E1750

2014 DRY BEAN Grower Survey

of Production, Pest Problems and Pesticide Use

in Minnesota and North Dakota

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North Dakota State University

In cooperation with the Northarvest Bean Growers Association

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Introduction

The 2014 dry bean grower survey is the 25th annual review 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 form (Appendix I). The survey was mailed to all Northarvest bean growers. All participants in the survey were anonymous.

Results of previous surveys dated 1987-1992, 1994-2000, 2002 and 2004-2013 have been published (see References). 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.

Data reported in the figures represent totals for the entire Northarvest survey unless otherwise noted. Data reported in the tables are broken down by state and also are totaled for the entire Northarvest survey. Percent values in tables and figures are rounded to one decimal for clear presentation. Consequently, percent values in some tables and figures may not total exactly 100 percent (for example, 99.9 or 100.1 percent) when the presented values are added. Other instances where percent values do not total 100 percent are explained in footnotes to the tables.

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.

Acknowledgments

A grant from the Northarvest Bean Growers Association funded the survey.

Cover photos by J.J. Knodel and J.M. Osorno

Production

Table 1. Number of Northarvest dry bean growers responding, acres planted by respondents and total state acres in 2014.

Growers	No. of respondents	Respondents' acres	Total acres[a]	Acres surveyed (% of total)
Minnesota	65	35,228	155,000	22.7
North Dakota	106	68,312	630,000	10.8
Northarvest	171	103,540	785,000	13.2

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

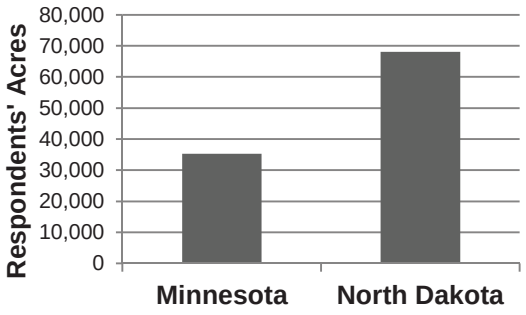


Figure 1. Northarvest dry bean acres planted by state in 2014 (respondents' acres only).

Table 2. Dry bean production by county in 2014.

Minnesota	No. of respon-dents[a]	Acres[b]	North Dakota	No. of respon-dents[a]	Acres[b]
Polk	13	7,090	Grand Forks	17	12,549
Otter Tail	6	3,445	Walsh	25	9,456
Hubbard	2	3,156	Pembina	18	8,434
Norman	1	3,000	Steele	13	7,015
Renville	11	2,353	Wells	7	5,930
Benton	2	1,795	Benson	7	3,432
Mahnomen	4	1,755	McLean	4	3,010
Wadena	3	1,512	Ramsey	3	2,162
Stearns	2	1,467	Nelson	1	1,800
Marshall	3	1,436	Traill	4	1,750
Chippewa	4	1,259	Cavalier	2	1,601
Becker	1	1,000	LaMoure	2	1,600
Swift	3	915	Barnes	4	1,201
Traverse	2	755	Griggs	2	1,150
Morrison	3	660	Stutsman	2	903
Clay	2	560	Pierce	2	850
Kandiyohi	4	560	Burleigh	1	800
Pennington	1	360	Towner	1	800
Meeker	1	350	Cass	2	785
Stevens	1	350	Ransom	2	707
Crow Wing	1	305	Richland	2	550
Pope	1	260	Mercer	1	487
Sherburne	1	205	McHenry	1	450
Grant	1	200	Oliver	1	400
Lac qui Parle	1	150	Sargent	2	200
Todd	1	150	Morton	1	130
Wilkin	1	100	Eddy	1	85
Douglas	1	80	Foster	1	75
Total	**77**	**35,228**	**Total**	**129**	**68,312**

[a]Some respondents had dry bean acreage in more than one county.
[b]Respondents' acres only.

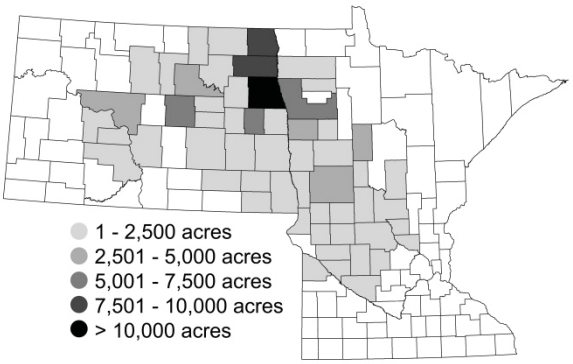


Figure 2. Northarvest dry bean production by county in 2014 (respondents' acres only).

Table 3. Dry bean acres harvested, irrigated, on tile-drained ground, and damaged by hail, frost and water in 2014.

	Acres reported (no.)[a]	Acres reported (%)[a]
Minnesota		
Harvested	33,803	96.0
Irrigated	14,397	40.9
Tile-drained	7,264	20.6
Hail-damaged	3,517	10.0
Frost-damaged	2,869	8.1
Water-damaged	9,496	27.0
North Dakota		
Harvested	66,580	97.8
Irrigated	509	0.7
Tile-drained	2,585	3.8
Hail-damaged	5,741	8.4
Frost-damaged	3,086	4.5
Water-damaged	19,897	29.2
Northarvest		
Harvested	100,383	97.2
Irrigated	14,906	14.4
Tile-drained	9,849	9.5
Hail-damaged	9,258	9.0
Frost-damaged	5,955	5.8
Water-damaged	29,393	28.5

[a]Respondents' acres only.

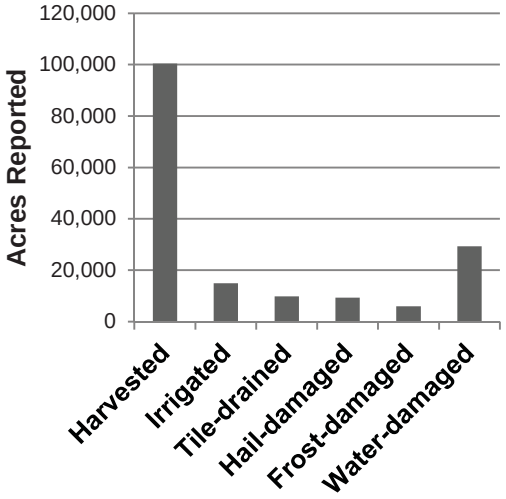


Figure 3. Northarvest respondents' reported acres from Table 3.

Table 4. Dry bean market classes grown in 2014.

Market class	Acres reported (no.)[a]	Acres reported (%)[a]
Minnesota		
Kidney	19,210	54.5
Navy	8,716	24.7
Black	4,135	11.7
Pinto	1,397	4
Pink	1,280	3.6
Cranberry	490	1.4
Total	**35,228**	**100**
North Dakota		
Pinto	43,880	64.2
Navy	12,247	17.9
Black	8,045	11.8
GN	2,810	4.1
Kidney	550	0.8
Pink	354	0.5
Small Red	281	0.4
Cranberry	145	0.2
Total	**68,312**	**100**
Northarvest		
Pinto	45,277	43.7
Navy	20,963	20.2
Kidney	19,760	19.1
Black	12,180	11.8
GN	2,810	2.7
Pink	1,634	1.6
Cranberry	635	0.6
Small Red	281	0.3
Total	**103,540**	**100**

[a]Respondents' acres only.

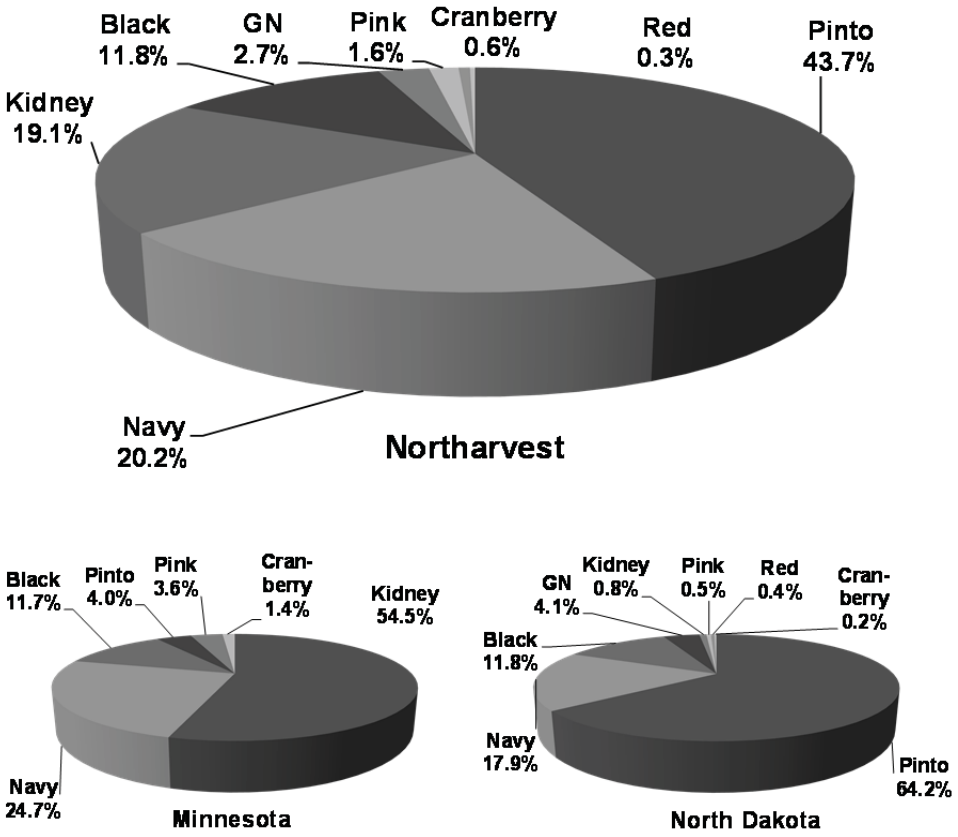
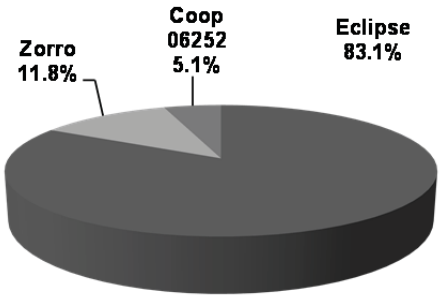


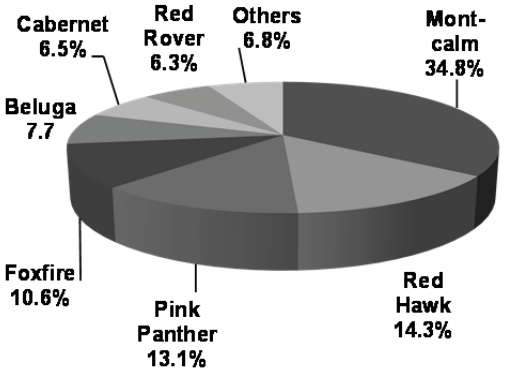
Figure 4. Northarvest dry bean market classes grown in 2014.

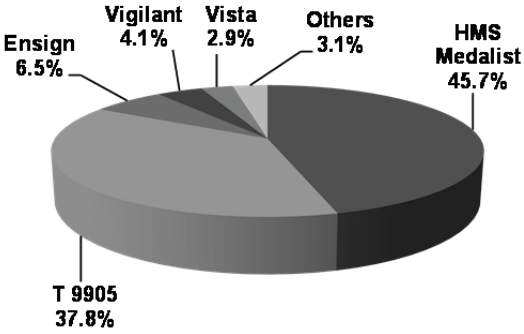
Table 5. Dry bean varieties grown in 2014.

