PP-1265 (Revised)

2006 DRY BEAN Grower Survey

of Pest Problems and Pesticide Use

in Minnesota and North Dakota

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Index

Introduction 3

2006 Dry Bean Grower Survey

Table 1. Number of Northarvest dry bean growers responding, total acres and acres planted by respondents in 2006 4

Table 2. Dry bean acres irrigated, harvested and damaged by hail, frost and water in 2006 4

Table 3. Sources of dry edible bean seed used for planting by respondents in 2006 4

Table 4. Market classes of dry bean grown by respondents in 2006 4

Table 5. Dry bean varieties grown in 2006 by respondents **5**

Table 6. Importance of plant architecture in dry bean production in 2006 5

Table 7. Importance of plant architecture to direct combining in 2006 5

Table 8. Worst dry edible bean production problem in 2006 reported by respondents **6**

Table 9. Worst weed problem in dry edible bean fields in 2006 6

Table 10. Weeds ranked as one of the three worst in dry edible bean fields in 2006 7

Table 11. Weed control practices used on dry edible bean fields in 2006 7

Table 12. Weed control practices used, by bean market class, in 2006 8

Table 13. Desiccants used on dry edible bean fields in 2006 8

Table 14. Worst disease problem on dry edible bean in 2006 8

Table 15. Diseases ranked as one of the three worst on dry edible bean in 2006 9

Table 16. Fungicides applied to dry edible bean fields in 2006 10

Table 17. Use of fungicide seed treatment on dry edible bean in 2006 10

Table 18. Worst insect problem on dry edible bean in 2006 11

Table 19. Insects ranked as one of the three worst in dry edible bean fields in 2006 11

Table 20. Use of insecticides on dry edible bean fields in 2006 11

Table 21. Use of insecticide seed treatment on dry edible bean in 2006 11

Table 22. Use of fertilizers on dry edible bean fields in 2006 12

Table 23. Use of Rhizobium inoculants on dry edible bean in 2006 12

Table 24. Use of soil test prior to fertilization of dry edible bean fields in 2006 12

Table 25. Crop grown the year prior to dry edible bean in 2006 12

Table 26. Number of years in dry bean rotation in 2006 12

Other responses 13

References 13

Appendix I. Copy of 2006 Dry Bean Grower Survey Form 14

Acknowledgements 16

Introduction

This (2006) dry bean grower survey is the18th annual survey of varieties grown, pest problems, pesticide use and grower practices of the Northarvest Bean Growers Association, an association of dry edible bean growers in Minnesota and North Dakota. Research and Extension faculty at North Dakota State University and the directors of the Northarvest Bean Growers Association developed the survey forms (Appendix I). The survey was mailed to all Northarvest bean growers. All participants in the survey were anonymous.

Results of previous surveys dated 1987-2000, 2002 and 2004-2005 have been published (1-15). No surveys were conducted in 1993 and 2001. In 2003, the survey was completed by dry bean producers who attended the Northarvest Bean Day in Fargo during the winter. However, the lack of responses made processing and analyses of results unreliable, so no report was compiled. In the tables, the total percentages do not always add up to 100 percent because not all of the respondents answered every question.

Throughout this report, trade names of chemicals often are presented as an aid for clearer communication. Mention of trade names does not constitute endorsement or recommendation by North Dakota State University or the Northarvest Bean Growers Association.

2006 Dry Bean Grower Survey

Table 1. Number of Northarvest dry bean growers responding, total acres and acres planted by respondents in 2006.

Growers	No. of respondents	Respondents' acres	Total acres[a]	Acres surveyed
				(% of total)
Minnesota	69	20,443	145,000	14.1
North Dakota	168	87,174	670,000	13.0
Northarvest	237	107,617	815,000	13.2

[a] Total of dry bean acres planted for area (source: USDA National Agricultural Statistics Service).

Table 2. Dry bean acres irrigated, harvested and damaged by hail, frost and water in 2006.

	Minnesota	North Dakota	Northarvest
	% of respondents' acres		
Irrigated	18.9	4.4	7.1
Harvested	93.8	97.5	96.8
Hail damaged	6.9	7.3	7.2
Frost damaged	7.2	4.6	5.1
Water damaged	6.9	4.3	4.8

Table 3. Sources of dry edible bean seed used for planting by respondents in 2006.

Seed source	Minnesota	North Dakota	Northarvest
	% of respondents' acres		
Bin run	0	10.3	8.3
Canada	0	0	0
Northarvest	11.8	31.9	28.1
Western	87.5	55.1	61.2
Not reported	0.7	2.7	2.4

Table 4. Market classes of dry bean grown by respondents in 2006.

Market class	Minnesota	North Dakota	Northarvest
	% of respondents' acres		
Black	3.6	6.7	6.1
Kidney	45.2	0.1	8.7
Navy	33.4	16.7	19.9
Pink	2.3	2.8	2.7
Pinto	12.4	72.2	60.8
Other	3.1	1.5	1.8

Table 5. Dry bean varieties grown in 2006 by respondents.

