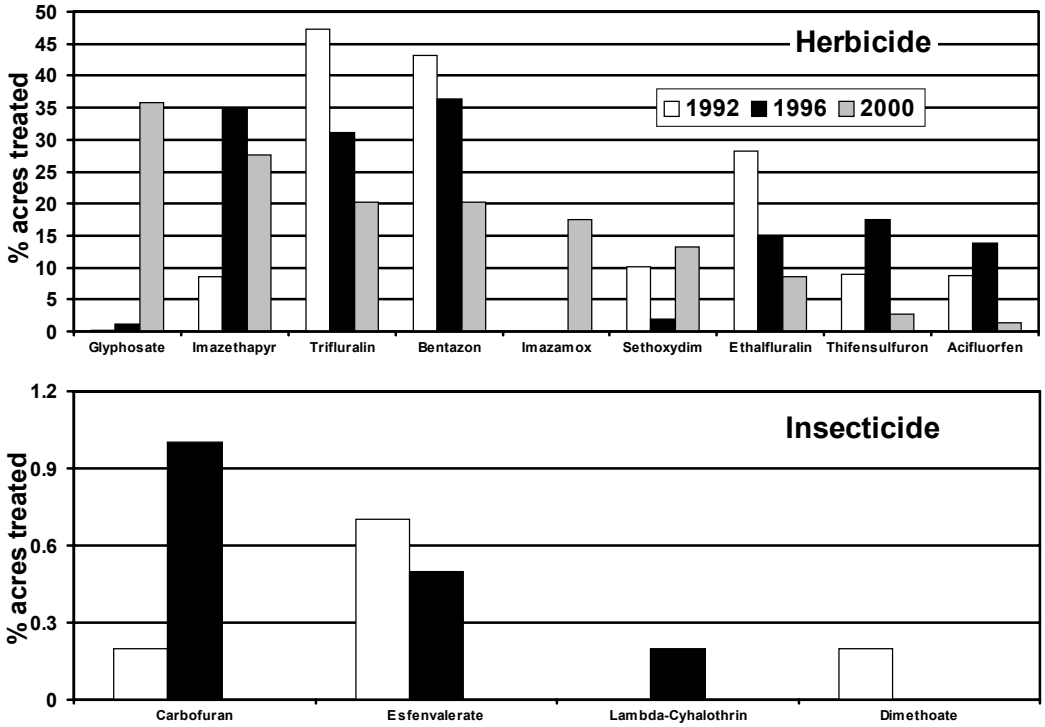

Figure 7. Percent of North Dakota soybean acres treated with the top five active ingredients from the herbicide and insecticide pesticide groups reported in the 1992, 1996, and 2000 statewide pesticide use surveys.