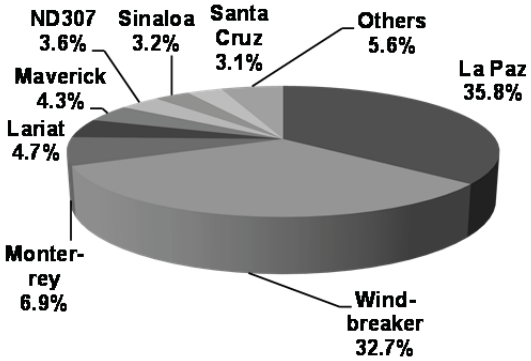
		Acres planted[a]					
Variety	Class	Minnesota	%[b]	North Dakota	%[b]	Northarvest	%[b]
Eclipse	Black	3,110	8.8	7,008	10.3	10,118	9.8
Zorro	Black	400	1.1	1,037	1.5	1,437	1.4
Coop 06252	Black	625	1.8	0	0	625	0.6
Total Black	**Black**	**4,135**	**11.7**	**8,045**	**11.8**	**12,180**	**11.8**
Hooter	Cranberry	450	1.3	0	0	450	0.4
Not specified	Cranberry	40	0.1	145	0.2	185	0.2
Total Cranberry	**Cranberry**	**490**	**1.4**	**145**	**0.2**	**635**	**0.6**
Aries	GN	0	0	1,110	1.6	1,110	1.1
Taurus	GN	0	0	800	1.2	800	0.8
Orion	GN	0	0	700	1	700	0.7
Not specified	GN	0	0	200	0.3	200	0.2
Total GN[c]	**GN[c]**	**0**	**0**	**2,810**	**4.1**	**2,810**	**2.7**
Montcalm	Kidney	6,756	19.2	124	0.2	6,880	6.6
Red Hawk	Kidney	2,640	7.5	176	0.3	2,816	2.7
Pink Panther	Kidney	2,595	7.4	0	0	2,595	2.5
Foxfire	Kidney	2,104	6	0	0	2,104	2
Beluga	Kidney	1,262	3.6	250	0.4	1,512	1.5
Cabernet	Kidney	1,277	3.6	0	0	1,277	1.2
Red Rover	Kidney	1,241	3.5	0	0	1,241	1.2
CELRK	Kidney	750	2.1	0	0	750	0.7
Clouseau	Kidney	485	1.4	0	0	485	0.5
T 85	Kidney	100	0.3	0	0	100	0.1
Total Kidney	**Kidney**	**19,210**	**54.5**	**550**	**0.8**	**19,760**	**19.1**
HMS Medalist	Navy	2,802	8	6,769	9.9	9,571	9.2
T 9905	Navy	4,199	11.9	3,716	5.4	7,915	7.6
Ensign	Navy	250	0.7	1,115	1.6	1,365	1.3
Vigilant	Navy	757	2.1	100	0.1	857	0.8
Vista	Navy	598	1.7	0	0	598	0.6
Avalanche	Navy	60	0.2	143	0.2	203	0.2
T 9903	Navy	0	0	181	0.3	181	0.2
Norstar	Navy	0	0	103	0.2	103	0.1
Indi	Navy	0	0	100	0.1	100	0.1
Merlin	Navy	50	0.1	0	0	50	0
Teton	Navy	0	0	20	0	20	0
Total Navy	**Navy**	**8,716**	**24.7**	**12,247**	**17.9**	**20,963**	**20.2**
Floyd	Pink	300	0.9	334	0.5	634	0.6
Rosetta	Pink	600	1.7	20	0	620	0.6
ROG 922	Pink	380	1.1	0	0	380	0.4
Total Pink	**Pink**	**1,280**	**3.6**	**354**	**0.5**	**1,634**	**1.6**
La Paz	Pinto	154	0.4	16,066	23.5	16,220	15.7
Windbreaker	Pinto	1,113	3.2	13,695	20	14,808	14.3
Monterrey	Pinto	0	0	3,142	4.6	3,142	3
Lariat	Pinto	40	0.1	2,077	3	2,117	2
Maverick	Pinto	0	0	1,928	2.8	1,928	1.9
ND307	Pinto	0	0	1,650	2.4	1,650	1.6
Sinaloa	Pinto	0	0	1,450	2.1	1,450	1.4
Santa Cruz	Pinto	90	0.3	1,331	1.9	1,421	1.4
Stampede	Pinto	0	0	1,220	1.8	1,220	1.2
Not specified	Pinto	0	0	500	0.7	500	0.5
Medicine Hat	Pinto	0	0	273	0.4	273	0.3
Sequoia	Pinto	0	0	240	0.4	240	0.2
Buster	Pinto	0	0	200	0.3	200	0.2
AS 06206	Pinto	0	0	83	0.1	83	0.1
Eldorado	Pinto	0	0	25	0	25	0
Total Pinto	**Pinto**	**1,397**	**4**	**43,880**	**64.2**	**45,277**	**43.7**
Merlot	Red	0	0	200	0.3	200	0.2
Rio Rojo	Red	0	0	75	0.1	75	0.1
Ruby	Red	0	0	6	0	6	0
Total Red	**Red**	**0**	**0**	**281**	**0.4**	**281**	**0.3**
Grand Total	**All Classes**	**35,228**	**100**	**68,312**	**100**	**103,540**	**100**

[a]Respondents' acres only.
[b]Percent of respondents' total dry bean acreage.
[c]GN = Great Northern.









Figures 5 to 8 (from top to bottom): major black, kidney, navy and pinto varieties grown by Northarvest survey respondents in 2014 (% acreage for class).

Table 6. Dry bean production problems reported in 2014.

Worst production problem	Respondents (no.)	Respondents (%)	Acres reported (no.)[a]	Acres reported (%)[a]
Minnesota				
Excess water	50	76.9	9,496	27.0
Diseases	18	27.7	7,355	20.9
Emergence/stand	20	30.8	4,498	12.8
Delayed planting	16	24.6	4,010	11.4
Weeds	21	32.3	3,601	10.2
Hail	13	20.0	3,517	10.0
Frost	11	16.9	2,869	8.1
Drought	6	9.2	1,637	4.6
Harvest	9	13.8	1,377	3.9
None reported	2	3.1	900	2.6
Applied herbicide injury	7	10.8	765	2.2
Insects	1	1.5	155	0.4
Micronutrient deficiency	1	1.5	155	0.4
Soil salinity	1	1.5	40	0.1
North Dakota				
Excess water	76	71.7	19,897	29.2
Diseases	31	29.2	14,209	20.9
Weeds	29	27.4	13,010	19.1
Delayed planting	30	28.3	12,818	18.8
Drought	15	14.2	7,115	10.4
Hail	24	22.6	5,741	8.4
Emergence/stand	24	22.6	5,701	8.4
Soil salinity	31	29.2	3,877	5.7
Frost	20	18.9	3,086	4.5
None reported	11	10.4	2,914	4.3
Harvest	12	11.3	2,332	3.4
Applied herbicide injury	5	4.7	1,217	1.8
Micronutrient deficiency	3	2.8	450	0.7
Northarvest				
Excess water	126	73.7	29,393	28.5
Diseases	49	28.7	21,564	20.9
Delayed planting	46	26.9	16,828	16.3
Weeds	50	29.2	16,611	16.1
Emergence/stand	44	25.7	10,199	9.9
Hail	37	21.6	9,258	9.0
Drought	21	12.3	8,752	8.5
Frost	31	18.1	5,955	5.8
Soil salinity	32	18.7	3,917	3.8
None reported	13	7.6	3,814	3.7
Harvest	21	12.3	3,709	3.6
Applied herbicide injury	12	7.0	1,982	1.9
Micronutrient deficiency	4	2.3	605	0.6
Insects	1	0.6	155	0.2

[a]Respondents' acres only.

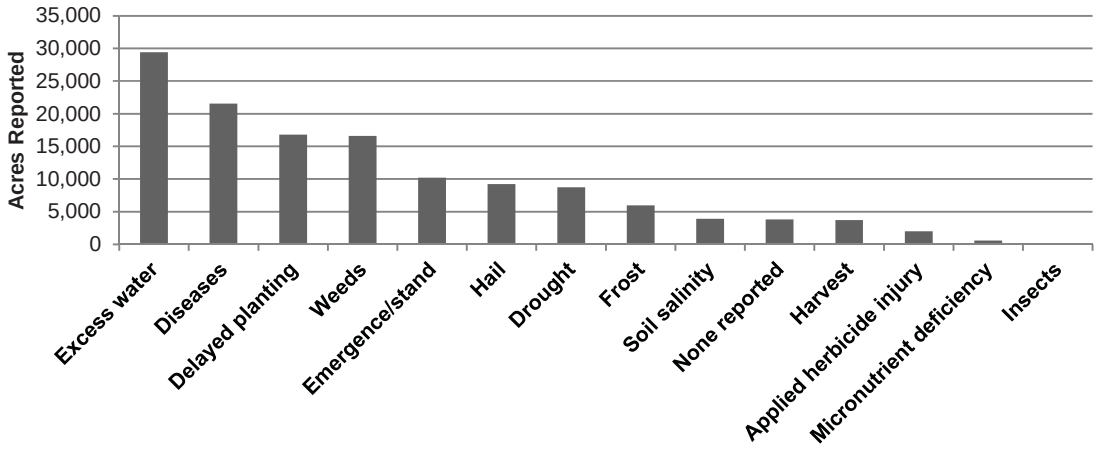


Figure 9. Northarvest respondents' reported acres for dry bean production problems in 2014.

Table 7. Row spacing by dry bean market class in 2014.

	Black[a]		Cranberry		GN[b]		Kidney		Navy[a]		Pink		Pinto[a]		Red	
Row spacing	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Minnesota																
< 11 inches	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 to 15 inches	1	7.1	0	0	0	0	0	0	2	6.5	0	0	0	0	0	0
16 to 20 inches	1	7.1	1	50	0	0	1	4.5	4	12.9	0	0	0	0	1	50
21 to 25 inches	12	85.7	1	50	0	0	9	40.9	22	71	2	66.7	2	50	1	50
26 to 30 inches	0	0	0	0	0	0	11	50	3	9.7	1	33.3	2	50	0	0
> 30 inches	0	0	0	0	0	0	1	4.5	0	0	0	0	0	0	0	0
Total	**14**	**100**	**2**	**100**	**0**	**0**	**22**	**100**	**31**	**100**	**3**	**100**	**4**	**100**	**2**	**100**
North Dakota																
< 11 inches	3	15	1	50	0	0	0	0	0	0	0	0	2	2.6	1	25
11 to 15 inches	3	15	0	0	1	14.3	0	0	1	4.3	0	0	8	10.3	0	0
16 to 20 inches	1	5	0	0	0	0	0	0	3	13	0	0	2	2.6	0	0
21 to 25 inches	6	30	1	50	1	14.3	1	33.3	11	47.8	1	50	24	30.8	2	50
26 to 30 inches	7	35	0	0	5	71.4	2	66.7	8	34.8	1	50	39	50	1	25
> 30 inches	0	0	0	0	0	0	0	0	0	0	0	0	3	3.8	0	0
Total	**20**	**100**	**2**	**100**	**7**	**100**	**3**	**100**	**23**	**100**	**2**	**100**	**78**	**100**	**4**	**100**
Northarvest																
< 11 inches	3	8.8	1	25	0	0	0	0	0	0	0	0	2	2.4	1	16.7
11 to 15 inches	4	11.8	0	0	1	14.3	0	0	3	5.6	0	0	8	9.8	0	0
16 to 20 inches	2	5.9	1	25	0	0	1	4	7	13	0	0	2	2.4	1	16.7
21 to 25 inches	18	52.9	2	50	1	14.3	10	40	33	61.1	3	60	26	31.7	3	50
26 to 30 inches	7	20.6	0	0	5	71.4	13	52	11	20.4	2	40	41	50	1	16.7
> 30 inches	0	0	0	0	0	0	1	4	0	0	0	0	3	3.7	0	0
Total	**34**	**100**	**4**	**100**	**7**	**100**	**25**	**100**	**54**	**100**	**5**	**100**	**82**	**100**	**6**	**100**

[a]Black, navy and pinto varieties are typically Type II (upright) varieties.
[b]GN = Great Northern.