		Acres planted[a]					
Variety	**Class[b]**	**MN**	**%**	**ND**	**%**	**Northarvest**	**%**
Maverick	P	937	4.6	42,934	49.3	43,871	40.7
Buster	P	979	4.8	6,965	7.9	7,944	7.4
Other pinto	P	135	0.7	5,345	6.1	5,480	5.0
Topaz	P	0	0	3,782	4.3	3,782	3.5
GTS 900	P	0	0	2,733	3.1	2,733	2.5
Winchester	P	0	0	725	0.8	725	0.7
Pintoba	P	390	1.9	170	0.2	560	0.5
Remington	P	100	0.5	250	0.3	350	0.3
Total pinto	P	**2,541**	**12.4**	**62,904**	**72.2**	**65,445**	**60.8**
Norstar	N	1,190	5.8	3,577	4.1	4,767	4.4
Navigator	N	972	4.8	3,521	4.0	4,493	4.2
Other navy	N	641	3.1	3,797	4.4	4,438	4.1
Ensign	N	1,081	5.3	2,778	3.2	3,859	3.6
Vista	N	2,474	12.1	483	0.6	2,957	2.7
Cirrus	N	294	1.4	350	0.4	644	0.6
Mayflower	N	190	0.9	0	0	190	0.2
T9903	N	0	0	60	0.1	60	0.1
Rally	N	0	0	0	0	0	0
Arthur	N	0	0	0	0	0	0
Total navy	N	**6,842**	**33.5**	**14,566**	**16.7**	**21,408**	**19.9**
Montcalm	K	3,949	19.3	133	0.2	4,082	3.8
Red Hawk	K	3,940	19.3	0	0	3,940	3.7
Other kidney	K	1,335	6.5	0	0	1,335	1.2
Total kidney	K	**9,224**	**45.1**	**133**	**0.2**	**9,357**	**8.7**
Eclipse	B	110	0.5	2,839	3.3	2,949	2.7
T-39	B	280	1.4	2,238	2.6	2,518	2.3
Other black	B	288	1.4	476	0.5	764	0.7
Jaguar	B	54	0.3	310	0.4	364	0.3
Onyx	B	0	0	0	0	0	0
Total black	B	**732**	**3.6**	**5,863**	**6.7**	**6,595**	**6.1**
Any pink	PK	467	2.3	2,429	2.8	2,896	2.7
Total pink	PK	**467**	**2.3**	**2429**	**2.8**	**2,896**	**2.7**
Other varieties		637	3.1	1,279	1.5	1,916	1.8
Total		**20,443**	**100.0**	**87,174**	**100.0**	**107,617**	**100.0**

[a] Respondents' acres only.

[b] P = pinto; N = navy; K = kidney; B = black; PK = pink

Table 6. Importance of plant architecture in dry bean production in 2006.

Importance	Respondents	Respondents
	(no.)	(%)
Minnesota		
Low	2	2.9
Moderate	22	31.9
High	35	50.7
North Dakota		
Low	8	4.8
Moderate	66	39.3
High	78	46.4
Northarvest		
Low	10	4.2
Moderate	88	37.1
High	113	47.7

Table 7. Importance of plant architecture to direct combining in 2006.

Importance	Respondents	Respondents
	(no.)	(%)
Minnesota		
Low	10	17.9
Moderate	11	19.6
High	35	62.5
North Dakota		
Low	16	10.6
Moderate	21	13.9
High	114	75.5
Northarvest		
Low	26	11.0
Moderate	33	13.9
High	149	62.9

Table 8. Worst dry edible bean production problem in 2006 reported by respondents.

Worst production problem	Respondents	Respondents	Acres reported[a]	Acres reported[a]
	(no.)	(%)	(no.)	(%)
Minnesota				
Weeds	15	22.7	5,809	29.1
Weather	16	24.2	4,946	24.7
Harvest	11	16.7	2,824	14.1
Emergence/stand	7	10.6	2,663	13.3
Other	6	9.1	2,266	11.3
None	6	9.1	668	3.4
Disease	4	6.1	665	3.3
Delayed planting	1	1.5	152	0.8
Insects	0	0	0	0
Drift injury	0	0	0	0
Herbicide injury	0	0	0	0
Total	**66**	**100.0**	**19,993**	**100.0**
North Dakota				
Weather	64	39.5	33,860	38.8
Weeds	40	24.7	23,590	27.1
None	15	9.3	7,239	8.3
Harvest	17	10.5	6,077	7.0
Emergence/stand	8	4.9	3,550	4.1
Disease	5	3.1	3,400	3.9
Delayed planting	7	4.3	2,159	2.5
Other	3	1.9	1,130	1.3
Herbicide injury	2	1.2	865	1.0
Micro. nut. defic.	1	0.6	900	1.0
Total	**162**	**100.0**	**82,770**	**94.9**
Northarvest				
Weather	80	35.1	38,806	36.1
Weeds	55	24.1	29,399	27.3
Harvest	28	12.3	8,901	8.3
None	21	9.2	7,907	7.3
Emergence/stand	15	6.6	6,213	5.8
Disease	9	4.0	4,065	3.8
Other	9	3.9	3,396	3.2
Delayed planting	8	3.5	2,311	2.1
Micro. nut. defic.	1	0.4	900	0.8
Herbicide injury	2	0.9	865	0.8
Insects	0	0.0	0	0.0
Drift injury	0	0.0	0	0.0
Total	**228**	**100.0**	**102,763**	**95.5**

[a] Respondents' acres only.

Table 9. Worst weed problem in dry edible bean fields in 2006.

Weed[a]	Respondents	Respondents	Acres reported[b]	Acres reported[b]
	(no.)	(%)	(no.)	(%)
Minnesota				
Lambsquarters	13	19.1	5,246	25.7
Kochia	10	14.7	3,906	19.1
Ragweed	11	16.2	3,597	17.6
Other	6	8.8	2,605	12.7
Nightshade	8	11.8	1,593	7.8
Cocklebur	7	10.3	1,517	7.4
Redroot pigweed	7	10.3	1,178	5.8
Canada thistle	3	4.4	431	2.1
Foxtail	2	2.9	221	1.1
Biennial wormwood	1	1.5	152	0.7
Volunteer grain	0	0.0	0	0
None	0	0.0	0	0
Total	**68**	**100.0**	**20,446**	**100.0**
North Dakota				
Kochia	47	28.5	22,815	26.2
Nightshade	25	15.2	15,404	17.7
Canada thistle	26	15.8	9,892	11.3
Lambsquarters	14	8.5	8,582	9.8
Biennial wormwood	10	6.1	6,454	7.4
Redroot pigweed	11	6.7	6,258	7.2
Volunteer grain	3	1.8	4,100	4.7
Wild mustard	7	4.2	3,244	3.7
Cocklebur	7	4.2	2,965	3.4
Ragweed	4	2.4	2,750	3.2
None	4	2.4	1,705	2.0
Foxtail	4	2.4	383	0.4
Wild oat	1	0.6	394	0.5
Other	2	1.2	128	0.1
Total	**165**	**100.0**	**85,074**	**97.6**
Northarvest				
Kochia	57	24.6	26,721	24.8
Nightshade	33	14.2	16,997	15.8
Lambsquarters	27	11.6	13,825	12.8
Canada thistle	29	12.5	10,323	9.6
Redroot pigweed	18	7.8	7,436	6.9
Biennial wormwood	11	4.7	6,606	6.1
Ragweed	15	6.5	6,347	5.9
Cocklebur	14	6.0	4,482	4.2
Volunteer grain	3	1.3	4,100	3.8
Wild mustard	7	3.0	3,244	3.0
Other	7	3.0	2,733	2.5
None	4	1.7	1,705	1.6
Foxtail	6	2.6	604	0.6
Wild oat	1	0.4	394	0.4
Total	**232**	**100.0**	**105,517**	**98.0**

[a] Ranked as No. 1 weed problem on more than 0.5% of respondents' acres.

[b] Respondents' acres only.

Table 10. Weeds ranked as one of the three worst in dry edible bean fields in 2006.

Weed[a]	Respondents	Respondents	Acres reported[b]	Acres reported[b]
	(no.)	(%)	(no.)	(%)
Minnesota				
Lambsquarters	42	60.9	13,438	65.7
Redroot pigweed	35	50.7	10,586	51.8
Ragweed	30	43.5	10,251	50.1
Kochia	18	26.1	7,621	37.3
Canada thistle	15	21.7	4,814	23.5
Nightshade	18	26.1	4,538	22.2
Cocklebur	12	17.4	1,993	9.7
Biennial wormwood	7	10.1	1,961	9.6
North Dakota				
Kochia	99	58.9	53,495	61.4
Canada thistle	79	47.0	36,010	41.3
Redroot pigweed	56	33.3	31,520	36.2
Nightshade	53	31.6	30,246	34.7
Lambsquarters	39	23.2	21,474	24.6
Biennial wormwood	28	16.7	20,630	23.7
Cocklebur	27	16.1	15,378	17.6
Ragweed	22	13.1	10,837	12.4
Northarvest				
Kochia	117	49.4	61,116	56.8
Redroot pigweed	91	38.4	42,106	40.2
Canada thistle	94	39.7	40,824	37.9
Lambsquarters	81	34.2	34,912	32.4
Nightshade	71	30.0	34,784	32.3
Biennial wormwood	35	14.8	22,591	21.0
Ragweed	52	21.9	21,088	19.6
Cocklebur	39	16.5	17,371	16.1

[a] Ranked as No. 1, 2 or 3 weed problem on more than 10% of respondents' acres.