Table 8. Seeding rate by dry bean market class in 2014.

	Black[b]		Cranberry		GN[c]		Kidney		Navy[b]		Pink		Pinto[b]		Red	
Seeding rate[a]	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Minnesota																
< 70,000	0	0	1	50	0	0	0	0	0	0	0	0	1	25	0	0
70 to 79,000	0	0	0	0	0	0	10	45.5	0	0	1	33.3	1	25	0	0
80 to 89,000	0	0	1	50	0	0	11	50	0	0	1	33.3	2	50	0	0
90 to 99,000	2	18.2	0	0	0	0	0	0	2	6.9	1	33.3	0	0	0	0
100 to 109,000	2	18.2	0	0	0	0	0	0	4	13.8	0	0	0	0	0	0
110 to 119,000	3	27.3	0	0	0	0	0	0	6	20.7	0	0	0	0	0	0
120 to 129,000	3	27.3	0	0	0	0	0	0	14	48.3	0	0	0	0	0	0
> 129,000	1	9.1	0	0	0	0	1	4.5	3	10.3	0	0	0	0	0	0
Total	**11**	**100**	**2**	**100**	**0**	**0**	**22**	**100**	**29**	**100**	**3**	**100**	**4**	**100**	**0**	**0**
North Dakota																
< 70,000	0	0	0	0	0	0	0	0	0	0	1	50	19	26.8	1	50
70 to 79,000	0	0	0	0	6	85.7	2	66.7	0	0	1	50	29	40.8	0	0
80 to 89,000	2	11.8	1	50	1	14.3	0	0	1	5.3	0	0	19	26.8	1	50
90 to 99,000	5	29.4	0	0	0	0	1	33.3	5	26.3	0	0	1	1.4	0	0
100 to 109,000	3	17.6	1	50	0	0	0	0	5	26.3	0	0	1	1.4	0	0
110 to 119,000	3	17.6	0	0	0	0	0	0	4	21.1	0	0	1	1.4		0
120 to 129,000	1	5.9	0	0	0	0	0	0	3	15.8	0	0	1	1.4	0	0
> 129,000	3	17.6	0	0	0	0	0	0	1	5.3	0	0	0	0	0	0
Total	**17**	**100**	**2**	**100**	**7**	**100**	**3**	**100**	**19**	**100**	**2**	**100**	**71**	**100**	**2**	**100**
Northarvest																
< 70,000	0	0	1	25	0	0	0	0	0	0	1	20	20	26.7	1	50
70 to 79,000	0	0	0	0	6	85.7	12	48	0	0	2	40	30	40	0	0
80 to 89,000	2	7.1	2	50	1	14.3	11	44	1	2.1	1	20	21	28	1	50
90 to 99,000	7	25	0	0	0	0	1	4	7	14.6	1	20	1	1.3	0	0
100 to 109,000	5	17.9	1	25	0	0	0	0	9	18.8	0	0	1	1.3	0	0
110 to 119,000	6	21.4	0	0	0	0	0	0	10	20.8	0	0	1	1.3	0	0
120 to 129,000	4	14.3	0	0	0	0	0	0	17	35.4	0	0	1	1.3	0	0
> 129,000	4	14.3	0	0	0	0	1	4	4	8.3	0	0	0	0	0	0
Total	**28**	**100**	**4**	**100**	**7**	**100**	**25**	**100**	**48**	**100**	**5**	**100**	**75**	**100**	**2**	**100**

[a]Live seeds per acre.
[b]Black, navy and pinto varieties are typically Type II (upright) varieties.
[c]GN = Great Northern

Table 9. Average difference between seeding rate and established plant stand for dry bean market classes grown in 2014.

Bean Class	Respondents (no.)	Average difference (plants per acre)
Minnesota		
Black	10	-11,500
Cranberry	2	-28,750
Great Northern	0	0
Kidney	17	-8,882
Navy	20	-10,500
Pink	3	-10,667
Pinto	4	-4,500
Red	0	0
All Classes		**-9,350**
North Dakota		
Black	9	-10,667
Cranberry	0	0
Great Northern	6	-6,667
Kidney	1	-9,000
Navy	9	-8,222
Pink	1	-8,000
Pinto	45	-6,244
Red	0	0
All Classes		**-6,100**
Northarvest		
Black	19	-11,084
Cranberry	2	-14,375
Great Northern	6	-3,334
Kidney	18	-8,941
Navy	29	-9,361
Pink	4	-9,334
Pinto	49	-5,372
Red	0	0
All Classes		**-7,725**

Table 10. Percent of total dry bean acres harvested by direct combining in 2014.

Percent direct combined	Respondents (no.)	Respondents (%)	Acres reported[a]	Acres reported[a] (%)
Minnesota				
1 to 25%	3	4.6	1,833	5.4
26 to 50%	1	1.5	300	0.9
51 to 75%	1	1.5	197	0.6
76 to 99%	6	9.2	1,565	4.6
100%	25	38.5	6,913	20.5
No direct harvest	29	44.6	22,995	68
Total	**65**	**100**	**33,803**	**100**
North Dakota				
1 to 25%	5	4.8	3,839	5.8
26 to 50%	2	1.9	2,501	3.8
51 to 75%	5	4.8	2,345	3.5
76 to 99%	17	16.2	9,682	14.6
100%	44	41.9	25,434	38.5
No direct harvest	32	30.5	22,329	33.8
Total	**105**	**100**	**66,130**	**100**
1 to 25%	8	4.7	5,672	5.7
26 to 50%	3	1.8	2,801	2.8
51 to 75%	6	3.5	2,542	2.5
76 to 99%	23	13.5	11,247	11.3
100%	69	40.6	32,347	32.4
No direct harvest	61	35.9	45,324	45.4
Total	**170**	**100**	**99,933**	**100**

[a]Respondents' harvested acres only.

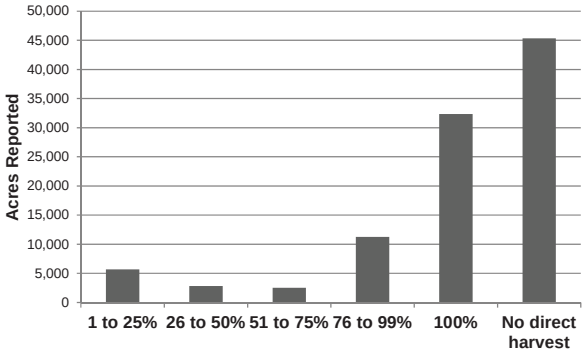


Figure 10. Northarvest percent of dry bean acres harvested by direct combining in 2014.

Table 11. Estimated yield loss in harvested dry beans in 2014.

Estimated yield loss	Direct Harvest Respondents (no.)	Direct Harvest Respondents (%)	Conventional Harvest Respondents (no.)	Conventional Harvest Respondents (%)
Minnesota				
0%	0	0	4	10.3
1-5%	15	41.7	23	59
6-10%	14	38.9	10	25.6
11-15%	4	11.1	1	2.6
16-20%	3	8.3	1	2.6
Total	**36**	**100**	**39**	**100**
North Dakota				
0%	0	0	0	0
1-5%	22	31.4	37	63.8
6-10%	34	48.6	16	27.6
11-15%	11	15.7	5	8.6
16-20%	3	4.3	0	0
Total	**70**	**100**	**58**	**100**
Northarvest				
0%	0	0	4	4.1
1-5%	37	34.9	60	61.9
6-10%	48	45.3	26	26.8
11-15%	15	14.2	6	6.2
16-20%	6	5.7	1	1
Total	**106**	**100**	**97**	**100**

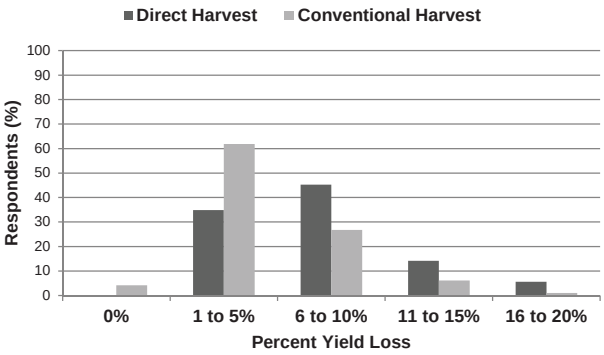


Figure 11. Northarvest estimated yield loss in harvested dry beans in 2014.

Table 12. Dry bean field tillage practices in 2014.

Tillage practice	Acres reported (no.)[a]	Acres reported (%)[a]
Minnesota		
Conventional	31,235	89.3
Minimum	3,453	9.9
Strip tillage	200	0.6
No-till	80	0.2
Total	**34,968**	**100**
North Dakota		
Conventional	51,775	76.3
Minimum	10,568	15.6
No-till	3,667	5.4
Strip tillage	1,852	2.7
Total	**67,862**	**100**
Northarvest		
Conventional	83,010	80.7
Minimum	14,021	13.6
No-till	3,747	3.6
Strip tillage	2,052	2
Total	**102,830**	**100**

[a]Respondents' acres only.

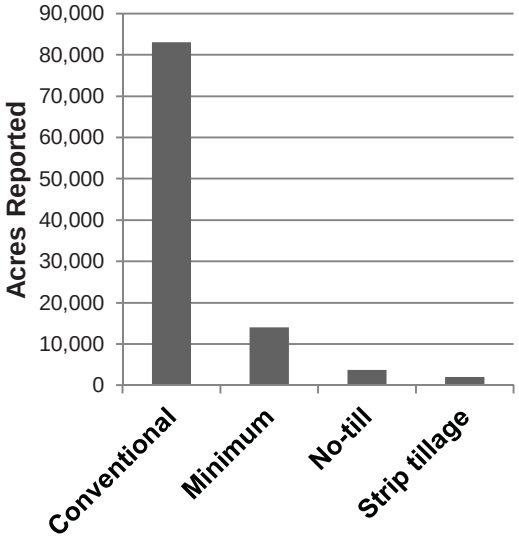


Figure 12. Northarvest dry bean field tillage practices in 2014.

Agronomy

Table 13. Use of fertilizers on dry bean fields in 2014.

Fertilizer	Respondents (no.)	Respondents (%)
Minnesota	**56**	
Nitrogen	56	100
Phosphorus	51	91.1
Potash	44	78.6
Zinc	43	76.8
Sulfur	27	48.2
North Dakota	**91**	
Nitrogen	81	89
Phosphorus	75	82.4
Potash	31	34.1
Zinc	65	71.4
Sulfur	32	35.2
Northarvest	**147**	
Nitrogen	137	93.2
Phosphorus	126	85.7
Potash	75	51
Zinc	108	73.5
Sulfur	59	40.1

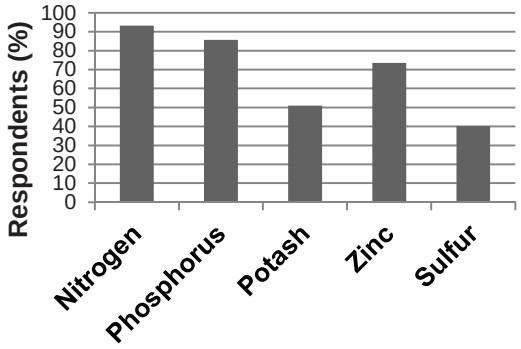


Figure 13. Northarvest use of fertilizers on dry bean fields in 2014.

Table 14. Use of soil test prior to fertilization of dry bean fields in 2014.