[b] Respondents' acres only.

Table 11. Weed control practices used on dry edible bean fields in 2006.

Herbicide or other practice*	Acres reported[a]	Acres reported[a]
	(no.)	(%)
Minnesota		
Raptor	13,789	67.5
Cultivation*	10,297	50.4
Rezult	8,771	42.9
Sonalan (spring)	5,666	27.7
Basagran	4,836	23.7
Treflan (spring)	4,372	21.4
Prowl	3,631	17.8
Outlook	3,615	17.7
Reflex	2,794	13.7
Pursuit	1,892	9.3
Rotary Hoe*	1,831	8.9
Assure II	1,259	6.2
Dual	785	3.8
Other	660	3.2
Select	481	2.4
Spartan	440	2.2
Lasso	442	2.2
Treflan (fall)	300	1.5
Poast	290	1.4
Treflan+Eptam	110	0.5
Glyphosate (pre-harvest)	100	0.5
Eptam (spring)	0	0

Table 11 continued in next column

Herbicide or other practice*	Acres reported[a]	Acres reported[a]
	(no.)	(%)
North Dakota		
Rezult	62,350	71.5
Raptor	44,476	51.0
Sonalan (spring)	41,331	47.4
Cultivation*	35,517	40.7
Reflex	18,696	21.4
Select	13,678	15.7
Prowl	11,349	13.0
Pursuit	8,073	9.3
Treflan (spring)	7,320	8.4
Basagran	6,659	7.6
Other	6,334	7.3
Sonalan (fall)	4,734	5.4
Roundup	3,882	4.5
Assure II	3,080	3.5
Glyphosate (pre-harvest)	2,302	2.6
Rotary hoe*	1,605	1.8
Poast	1,425	1.6
Outlook	1,325	1.5
Spartan	635	0.7
Dual	640	0.7
Eptam (fall)	0	0
Eptam (spring)	0	0
Treflan (fall)	0	0
Treflan+Eptam	0	0
None	0	0
Northarvest		
Rezult	71,121	66.1
Raptor	58,265	54.1
Sonalan (spring)	46,997	43.7
Cultivation*	45,814	42.6
Reflex	21,490	19.9
Prowl	14,980	13.9
Select	14,159	13.2
Treflan (spring)	11,692	10.9
Basagran	11,495	10.7
Pursuit	9,965	9.3
Other	6,994	6.5
Outlook	4,940	4.6
Sonalan (fall)	4,734	4.4
Assure II	4,339	4.0
Rotary Hoe*	3,436	3.2
Glyphosate (pre-harvest)	2,402	2.2
Poast	1,715	1.6
Dual	1,425	1.3
Spartan	1,075	1.0
Lasso	442	0.4
Treflan (fall)	300	0.3
Treflan+Eptam	110	0.1
Eptam (spring)	0	0
Eptam (fall)	0	0
None	0	0

[a] Respondents' acres only.

Table 12. Weed control practices used by bean market class in 2006.

Herbicide or other practice*	Black	Kidney	Navy	Pinto
	% acres treated[a]			
Minnesota				
Assure II	0.5	0	4.8	0
Basagran	0	25.0	21.9	0
Cultivation*	12.8	24.5	48.5	36.6
Dual	0	5.7	2.6	0
Eptam (spring)	0	0	0	0
Glyphosate – preharvest	0	0	0	3.9
Lasso	0	3.3	2.1	0
Other	0	4.3	1.6	0
Outlook	0	34.7	2.3	3.1
Poast	0	0	0.6	3.9
Prowl	0	8.9	23.5	0
Pursuit	0	5.2	9.9	16.8
Raptor	4.1	56.0	52.9	19.3
Reflex	21.0	5.9	14.8	0
Rezult	16.4	49.3	25.7	36.5
Rotary hoe*	0	0	9.5	29.1
Select	0	1.9	0	0
Sonalan (spring)	27.3	38.9	12.9	19.3
Spartan	0	4.3	0.9	0
Treflan (fall)	0	3.3	0	0
Treflan (spring)	0	0	22.3	51.7
Treflan + Eptam	0	0	1.6	0
North Dakota				
Assure II	4.3		0	4.5
Basagran	0		2.4	4.5
Cultivation*	20.4		23.4	42.1
Dual	0		2.5	0.4
Glyphosate – preharvest	5.1		1.4	2.8
Other	0		1.0	7.6
Outlook	0		0	1.8
Poast	0		3.3	1.5
Prowl	31.2		26.3	8.8
Pursuit	3.4		9.8	10.2
Raptor	30.1		51.3	44.1
Reflex	5.9		18.9	24.8
Rezult	54.2		49.3	71.1
Rotary hoe*	0		2.0	1.6
Roundup	15.4		1.9	4.3
Select	0		1.0	21.5
Sonalan (fall)	2.6		0	6.9
Sonalan (spring)	22.8		23.8	49.3
Spartan	0		1.9	0.6
Treflan (spring)	1.2		13.1	6.0

[a] % of respondents' acres for that class; includes practices used on more than 10% of respondents' acres for one or more classes.

Table 13. Desiccants used on dry edible bean fields in 2006.

Desiccant	Respondents	Respondents	Acres reported[a]	Acres reported[a]
	(no.)	(%)	(no.)	(%)
Minnesota				
Sodium chlorate	10	14.5	3,062	15.0
Gramoxone Extra	4	5.8	547	2.7
Glyphosate	10	14.5	1,367	6.7
North Dakota				
Sodium chlorate	2	1.2	752	0.9
Gramoxone Extra	26	15.5	6,890	7.9
Aim	3	1.8	670	0.8
Glyphosate	19	11.3	4,422	5.0
Northarvest				
Sodium chlorate	12	5.1	3,814	3.5
Gramoxone Extra	30	12.7	7,437	6.9
Aim	3	1.3	670	0.6
Glyphosate	29	12.2	5,789	5.4

[a] Respondents' acres only.

Table 14. Worst disease problem on dry edible bean in 2006.

Disease[a]	Respondents	Respondents	Acres reported[b]	Acres reported[b]
	(no.)	(%)	(no.)	(%)
Minnesota				
Root rot	13	19.1	5,823	28.5
None	21	30.9	5,569	27.2
White mold	26	38.2	5,210	25.5
Bacterial blight	6	8.8	1,891	9.3
Anthracnose	1	1.5	1,100	5.4
Rust	1	1.5	850	4.2
Total	**68**	**100.0**	**20,443**	**100.0**
North Dakota				
None	70	47.6	33,383	38.3
White mold	48	32.7	27,949	32.1
Bacterial blight	19	12.9	11,600	13.3
Root rot	4	2.7	1,949	2.2
Rust	4	2.7	765	0.9
Anthracnose	2	1.4	500	0.6
Alternaria	0	0	0	0
Total	**147**	**100.0**	**76,146**	**87.3**
Northarvest				
None	91	42.3	38,952	36.2
White mold	74	34.4	33,159	30.8
Bacterial blight	25	11.6	13,491	12.5
Root rot	17	7.9	7,772	7.2
Anthracnose	3	1.4	1,600	1.5
Rust	5	2.3	1,615	1.5
Alternaria	0	0.0	0	0
Total	**215**	**100.0**	**96,589**	**89.7**

[a] Ranked as No. 1 disease problem by respondents.

[b] Respondents' acres only.

Table 15. Diseases ranked as one of the three worst on dry edible bean in 2006.

Disease[a]	Respondents	Respondents	Acres reported[b]	Acres reported[b]
	(no.)	(%)	(no.)	(%)
Minnesota				
White mold	41	59.4	11,657	57.0
Root rot	29	42.0	10,602	51.9
Bacterial blight	22	31.9	7,412	36.3
None	23	33.3	5,769	28.2
Rust	8	11.6	4,862	23.8
Anthracnose	9	13.0	3,730	18.2
Viruses	1	1.4	305	1.5
Mosaic virus	1	1.4	91	0.4
Alternaria	0	0	0	0
North Dakota				
White mold	66	39.3	35,755	41.0
None	72	42.9	34,372	39.4
Bacterial blight	43	25.6	27,039	31.0
Root rot	23	13.7	12,459	14.3
Rust	27	16.1	11,736	13.5
Alternaria	4	2.4	2,378	2.7
Anthracnose	5	2.9	2,020	2.3
Viruses	2	1.2	948	1.1
Mosaic virus	2	1.2	860	0.9
Northarvest				
White mold	107	45.1	47,412	44.1
None	95	40.1	40,141	37.3
Bacterial blight	65	27.4	34,451	32.0
Root rot	52	21.9	23,061	21.4
Rust	35	14.8	16,598	15.4
Anthracnose	14	5.9	5,750	5.3
Alternaria	4	1.7	2,378	2.2
Viruses	3	1.3	1,253	1.2
Mosaic virus	3	1.3	951	0.9

[a] Ranked as No. 1, 2 or 3 disease problem by respondents.

[b] Respondents' acres only.

Table 16. Fungicides applied to dry edible bean fields in 2006.