Soil test	Respondents (no.)	Respondents (%)
Minnesota		
Soil test used	47	73.4
Soil test not used	17	26.6
Total	**64**	**100**
North Dakota		
Soil test used	82	78.8
Soil test not used	22	21.2
Total	**104**	**100**
Northarvest		
Soil test used	129	76.8
Soil test not used	39	23.2
Total	**168**	**100**

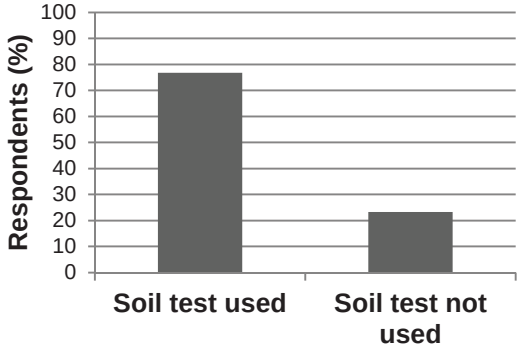


Figure 14. Northarvest use of soil test in 2014.

Table 15. Use of *Rhizobium* inoculants on dry bean fields in 2014.

Rhizobium use	Respondents (no.)	Respondents (%)
Minnesota		
Inoculant used	13	21.3
Inoculant not used	48	78.7
Total	**61**	**100**
North Dakota		
Inoculant used	16	15.5
Inoculant not used	87	84.5
Total	**103**	**100**
Northarvest		
Inoculant used	29	17.7
Inoculant not used	135	82.3
Total	**164**	**100**

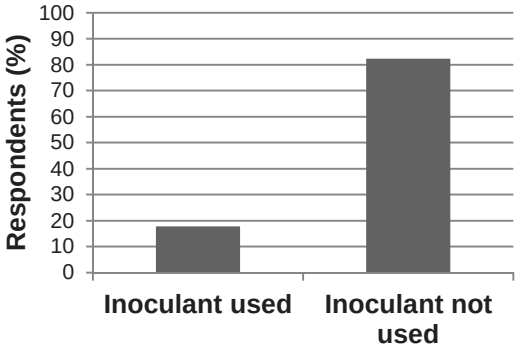


Figure 15. Northarvest use of inoculant in 2014.

Table 16. Use of site-specific nutrient management (SSNM) on dry bean fields in 2014.

Soil test	Respondents (no.)	Respondents (%)
Minnesota		
SSNM used	15	24.2
SSNM not used	47	75.8
Total	**62**	**100**
North Dakota		
SSNM used	18	17.5
SSNM not used	85	82.5
Total	**103**	**100**
Northarvest		
SSNM used	33	20
SSNM not used	132	80
Total	**165**	**100**

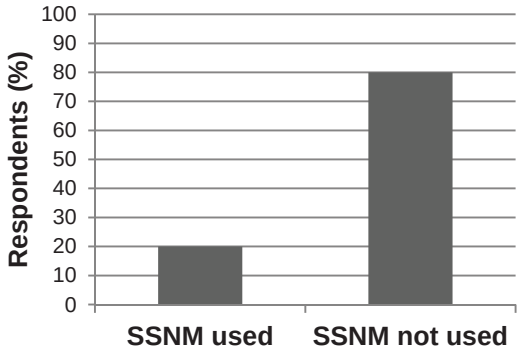


Figure 16. Northarvest use of site-specific nutrient management in 2014.

Table 17. Desiccants used on dry beans in 2014.

Desiccant	Respon-dents (no.)	Respon-dents (%)	Acres reported (no.)[a]	Acres reported (%)[a]
Minnesota				
Valor	16	25	9,498	27
No desiccant used	17	26.6	6,315	18
Sharpen	26	40.6	6,201	17.6
Sodium Chlorate	6	9.4	2,910	8.3
Glyphosate	11	17.2	2,548	7.2
Paraquat	5	7.8	2,545	7.2
North Dakota				
Sharpen	46	46.9	25,166	39.9
Glyphosate	30	30.6	18,041	28.6
Valor	23	23.5	13,919	22.1
No desiccant used	26	26.5	13,435	21.3
Paraquat	8	8.2	4,179	6.6
Sodium Chlorate	4	4.1	2,191	3.5
Northarvest				
Sharpen	72	44.4	31,367	31.9
Valor	39	24.1	23,417	23.8
Glyphosate	41	25.3	20,589	21
No desiccant used	43	26.5	19,750	20.1
Paraquat	13	8	6,724	6.8
Sodium Chlorate	10	6.2	5,101	5.2

[a]Respondents' acres only.

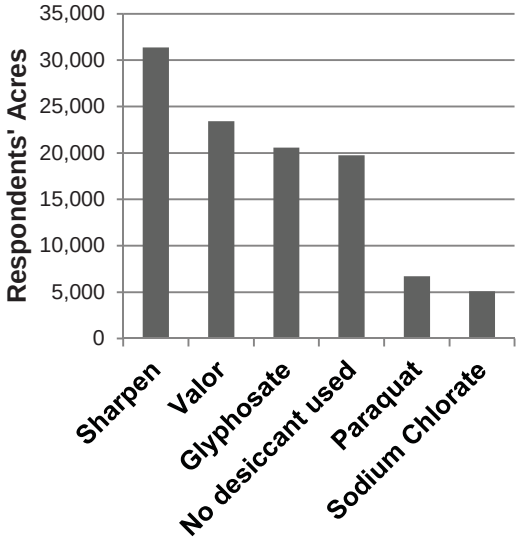


Figure 17. Northarvest desiccants used on dry beans in 2014.

Table 18. Frequency of crops in dry bean crop rotation program, 2010-2013.

Crop	2013 Respon-dents (%)	2012 Respon-dents (%)	2011 Respon-dents (%)	2010 Respon-dents (%)	4-year average Respon-dents (%)
Minnesota					
Alfalfa	1.6	1.6	1.6	1.6	**1.6**
Barley	4.8	0	3.2	1.6	**2.4**
Canola	0	0	0	0	**0**
Corn	69.8	27	60.3	30.2	**46.8**
Dry bean	6.3	25.4	31.7	36.5	**25**
Field pea	0	6.3	0	0	**1.6**
Potato	4.8	11.1	4.8	1.6	**5.6**
Soybean	6.3	41.3	23.8	28.6	**25**
Sugar beet	30.2	19	3.2	19	**17.9**
Sunflower	0	0	0	0	**0**
Wheat	19	22.2	19	11.1	**17.9**
No crop	0	0	0	1.6	**0.4**
North Dakota					
Alfalfa	0	0	0	0	**0**
Barley	10.6	2.9	9.6	2.9	**6.5**
Canola	1	2.9	1	1	**1.4**
Corn	41.3	12.5	33.7	13.5	**25.2**
Dry bean	11.5	42.3	29.8	57.7	**35.3**
Field pea	0	0	0	1	**0.2**
Potato	1.9	3.8	5.8	0	**2.9**
Soybean	1	34.6	14.4	19.2	**17.3**
Sugar beet	17.3	16.3	3.8	4.8	**10.6**
Sunflower	0	1	0	0	**0.2**
Wheat	62.5	38.5	51.9	26.9	**45**
No crop	5.8	1	1.9	1	**2.4**
Northarvest					
Alfalfa	0.6	0.6	0.6	0.6	**0.6**
Barley	8.4	1.8	7.2	2.4	**4.9**
Canola	0.6	1.8	0.6	0.6	**0.9**
Corn	52.1	18	43.7	19.8	**33.4**
Dry bean	9.6	35.9	30.5	49.7	**31.4**
Field pea	0	2.4	0	0.6	**0.7**
Potato	3	6.6	5.4	0.6	**3.9**
Soybean	3	37.1	18	22.8	**20.2**
Sugar beet	22.2	17.4	3.6	10.2	**13.3**
Sunflower	0	0.6	0	0	**0.1**
Wheat	46.1	32.3	39.5	21	**34.7**
No crop	3.6	0.6	1.2	1.2	**1.6**

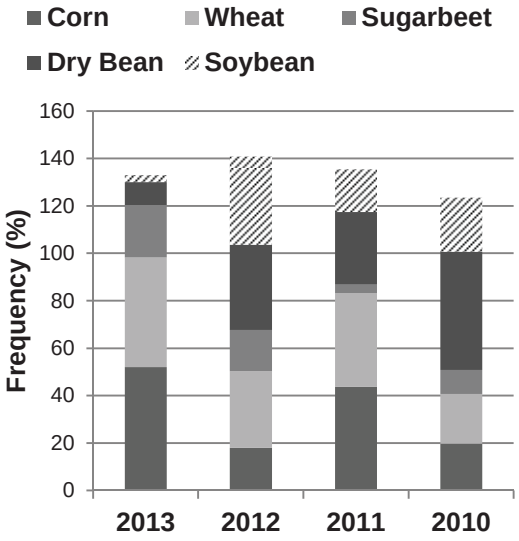


Figure 18. Northarvest frequency of major crops in dry bean crop rotation program, 2010-2013.

Table 19. Number of years dry beans are grown in dry bean crop rotation program.

Number of years	Respondents (no.)	Respondents (%)
Minnesota		
1 of past 5 years	22	34.9
2 of past 5 years	24	38.1
3 of past 5 years	13	20.6
4 of past 5 years	3	4.8
5 of past 5 years	1	1.6
Total	**63**	**100**
North Dakota		
1 of past 5 years	18	17.3
2 of past 5 years	38	36.5
3 of past 5 years	38	36.5
4 of past 5 years	7	6.7
5 of past 5 years	3	2.9
Total	**104**	**100**
Northarvest		
1 of past 5 years	40	24
2 of past 5 years	62	37.1
3 of past 5 years	51	30.5
4 of past 5 years	10	6
5 of past 5 years	4	2.4
Total	**167**	**100**

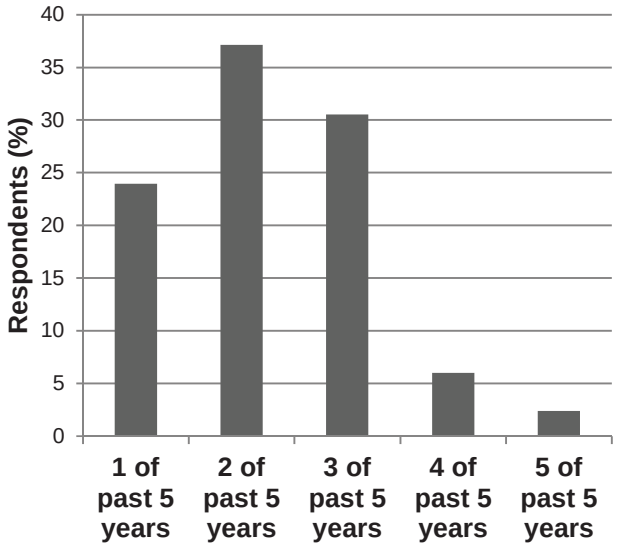


Figure 19. Northarvest number of years dry beans are grown in dry bean crop rotation program.

Table 20. Worst insect problem in dry beans in 2014.

Insect[a]	Respondents (no.)	Respondents (%)	Acres reported (no.)[b,c]	Acres reported (%)[b,c]
Minnesota				
Leafhoppers	28	45.2	15,952	46.5
None	23	37.1	14,570	42.4
Grasshoppers	3	4.8	1,929	5.6
Cutworms	2	3.2	820	2.4
Aphids	3	4.8	729	2.1
Seed corn maggot	2	3.2	227	0.7
Spider mites	1	1.6	114	0.3
Total	**62**	**100**	**34,341**	**100**
North Dakota				
None	64	66	41,237	64.8
Grasshoppers	11	11.3	6,543	10.3
Cutworms	9	9.3	4,989	7.8
Wireworms	4	4.1	3,816	6
Leafhoppers	3	3.1	2,280	3.6
Seed corn maggot	3	3.1	1,888	3
Bean leaf beetle	1	1	1,672	2.6
Aphids	1	1	1,000	1.6
Spider mites	1	1	220	0.3
Total	**97**	**100**	**63,645**	**100**
Northarvest				
None	87	54.7	55,807	57
Leafhoppers	31	19.5	18,232	18.6
Grasshoppers	14	8.8	8,472	8.6
Cutworms	11	6.9	5,809	5.9
Wireworms	4	2.5	3,816	3.9
Seed corn maggot	5	3.1	2,115	2.2
Aphids	4	2.5	1,729	1.8
Bean leaf beetle	1	0.6	1,672	1.7
Spider mites	2	1.3	334	0.3
Total	**159**	**100**	**97,986**	**100**

[a]Ranked as No. 1 insect problem by respondents.
[b]Respondents' acres only.
[c]Insect problem may not have been present across all reported acres.

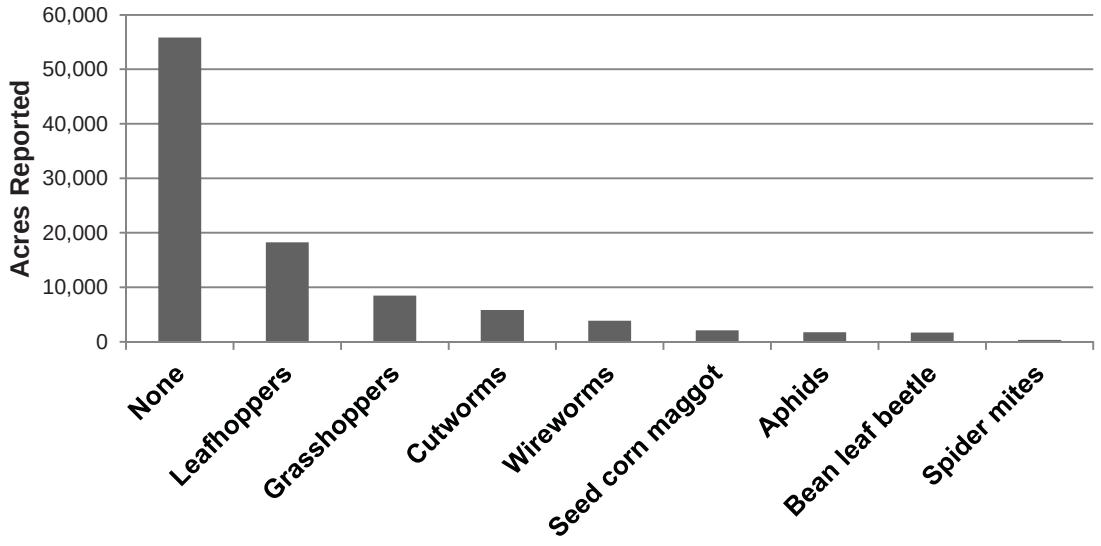


Figure 20. Northarvest worst insect problem in dry beans in 2014.

Table 21. Insects ranked as one of the three worst in dry beans in 2014.

Insect[a]	Respondents (no.)	Respondents (%)	Acres reported (no.)[b,c]	Acres reported (%)[b,c]
Minnesota				
Leafhoppers	32	51.6	16,353	47.6
None	23	37.1	14,570	42.4
Grasshoppers	12	19.4	8,144	23.7
Aphids	9	14.5	3,790	11
Cutworms	4	6.5	2,520	7.3
Bean leaf beetle	5	8.1	2,208	6.4
Wireworms	3	4.8	2,110	6.1
Seed corn maggot	6	9.7	1,464	4.3
Spider mites	3	4.8	454	1.3
North Dakota				
None	64	66	41,237	64.8
Grasshoppers	20	20.6	13,224	20.8
Cutworms	13	13.4	9,490	14.9
Wireworms	11	11.3	8,016	12.6
Leafhoppers	10	10.3	6,951	10.9
Aphids	6	6.2	3,720	5.8
Spider mites	5	5.2	3,150	4.9
Bean leaf beetle	4	4.1	2,942	4.6
Seed corn maggot	3	3.1	1,888	3
Foliage caterpillars	1	1	470	0.7
Northarvest				
None	87	54.7	55,807	57
Leafhoppers	42	26.4	23,304	23.8
Grasshoppers	32	20.1	21,368	21.8
Cutworms	17	10.7	12,010	12.3
Wireworms	14	8.8	10,126	10.3
Aphids	15	9.4	7,510	7.7
Bean leaf beetle	9	5.7	5,150	5.3
Spider mites	8	5	3,604	3.7
Seed corn maggot	9	5.7	3,352	3.4
Foliage caterpillars	1	0.6	470	0.5

[a]Ranked as No. 1, 2 or 3 insect problem by respondents.
[b]Respondents' acres only.
[c]Insect problem may not have been present across all reported acres.

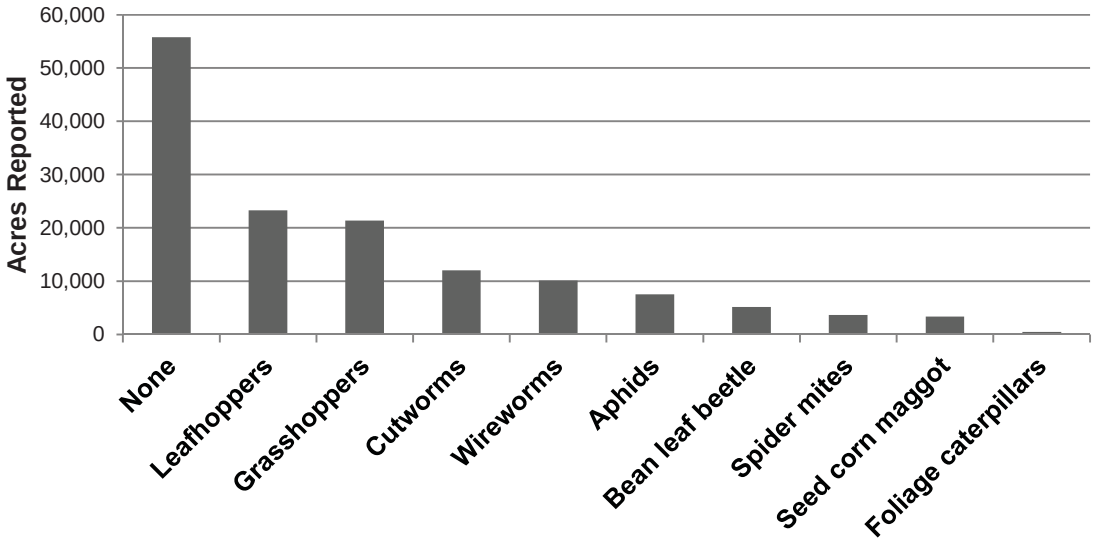


Figure 21. Northarvest insects ranked as one of the three worst in dry beans in 2014.

Table 22. Foliar insecticide use in dry beans in 2014.

Insecticide	Respondents (no.)	Respondents (%)	Acres reported (no.)[a,b]	Acres reported (%)[a,b]
Minnesota				
None	45	71.4	26,083	75.5
Asana XL	9	14.3	12,121	35.1
Hero	1	1.6	2,108	6.1
Tombstone	1	1.6	1,350	3.9
Warrior/generics	3	4.8	1,150	3.3
Dimethoate	1	1.6	450	1.3
Mustang Maxx	2	3.2	290	0.8
Brigade	1	1.6	260	0.8
Insecticide Total			**17,729**	**51.3**
North Dakota				
None	99	98	64,520	98.4
Mustang Maxx	1	1	570	0.9
Brigade	1	1	480	0.7
Insecticide Total			**1,050**	**1.6**
Northarvest				
None	144	87.8	90,603	90.5
Asana XL	9	5.5	12,121	12.1
Hero	1	0.6	2,108	2.1
Tombstone	1	0.6	1,350	1.3
Warrior/generics	3	1.8	1,150	1.1
Mustang Maxx	3	1.8	860	0.9
Brigade	2	1.2	740	0.7
Dimethoate	1	0.6	450	0.4
Insecticide Total			**18,779**	**18.8**

[a]Respondents' acres only. Multiple applications count as multiple acres.
[b]Percentages do not total 100 percent because some respondents treated more than once with the same product and/or treated the same acreage with more than one product.

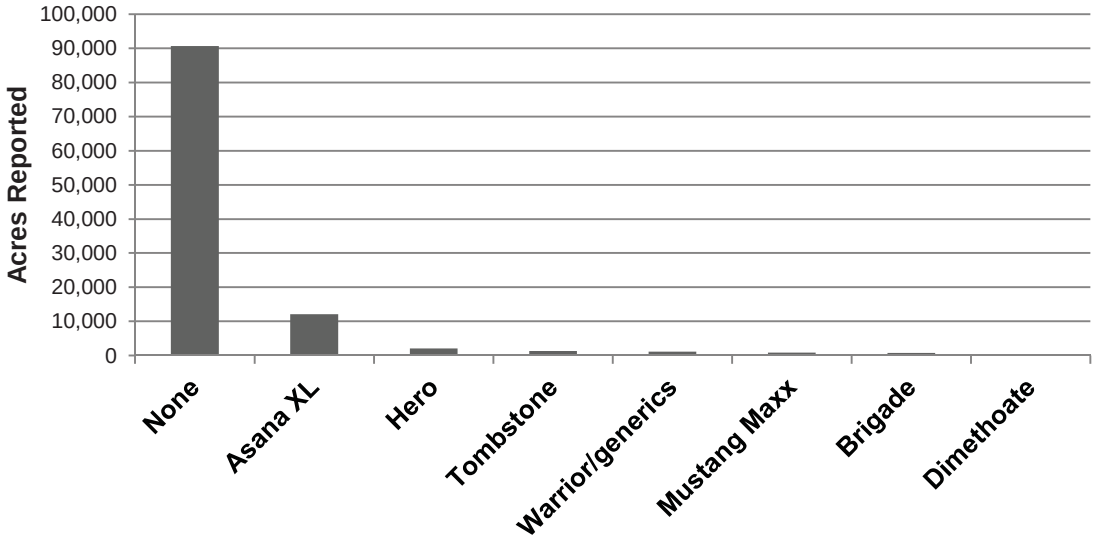


Figure 22. Northarvest foliar insecticide use in dry beans in 2014.

Table 23. Soil insecticide and seed treatment use in dry beans in 2014.

Seed Treatment	Respondents (no.)	Respondents (%)	Acres reported (no.)[a,b]	Acres reported (%)[a,b]
Minnesota				
Cruiser Maxx	30	47.6	13,284	38.5
None	15	23.8	7,966	23.1
Lorsban	11	17.5	7,073	20.5
Don't know	11	17.5	5,074	14.7
Cruiser 5FS	3	4.8	1,316	3.8
Capture LFR*	2	3.2	1,310	3.8
Insecticide Total			**28,057**	**81.2**
North Dakota				
Cruiser Maxx	32	31.7	20,109	30.7
None	26	25.7	17,008	25.9
Don't know	22	21.8	16,069	24.5
Lorsban	12	11.9	6,590	10.1
Capture LFR*	6	5.9	3,956	6
Gaucho/generics	6	5.9	3,399	5.2
Cruiser 5FS	4	4	2,400	3.7
Macho*	1	1	1,200	1.8
Insecticide Total			**53,723**	**81.9**
Northarvest				
Cruiser Maxx	62	37.8	33,393	33.4
None	41	25	24,974	24.9
Don't know	33	20.1	21,143	21.1
Lorsban	23	14	13,663	13.6
Capture LFR*	8	4.9	5,266	5.3
Cruiser 5FS	7	4.3	3,716	3.7
Gaucho/generics	6	3.7	3,399	3.4
Macho*	1	0.6	1,200	1.2
Insecticide Total			**81,780**	**81.7**

[a]Respondents' acres only.
[b]Percentages do not total 100 percent because some respondents treated more than once with the same product and/or treated the same acreage with more than one product.
*Soil-applied insecticide.