Fungicide	Acres treated[a]	Acres treated[a]	Acres treated by air[a]	Acres treated by air[a]	Acres treated by ground[a]	Acres treated by ground[a]
	(no.)	(%)	(no.)	(%)	(no.)	(%)
Minnesota						
Topsin (broadcast)	2,107	10.3	462	21.9	1,645	78.1
Headline	1,800	8.8	0	0	1,800	100
Topsin (banded)	640	3.1	0	0	440	68.8
Tilt	290	1.4	0	0	290	100
Other	155	0.8	0	0	155	100
Total	**4,992**	**24.4**	**462**	**9.3**	**4,330**	**86.7**
North Dakota						
Topsin (broadcast)	8,023	9.2	2,800	34.9	4,773	59.5
Headline	7,251	8.3	325	4.5	6,476	89.3
Topsin (banded)	1,075	1.2	0	0	1,075	100
Bravo	40	<0.1	0	0	40	100
Tilt	20	<0.1	20	100	0	0
Total	**16,409**	**18.8**	**3,125**	**19.0**	**12,364**	**75.4**
Northarvest						
Topsin (broadcast)	10,130	9.4	3,262	32.2	6,418	63.4
Headline	9,051	8.4	325	3.6	8,276	91.4
Topsin (banded)	1,715	2.0	0	0	1,515	88.3
Tilt	310	<0.1	20	6.5	290	93.6
Other	155	0.8	0	0	155	100
Bravo	40	<0.1	0	0	40	100
Total	**21,401**	**20.0**	**3,607**	**16.9**	**16,694**	**78.0**

[a] Respondents' acres only. Some respondents did not indicate application method; therefore, ground-applied acres and air-applied acres may not always equal total acres treated.

Table 17. Use of fungicide seed treatment on dry edible bean in 2006.

	Respondents	Respondents
	(no.)	(%)
Minnesota		
Treatment used	18	29.5
Treatment not used	43	70.5
North Dakota		
Treatment used	62	44.6
Treatment not used	77	55.4
Northarvest		
Treatment used	80	40.0
Treatment not used	120	60.0

Table 18. Worst insect problem on dry edible bean in 2006.

Insect[a]	Respon-dents	Respon dents	Acres reported[a]	Acres reported[a]
	(no.)	(%)	(no.)	(%)
Minnesota				
Leafhopper	34	51.5	9,652	47.2
None	21	31.8	5,336	26.1
Other *(aphids, cutworms)*	6	9.1	3,242	15.9
Seed corn maggot	4	6.1	1,273	6.2
Grasshopper	1	1.5	550	2.7
Spider mite	0	0	0	0
Total	**66**	**100.0**	**20,053**	**98.1**
North Dakota				
None	63	53.8	28,004	32.1
Other *(aphids, cutworms, bean leaf beetle, caterpillar)*	17	14.5	14,226	16.3
Leafhopper	20	17.1	8,478	9.7
Grasshopper	14	12.0	6,625	7.6
Spider mite	2	1.7	1,440	1.7
Seed corn maggot	1	0.9	1,084	1.2
Total	**117**	**100.0**	**59,857**	**68.6**
Northarvest				
None	84	45.9	33,340	31.0
Leafhopper	54	29.5	18,130	16.9
Other	23	12.6	17,468	16.2
Grasshopper	15	8.2	7,175	6.7
Seed corn maggot	5	2.7	2,357	2.2
Spider mite	2	1.1	1,440	1.3
Total	**183**	**100.0**	**79,910**	**74.3**

[a] Respondents' acres only.

Table 19. Insects ranked as one of the three worst in dry edible bean fields in 2006.

Insect[a]	Respon-dents	Respon-dents	Acres reported[b]	Acres reported[b]
	(no.)	(%)	(no.)	(%)
Minnesota				
Leafhopper	40	58.0	13,294	65.0
Other	33	47.8	12,466	61.0
Spider mite	6	8.7	2,487	12.2
Seed corn maggot	6	8.7	2,288	11.2
Grasshopper	8	11.6	2,047	10.0
North Dakota				
Other	42	25.0	31,193	35.8
Grasshopper	31	18.5	18,394	21.1
Leafhopper	28	16.7	13,299	15.3
Seed corn maggot	6	3.6	6,297	7.2
Spider mite	8	4.8	4,129	4.7
Northarvest				
Other	75	31.7	43,659	40.6
Leafhopper	68	28.7	26,593	24.7
Grasshopper	39	16.5	20,441	19.0
Seed corn maggot	12	5.1	8,585	8.0
Spider mite	14	6.0	6,616	6.1

[a] Ranked as No. 1, 2 or 3 insect problem by respondents.
[b] Respondents' acres only.

Table 20. Use of insecticides on dry edible bean fields in 2006.

Insecticide	Respon-dents	Respon-dents	Acres reported[a]	Acres reported[a]
	(no.)	(%)	(no.)	(%)
Minnesota				
Asana XL	17	24.6	3,116	15.2
Dimethoate	7	10.1	1,952	9.6
Warrior	1	1.4	825	4.0
Mustang	1	1.4	80	0.4
North Dakota				
Asana XL	9	5.4	2,732	3.1
Other	1	1.0	2,500	2.9
Warrior	2	1.2	893	1.0
Dimethoate	1	1.0	67	0.1
Northarvest				
Asana	26	11.0	5,848	5.4
Other	1	<0.1	2,500	2.3
Dimethoate	8	3.3	2,019	1.9
Warrior	3	1.3	1,718	1.6
Mustang	1	<0.1	80	<0.1

[a] Respondents' acres only.