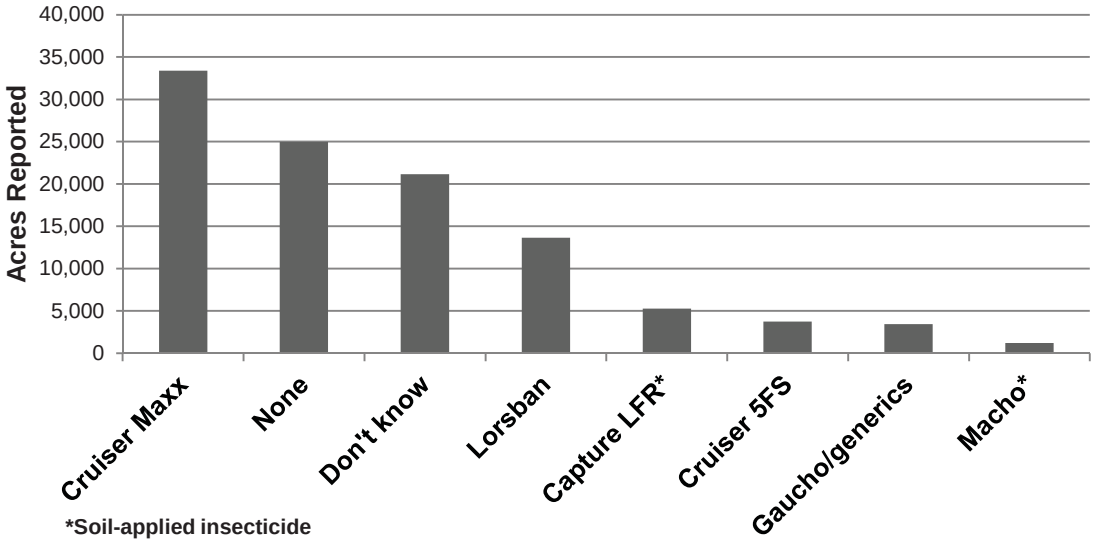


Figure 23. Northarvest insecticide seed treatment and soil insecticide use in dry beans in 2014.

Table 24. Worst disease problem in dry beans in 2014.

Disease[a]	Respondents (no.)	Respondents (%)	Acres reported (no.)[b,c]	Acres reported (%)[b,c]
Minnesota				
White mold	22	36.1	13,619	39.6
Root rot	19	31.1	11,129	32.3
Common bacterial blight	9	14.8	5,726	16.6
None	6	9.8	1,448	4.2
Bacterial brown spot	2	3.3	1,330	3.9
Anthracnose	2	3.3	800	2.3
Rust	1	1.6	360	1
Total	**61**	**100**	**34,412**	**100**
North Dakota				
White mold	65	65.7	43,080	66.3
Root rot	7	7.1	6,286	9.7
Common bacterial blight	11	11.1	5,095	7.8
None	9	9.1	4,532	7
Anthracnose	2	2	2,482	3.8
Rust	2	2	1,700	2.6
Halo blight	1	1	820	1.3
Bacterial brown spot	1	1	805	1.2
Bacterial wilt	1	1	220	0.3
Total	**99**	**100**	**65,020**	**100**
Northarvest				
White mold	87	54.4	56,699	57
Root rot	26	16.3	17,415	17.5
Common bacterial blight	20	12.5	10,821	10.9
None	15	9.4	5,980	6
Anthracnose	4	2.5	3,282	3.3
Bacterial brown spot	3	1.9	2,135	2.1
Rust	3	1.9	2,060	2.1
Halo blight	1	0.6	820	0.8
Bacterial wilt	1	0.6	220	0.2
Total	**160**	**100**	**99,432**	**100**

[a]Ranked as No. 1 disease problem by respondents.
[b]Respondents' acres only.
[c]Disease problem may not have been present across all reported acres.

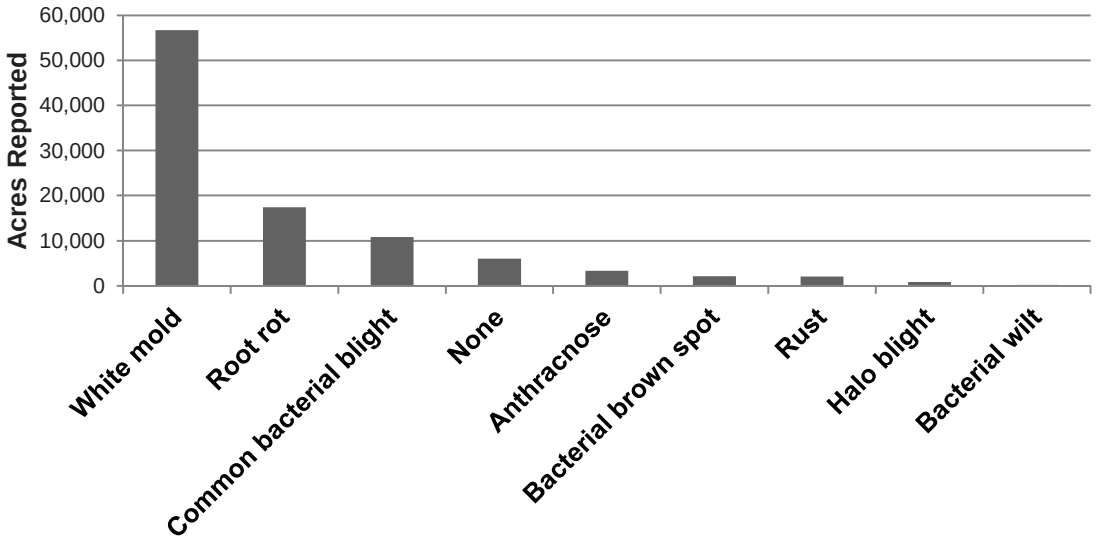


Figure 24. Northarvest worst disease problem in dry beans in 2014.

Table 25. Diseases ranked as one of the three worst in dry beans in 2014.

Disease[a]	Respondents (no.)	Respondents (%)	Acres reported (no.)[b,c]	Acres reported (%)[b,c]
Minnesota				
White mold	39	63.9	24,684	71.7
Root rot	33	54.1	23,412	68
Common bacterial blight	28	45.9	14,567	42.3
Halo blight	4	6.6	5,950	17.3
Bacterial brown spot	12	19.7	5,270	15.3
Rust	5	8.2	4,855	14.1
Viruses (general)	5	8.2	2,361	6.9
Bacterial wilt	4	6.6	2,125	6.2
None	6	9.8	1,448	4.2
Anthracnose	4	6.6	1,350	3.9
North Dakota				
White mold	83	83.8	55,761	85.8
Common bacterial blight	40	40.4	25,301	38.9
Rust	25	25.3	21,067	32.4
Root rot	23	23.2	18,468	28.4
Bacterial brown spot	14	14.1	9,104	14
Bacterial wilt	6	6.1	6,088	9.4
Anthracnose	5	5.1	4,862	7.5
None	9	9.1	4,532	7
Viruses (general)	7	7.1	3,135	4.8
Halo blight	7	7.1	2,747	4.2
Northarvest				
White mold	122	76.3	80,445	80.9
Root rot	56	35	41,880	42.1
Common bacterial blight	68	42.5	39,868	40.1
Rust	30	18.8	25,922	26.1
Bacterial brown spot	26	16.3	14,374	14.5
Halo blight	11	6.9	8,697	8.7
Bacterial wilt	10	6.3	8,213	8.3
Anthracnose	9	5.6	6,212	6.2
None	15	9.4	5,980	6
Viruses (general)	12	7.5	5,496	5.5

[a]Ranked as No. 1, 2 or 3 disease problem by respondents.
[b]Respondents' acres only.
[c]Disease problem may not have been present across all reported acres.

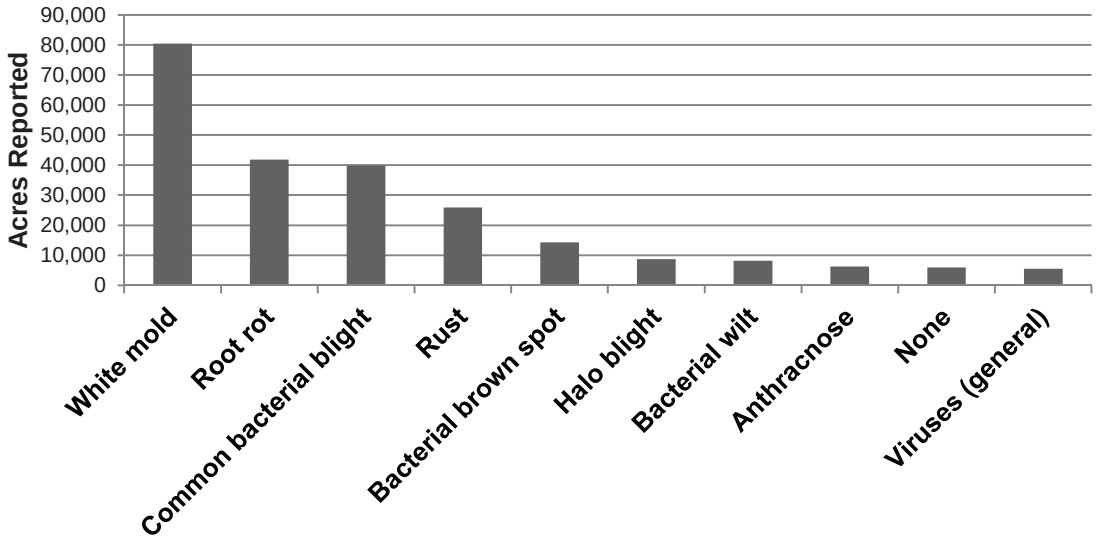


Figure 25. Northarvest diseases ranked as one of the three worst in dry beans in 2014.

Table 26. Foliar and banded fungicide use in dry beans in 2014.

Fungicide	Resp. (no.)	Resp. (%)[b]	Total acres treated (no.)[a]	Total acres treated (%)[a,b]	Acres treated by ground (no.)[a]	Acres treated by ground (%)[a]	Acres treated by air (no.)[a]	Acres treated by air (%)[a]
Minnesota								
Topsin broadcast	21	32.8	10,974	21	10,824	23.1	150	0.3
Endura	15	23.4	10,060	19.3	8,915	19.1	1,145	2.4
Proline broadcast	9	14.1	8,785	16.8	1,725	3.7	7,060	15.1
Headline	6	9.4	5,655	10.8	5,655	12.1	0	0
Omega	2	3.1	2,530	4.8	2,530	5.4	0	0
ProPulse	2	3.1	2,403	4.6	2,108	4.5	295	0.6
Priaxor	6	9.4	2,165	4.1	2,165	4.6	0	0
Copper	4	6.3	1,702	3.3	1,702	3.6	0	0
Incognito	3	4.7	1,020	2	1,020	2.2	0	0
Topsin banded	2	3.1	793	1.5	793	1.7	0	0
Folicur	1	1.6	300	0.6	300	0.6	0	0
Contans	1	1.6	220	0.4	220	0.5	0	0
Proline banded	1	1.6	160	0.3	160	0.3	0	0
None	21	32.8	5,488	10.5	---	---	---	---
Fungicide Total			**46,767**		**38,117**	**81.5**	**8,650**	**18.5**
North Dakota								
Topsin broadcast	27	26.5	22,381	27.8	21,365	35.6	1,016	1.7
Endura	31	30.4	14,539	18.1	14,225	23.7	314	0.5
Incognito	7	6.9	4,718	5.9	4,718	7.9	0	0
Tebuconazole	7	6.9	4,356	5.4	4,156	6.9	200	0.3
Priaxor	7	6.9	3,554	4.4	3,054	5.1	500	0.8
Headline	6	5.9	2,912	3.6	2,912	4.8	0	0
Folicur	1	1	2,400	3	2,400	4	0	0
Aproach	3	2.9	1,927	2.4	1,927	3.2	0	0
Topsin banded	5	4.9	1,782	2.2	1,782	3	0	0
Contans	2	2	1,160	1.4	1,160	1.9	0	0
ProPulse	2	2	350	0.4	350	0.6	0	0
None	35	34.3	20,337	25.3	---	---	---	---
Fungicide Total			**60,079**		**58,049**	**96.6**	**2,030**	**3.4**
Northarvest								
Topsin broadcast	48	28.9	33,355	25.1	32,189	30.1	1,166	1.1
Endura	46	27.7	24,599	18.5	23,140	21.7	1,459	1.4
Proline broadcast	9	5.4	8,785	6.6	1,725	1.6	7,060	6.6
Headline	12	7.2	8,567	6.5	8,567	8	0	0
Incognito	10	6	5,738	4.3	5,738	5.4	0	0
Priaxor	13	7.8	5,719	4.3	5,219	4.9	500	0.5
Tebuconazole	7	4.2	4,356	3.3	4,156	3.9	200	0.2
ProPulse	4	2.4	2,753	2.1	2,458	2.3	295	0.3
Folicur	2	1.2	2,700	2	2,700	2.5	0	0
Topsin banded	7	4.2	2,575	1.9	2,575	2.4	0	0
Omega	2	1.2	2,530	1.9	2,530	2.4	0	0
Aproach	3	1.8	1,927	1.5	1,927	1.8	0	0
Copper	4	2.4	1,702	1.3	1,702	1.6	0	0
Contans	3	1.8	1,380	1	1,380	1.3	0	0
Proline banded	1	0.6	160	0.1	160	0.1	0	0
None	56	33.7	25,825	19.5	---	---	---	---
Fungicide Total			**106,846**		**96,166**	**90**	**10,680**	**10**

[a]Respondents' acres only. Includes acreage treated more than once with the same product.
[b]Percentages do not total 100 percent because some respondents treated more than once with the same product and/or treated the same acreage with more than one product.

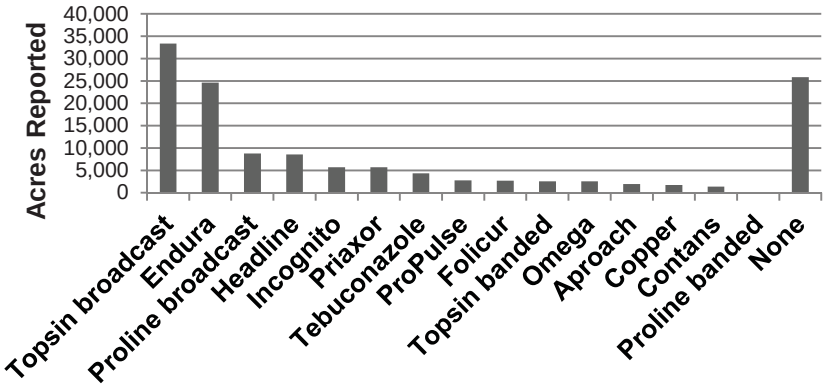


Figure 26. Northarvest foliar and banded fungicide use in dry beans in 2014.

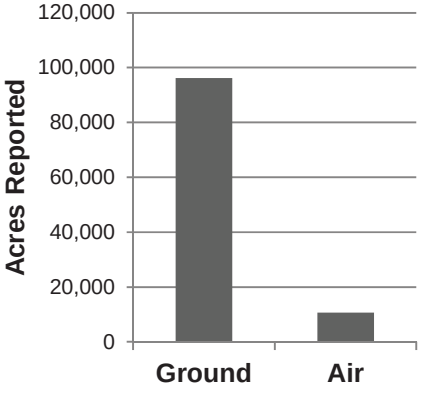


Figure 27. Northarvest fungicide application method in dry beans in 2014.

Table 27. Fungicide seed treatment use in dry beans in 2014.

Seed treatment	Respondents (no.)	Respondents (%)[b]	Total acres treated (no.)[a]	Total acres treated (%)[a,b]
Minnesota				
Apron Maxx	39	60.9	22,423	38.3
Rancona	12	18.8	9,124	15.6
Maxim	10	15.6	8,015	13.7
Dynasty	14	21.9	6,319	10.8
Apron XL	11	17.2	5,070	8.7
Don't know	4	6.3	2,150	3.7
Captan	3	4.7	1,033	1.8
Headline	1	1.6	900	1.5
Stamina	1	1.6	800	1.4
Thiram	1	1.6	290	0.5
Vibrance	1	1.6	260	0.4
None	9	14.1	2,222	3.8
Seed Treatment Total			**56,384**	
North Dakota				
Apron Maxx	47	47	33,919	41.3
Don't know	16	16	10,973	13.4
Dynasty	8	8	5,401	6.6
Captan	5	5	4,916	6
Apron XL	7	7	4,579	5.6
Rancona Summit	2	2	2,807	3.4
Rancona	4	4	1,848	2.2
Thiram	1	1	1,514	1.8
Headline	3	3	1,510	1.8
Maxim	3	3	1,216	1.5
Streptomycin	1	1	1,168	1.4
Stamina	1	1	1,000	1.2
None	23	23	11,287	13.7
Seed Treatment Total			**70,851**	
Northarvest				
Apron Maxx	86	52.4	56,342	40
Don't know	20	12.2	13,123	9.3
Dynasty	22	13.4	11,720	8.3
Rancona	16	9.8	10,972	7.8
Apron XL	18	11	9,649	6.9
Maxim	13	7.9	9,231	6.6
Captan	8	4.9	5,949	4.2
Rancona Summit	2	1.2	2,807	2
Headline	4	2.4	2,410	1.7
Thiram	2	1.2	1,804	1.3
Stamina	2	1.2	1,800	1.3
Streptomycin	1	0.6	1,168	0.8
Vibrance	1	0.6	260	0.2
None	32	19.5	13,509	9.6
Seed Treatment Total			**127,235**	

[a]Respondents' acres only. Includes acreage treated with more than one product.
[b]Percentages do not total 100 percent because some respondents treated the same acreage with more than one product.

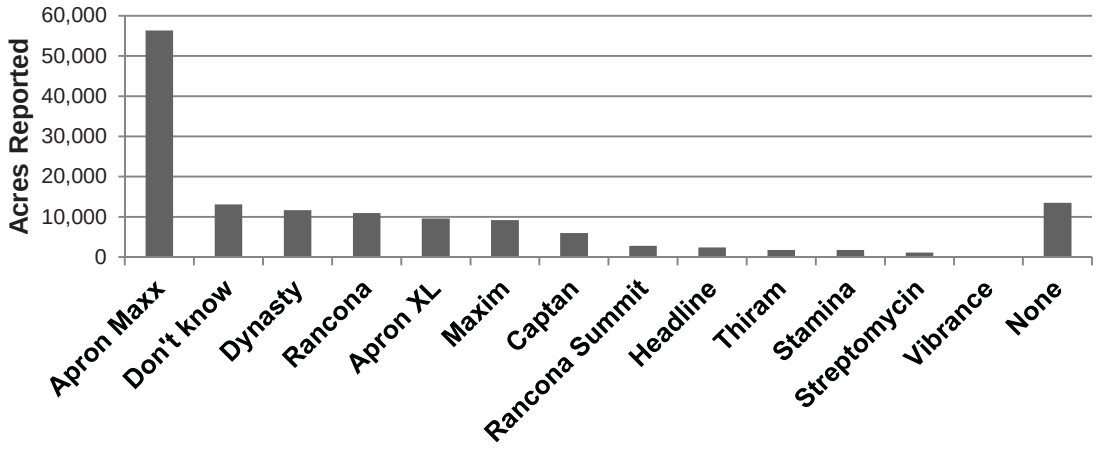


Figure 28. Northarvest fungicide seed treatment use in dry beans in 2014.

Table 28. Worst weed problem in dry beans in 2014.

Weed[a]	Respondents (no.)	Respondents (%)	Acres reported (no.)[b,c]	Acres reported (%)[b,c]
Minnesota				
Lambsquarters	26	40.6	17,086	48.6
Ragweed	9	14.1	7,198	20.5
Waterhemp	14	21.9	4,202	11.9
Nightshade	5	7.8	3,092	8.8
Biennial wormwood	5	7.8	2,277	6.5
Kochia	1	1.6	527	1.5
Mustard	2	3.1	452	1.3
Volunteer grain	1	1.6	260	0.7
Redroot pigweed	1	1.6	80	0.2
Total	**64**	**100**	**35,174**	**100**
North Dakota				
Lambsquarters	15	15.3	14,578	22.6
Kochia	21	21.4	12,374	19.2
Wild mustard	16	16.3	9,012	14
Biennial wormwood	11	11.2	8,427	13.1
Ragweed	7	7.1	5,265	8.2
Cocklebur	5	5.1	3,059	4.8
Canada thistle	5	5.1	2,381	3.7
Wild buckwheat	5	5.1	2,030	3.2
Redroot pigweed	3	3.1	1,665	2.6
Nightshade	2	2	1,590	2.5
Cheatgrass	1	1	1,100	1.7
Waterhemp	3	3.1	942	1.5
Wild oats	1	1	800	1.2
Volunteer grain	1	1	600	0.9
False chamomile	1	1	314	0.5
Foxtail	1	1	240	0.4
Total	**98**	**100**	**64,377**	**100**
Northharvest				
Lambsquarters	41	25.3	31,664	31.8
Kochia	22	13.6	12,901	13
Ragweed	16	9.9	12,463	12.5
Biennial wormwood	16	9.9	10,704	10.8
Wild mustard	16	9.9	9,012	9.1
Waterhemp	17	10.5	5,144	5.2
Nightshade	7	4.3	4,682	4.7
Cocklebur	5	3.1	3,059	3.1
Canada thistle	5	3.1	2,381	2.4
Wild buckwheat	5	3.1	2,030	2
Redroot pigweed	4	2.5	1,745	1.8
Cheatgrass	1	0.6	1,100	1.1
Volunteer grain	2	1.2	860	0.9
Wild oats	1	0.6	800	0.8
Mustard	2	1.2	452	0.5
False chamomile	1	0.6	314	0.3
Foxtail	1	0.6	240	0.2
Total	**162**	**100**	**99,551**	**100**

[a]Ranked as No. 1 weed problem by respondents.
[b]Respondents' acres only.
[c]Weed problem may not have been present across all reported acres.

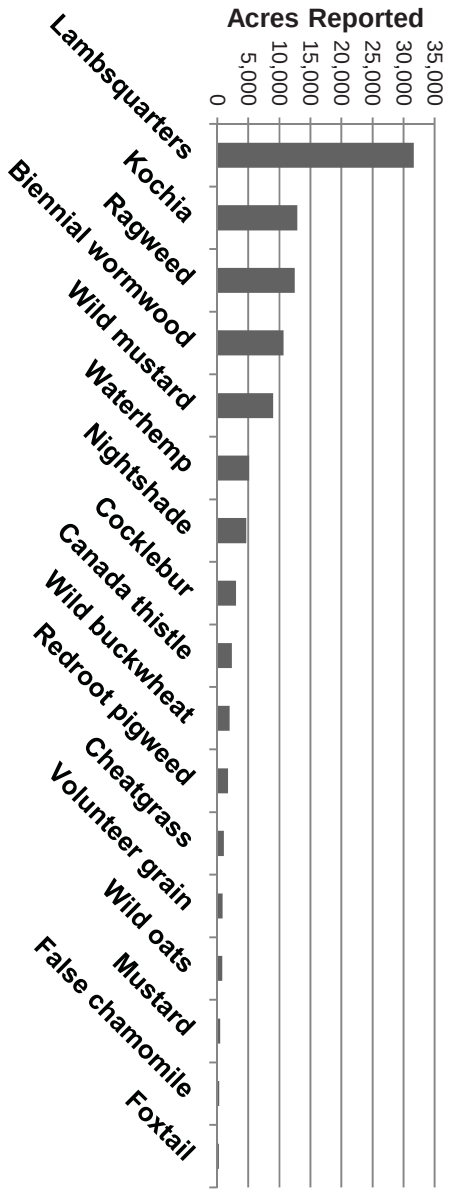


Figure 29. Northharvest worst weed problem in dry beans in 2014.