Table 21. Use of insecticide seed treatment on dry edible bean in 2006.

Treatment	Respon-dents	Respon-dents	Acres reported[a]	Acres reported[a]
	(no.)	(%)	(no.)	(%)
Minnesota				
Lorsban	16	23.2	4,008	19.6
Cruiser	9	13.0	1,805	8.8
Gaucho	1	1.4	150	1.0
North Dakota				
Lorsban	25	14.9	12,604	14.5
Cruiser	4	2.4	3,775	4.3
Gaucho	1	1.0	185	<0.1
Northarvest				
Lorsban	41	17.3	16,612	15.4
Cruiser	13	5.5	5,580	5.2
Gaucho	2	1.0	335	<0.1

[a] Respondents' acres only.

Table 22. Use of fertilizers on dry edible bean fields in 2006.

Fertilizer	Respondents	Average amount applied
	(%)	(lb/A)
Minnesota		
Nitrogen	81.2	68.3
Phosphate	63.8	32.9
Potash	55.1	50.6
Zinc	37.7	5.1
Other	5.8	16.3
North Dakota		
Nitrogen	72.6	44.8
Phosphate	65.5	39.2
Potash	14.3	26.1
Zinc	31.6	4.9
Other	1.8	7.0

Table 23. Use of Rhizobium inoculants on dry edible bean in 2006.

Rhizobium use	Respondents	Respondents
	(no.)	(%)
Minnesota		
Inoculant used	12	19.4
Inoculant not used	50	80.6
North Dakota		
Inoculant used	24	17.4
Inoculant not used	114	82.6
Northarvest		
Inoculant used	36	18.0
Inoculant not used	164	82.0

Table 24. Use of soil test prior to fertilization of dry edible bean fields in 2006.

Soil test	Respondents	Respondents
	(no.)	(%)
Minnesota		
Soil test used	58	85.3
Soil test not used	10	14.7
North Dakota		
Soil test used	122	79.7
Soil test not used	31	20.3
Northarvest		
Soil test used	180	81.4
Soil test not used	41	18.6

Table 25. Crop grown the year prior to dry edible bean in 2006.

Previous crop	Respondents
	(%)
Minnesota	
Corn	38.5
Wheat	31.7
Sugar beet	21.2
Potato	1.0
Barley	2.9
Oats	
Other (alfalfa, soybean, other)	4.8
North Dakota	
Wheat	67.7
Corn	10.8
Barley	8.7
Sugar beet	10.1
Other (oats, alfalfa, other)	1.1
Potato	1.4
Fallow	0.4
Flax	

Table 26. Number of years in dry bean rotation in 2006.

Number of years	Respondents
	(%)
Minnesota	
1	1.0
2	14.3
3	11.4
4	30.5
5	42.9
North Dakota	
1	0.4
2	33.6
3	26.6
4	20.4
5	19.0

Other Responses

The following "other" responses were recorded; the number of responses are in parentheses next to the response.

Other dry bean class:
small red (6); yellow enoba (1)

Other navy cultivar:
Regent (4); Premeire (4); Cirrus (7); Envoy (3); Schooner (1); Upland (1); Gran Mesa (1); TT9905 (1)

Other pinto cultivar:
Pintoba (2); Ameriseed 99236 (6); Othello (3); Fargo (2); Nodak (1); Bill Z (1); Arapahoe (1); Pintium (1)

Other black cultivar:
Shiny Crow (3); Harblack (2); Expresso (1); Rog312 (2)

Other kidney cultivar:
Cabernet (1); Foxfire (1); Beluga Wht (1); VC Nichols (1); Cal. Early (3); Chinook (1); Sacramento light red (1)

Other worst weed:
milkweed (1); smartweed (5); sage (1); marshelder (2); cheatgrass (1); tansy mustard (1); velvetleaf (1); waterhemp (5)

Other fertilizer:
sulfur (12); calcium (4)

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APPENDIX I.

Please circle or fill in the requested information on pest problems and pesticide use on your 2006 dry bean crop.

Total dry bean acres planted in 2006	
Total irrigated acres	
Total dry bean acres harvested	
Dry bean acres with hail damage	
Dry bean acres with frost damage	
Dry bean acres with water damage	

State	County	Acres
Minnesota		
North Dakota		
South Dakota		

Dry Beans Grown		
Class	**Variety**	**Acres**
Pinto	1 Buster	
	2 GTS 900	
	3 Maverick	
	4 AC Pintoba	
	5 Remington	
	6 Winchester	
	7 Other Pinto (specify)	
Navy	21 Arthur	
	22 Mayflower	
	23 Navigator	
	24 Norstar	
	25 Vista	
	26 Voyager	
	27 Other Navy (specify)	
Kidney	41 Montcalm (DRK)	
	42 Red Hawk	
	43 Other Kidney (specify)	
Black	61 Onyx	
	62 Jaguar	
	63 T-39	
	64 Eclipse	
	65 Other Black (specify)	
Pink	81 (specify)	
Other	91 (specify class & variety)	

Seed Source	Acres Planted
Western grown	
Northarvest grown (ND/MN)	
Canadian grown	
Bin run	

Crop Rotation (field with dry beans in 2006) (write in crops grown in previous years)		
	Field #1 dry beans '06	**Field #2 dry beans '06**
2005		
2004		
2003		
2002		

Biggest Production Problem in Dry Beans (circle one & complete table)		
	Acres Affected	Bean Class
1 Applied herbicide injury*		
2 *List herbicide in #1		
3 Herbicide drift injury		
4 Delayed planting		
5 Emergence/stand		
6 Harvest		
7 Disease		
8 Insects		
9 Micronutrient deficiency		
10 Weeds		
11 Other (specify)		
12 None		

Insecticides Used on Dry Beans		
Insecticide (write in name or #)	**No. Acres Treated**	**No. of Sprays**
Dry Bean Insecticides	1 Asana XL 2 Capture 3 Carbaryl (Sevin) 4 Acephate (Orthene, Address) 5 Baythroid XL 6 Tombstone 7 Malathion 8 Warrior 9 Lannate LV	10 Mustang Max 11 Penncap-M 12 SpinTor 13 Proaxis 14 Dimethoate 15 Dipel 16 Nuprid 17 Thimet 20G 18 Endosulfan
Was insecticide-treated seed used? Yes No		
If so, what product(s)?		
Acres planted Cruiser 5FS or Cruiser MAXX Beans Seed Treatment		
Acres planted Lorsban Seed Treatment		
Acres planted Gaucho Seed Treatment		

Worst Insect/Mite Problem (Rank 1-3; 1 = worst) ONLY mark 3	
Aphids	
Cutworms	
Bean leaf beetle	
Caterpillars	
Grasshoppers	
Leafhoppers	
Spider mites	
Seedcorn maggot	

Worst Weed Problems in Dry Beans (Rank 1-3; 1 = worst) ONLY mark 3			
Biennial wormwood		Nightshade	
Canada thistle		Ragweed	
Cocklebur		Redroot pigweed	
Foxtail		Volunteer grain	
Kochia		Wild oat	
Lambsquarters		Other	

Weed Control Practices Used on Dry Beans
Mark weed control used and indicate areas treated for each item. Count double application, double cultivation, etc., as double acres.

Weed Control Used (Write in name or #)	Class of Bean	Acres Treated	Class of Bean (If additional)	Acres Treated	Class of Bean (If additional)	Acres Treated

Dry Bean Herbicide			
	1 Assure II 2 Basagran/generics 3 Dual 4 Eptam (fall) 5 Eptam (spring) 6 Lasso/generics 7 Outlook 8 Poast 9 Prowl	10 Pursuit 11 Raptor 12 Reflex 13 Roundup Ultra (preplant) 14 Rezult 15 Select 16 Sonalan (fall) 17 Sonalan (spring) 18 Spartan	19 Trifluralin (fall) 20 Triflurallin (spring) 21 Trifluralin + Eptam (spring) 22 No Herbicide 23 Cultivation 24 Rotary hoe 25 Glyphosate (pre harvest) 26 Other

Desiccants	Class of Bean	Acres Treated	Class of Bean (if additional)	Acres Treated	Class of Bean (If additional)	Acres Treated
Sodium Chlorate (Leafex, Defol)						
Gramoxone Extra						
Aim						
Glyphosate						

General Fertilizer Program for Dry Beans lb/A applied				
Nitrogen	Phosphate	Potash	Zinc	Other
Inoculate with rhizobium bacteria?				
Soil test prior to fertilization?				

Worst Disease Problems (Rank 1-3; 1 = worst) ONLY mark 3	Alternaria	Anthracnose	Bacterial Blight	Root Rot	Rust	White Mold	None
	Viruses - General	Bean Common Mosaic Virus					

Fungicides Used on Dry Beans				
Fungicide Used (write in name or #)	No. Acres Treated	No. of Sprays	Application Method (circle one)	
			air	ground
			air	ground
			air	ground
			air	ground
			air	ground
			air	ground
			air	ground
			air	ground

Dry Bean Fungicides		
	1 Bravo/ generics 2 Champion/Champ 3 Endura 4 Headline 5 Intercept 6 Kocide 7 Maneb	8 Thiolux 9 Tilt 10 Topsin/generics (broadcast) 11 Topsin/generics (banded) 12 Quadris/Amistar 13 Other 14 Any tank mixes? List combination

Was fungicide-treated seed used?	Yes	No
If so, what product(s)?		

What is your opinion on the importance of "plant architecture" to dry bean production? 1-3: 1 = low importance, 2 = moderate importance, 3 = very important

What is your opinion on the importance of "plant architecture" to direct combining? 1-3: 1 = low importance, 2 = moderate importance, 3 = very important

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