Table 29. Weeds ranked as one of the three worst in dry beans in 2014

Weed[a]	Respondents (no.)	Respondents (%)	Acres reported (no.)[b]	Acres reported (%)[b]
Minnesota				
Lambsquarters	48	75	28,066	79.8
Ragweed	30	46.9	22,434	63.8
Redroot pigweed	23	35.9	13,873	39.4
Nightshade	16	25	9,238	26.3
Waterhemp	22	34.4	7,229	20.6
Biennial wormwood	10	15.6	4,702	13.4
Foxtail	4	6.3	3,255	9.3
Wild buckwheat	2	3.1	2,228	6.3
Volunteer grain	5	7.8	2,165	6.2
Canada thistle	4	6.3	2,035	5.8
Wild mustard	3	4.7	1,257	3.6
Kochia	3	4.7	1,252	3.6
Lanceleaf sage	1	1.6	1,084	3.1
Cocklebur	4	6.3	825	2.3
Wild oats	1	1.6	558	1.6
Velvetleaf	1	1.6	470	1.3
Alsike clover	1	1.6	360	1
Smartweed	2	3.1	347	1
Mallow	1	1.6	300	0.9
Black medic	1	1.6	290	0.8
Sunflower	2	3.1	227	0.6
North Dakota				
Kochia	46	46.9	32,250	50.1
Lambsquarters	29	29.6	24,030	37.3
Biennial wormwood	24	24.5	18,908	29.4
Wild mustard	29	29.6	17,766	27.6
Redroot pigweed	26	26.5	17,584	27.3
Nightshade	22	22.4	16,373	25.4
Ragweed	22	22.4	12,778	19.8
Canada thistle	18	18.4	8,978	13.9
Cocklebur	13	13.3	8,178	12.7
Volunteer grain	14	14.3	8,051	12.5
Wild buckwheat	13	13.3	7,828	12.2
Waterhemp	5	5.1	1,807	2.8
Smartweed	3	3.1	1,700	2.6
Wild oats	3	3.1	1,681	2.6
Dock	1	1	1,650	2.6
Cheatgrass	1	1	1,100	1.7
Foxtail	4	4.1	1,090	1.7
Volunteer canola	1	1	1,000	1.6
Sunflower	1	1	653	1
Marshelder	1	1	620	1
Black medic	1	1	570	0.9
False chamomile	1	1	314	0.5
Lanceleaf sage	1	1	130	0.2
Mallow	1	1	100	0.2
Northarvest				
Lambsquarters	77	47.5	52,096	52.3
Ragweed	52	32.1	35,212	35.4
Kochia	49	30.2	33,502	33.7
Redroot pigweed	49	30.2	31,457	31.6
Nightshade	38	23.5	25,611	25.7
Biennial wormwood	34	21	23,610	23.7
Wild mustard	32	19.8	19,023	19.1
Canada thistle	22	13.6	11,013	11.1
Volunteer grain	19	11.7	10,216	10.3
Wild buckwheat	15	9.3	10,056	10.1
Waterhemp	27	16.7	9,036	9.1
Cocklebur	17	10.5	9,003	9
Foxtail	8	4.9	4,345	4.4
Wild oats	4	2.5	2,239	2.2
Smartweed	5	3.1	2,047	2.1
Dock	1	0.6	1,650	1.7
Lanceleaf sage	2	1.2	1,214	1.2
Cheatgrass	1	0.6	1,100	1.1
Volunteer canola	1	0.6	1,000	1
Sunflower	3	1.9	880	0.9
Black medic	2	1.2	860	0.9
Marshelder	1	0.6	620	0.6
Velvetleaf	1	0.6	470	0.5
Mallow	2	1.2	400	0.4
Alsike clover	1	0.6	360	0.4
False chamomile	1	0.6	314	0.3

[a]Ranked as No. 1, 2 or 3 weed by respondents.
[b]Respondents' acres only.
[c]Weed problem may not have been present across all reported acres.

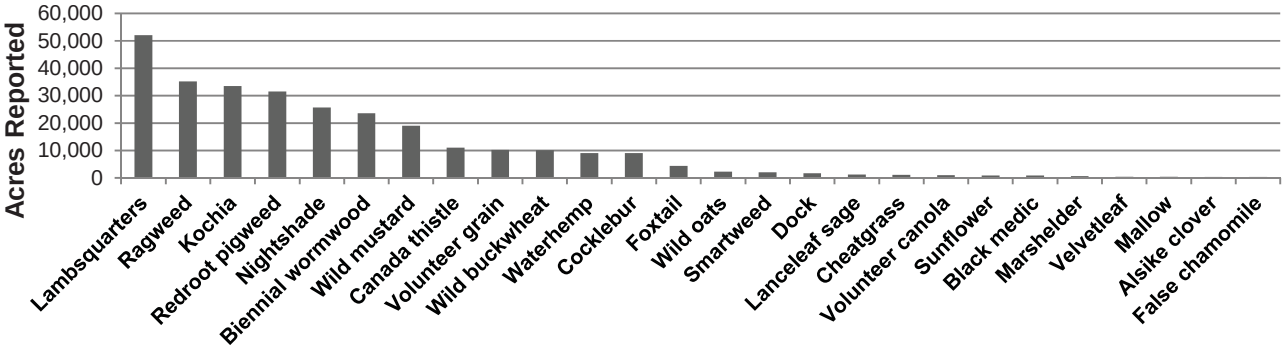


Figure 30. Northarvest weeds ranked as one of three worst in dry beans in 2014.

Table 30. Weed control practices used in dry beans in 2014.

Herbicide or other practice	Acres reported (no.)[a]	Acres reported (%)[b]
Minnesota		
Raptor	26,529	75.4
Basagran	19,376	55.1
Reflex	15,315	43.5
Rezult	13,401	38.1
Select	12,691	36.1
Sonalan (spring)	12,264	34.9
Prowl	8,003	22.8
Dual	6,345	18.0
Outlook	5,995	17.0
Trifluralin (spring)	4,652	13.2
Permit	3,800	10.8
Assure	1,920	5.5
Eptam (fall)	1,600	4.5
Eptam (spring)	1,251	3.6
Poast	1,085	3.1
Spartan	745	2.1
Glyphosate (preplant)	520	1.5
Fusilade	142	0.4
Glyphosate (postharvest)	80	0.2
Cultivation	15,637	44.5
Rotary hoe	2,994	8.5
Manual labor	1,397	4.0
Herbicide Total[c]	**135,714**	
North Dakota		
Raptor	59,067	89.4
Rezult	53,409	80.8
Reflex	34,600	52.3
Select	26,108	39.5
Sonalan (spring)	21,364	32.3
Basagran	20,223	30.6
Spartan	15,054	22.8
Glyphosate (preplant)	9,527	14.4
Prowl	8,988	13.6
BroadAxe	8,752	13.2
Permit	7,899	12.0
Assure	6,494	9.8
Pursuit	6,084	9.2
Outlook	3,393	5.1
Trifluralin (spring)	3,170	4.8
Dual	1,357	2.1
Fusilade	600	0.9
Poast	252	0.4
Glyphosate (postharvest)	239	0.4
Cultivation	20,386	30.8
Rotary hoe	3,038	4.6
Manual labor	2,549	3.9
Herbicide Total[c]	**286,580**	
Northarvest		
Raptor	85,596	84.5
Rezult	66,810	66.0
Reflex	49,915	49.3
Basagran	39,599	39.1
Select	38,799	38.3
Sonalan (spring)	33,628	33.2
Prowl	16,991	16.8
Spartan	15,799	15.6
Permit	11,699	11.6
Glyphosate (preplant)	10,047	9.9
Outlook	9,388	9.3
BroadAxe	8,752	8.6
Assure	8,414	8.3
Trifluralin (spring)	7,822	7.7
Dual	7,702	7.6
Pursuit	6,084	6.0
Eptam (fall)	1,600	1.6
Poast	1,337	1.3
Eptam (spring)	1,251	1.2
Fusilade	742	0.7
Glyphosate (postharvest)	319	0.3
Cultivation	36,023	35.6
Rotary hoe	6,032	6.0
Manual labor	3,946	3.9
Herbicide Total[c]	**422,294**	

[a]Respondents' acres only. Includes acreage treated more than once with the same product.
[b]Percentages do not total 100 percent because some respondents treated more than once with the same product and/or treated the same acreage with more than one product.
[c]Herbicide total does not include cultivation, rotary hoe or manual labor acres.

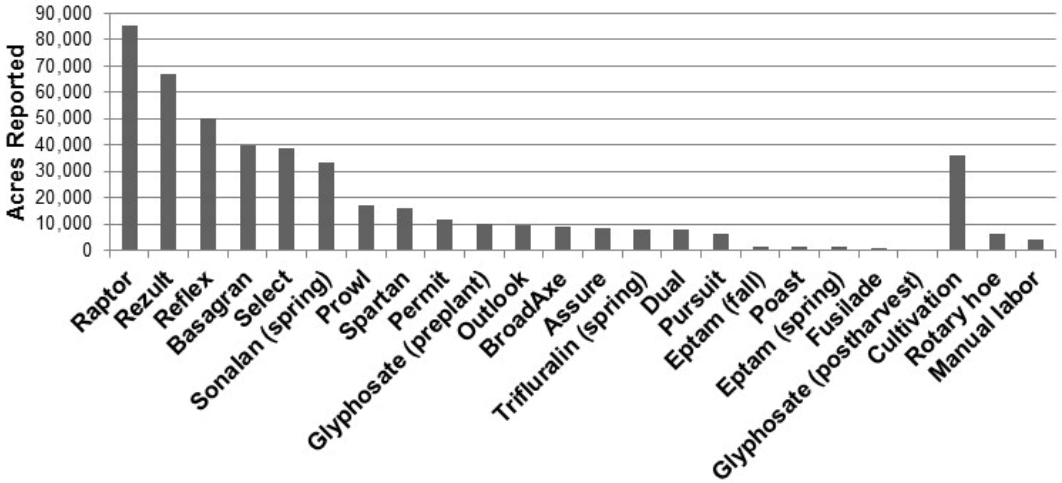


Figure 31. Northarvest weed control practices used in dry beans in 2014.

Table 31. Weed control practices used by dry bean market class in 2014.

Herbicide or other practice	Black	Cranberry	Great Northern	Kidney	Navy	Pink	Pinto	Red
				% Acres Treated[a,b]				
Minnesota								
Assure	5.6	0	0	0.4	18.5	0	0	0
Basagran	63	8.2	0	65.1	44	29.7	0	0
Dual	0	0	0	30.5	1.1	29.7	0	0
Eptam (fall)	0	0	0	8.3	0	0	0	0
Eptam (spring)	0	0	0	2.1	6.7	0	18.5	0
Fusilade	0	0	0	0.4	0.7	0	0	0
Glyphosate (preplant)	0	0	0	0	6	0	0	0
Glyphosate (postharvest)	0	0	0	0	0.9	0	0	0
Outlook	11.1	0	0	24.4	9.8	0	0	0
Permit	4	0	0	18.4	1.1	0	0	0
Poast	15.4	0	0	0	5.2	0	0	0
Prowl	26.4	8.2	0	27	19.3	0	0	0
Raptor	103.6	100	0	65.7	74.7	123.4	74.4	0
Reflex	61.8	91.8	0	30.5	50.2	123.4	35.9	0
Rezult	70.3	91.8	0	12.8	66	93.8	45.5	0
Select	41.7	0	0	33.6	26.8	123.4	43.1	0
Sonalan (spring)	61.2	91.8	0	17.6	53.8	46.9	43.8	0
Spartan	4	0	0	0	6.7	0	0	0
Trifluralin (spring)	3.6	0	0	13.6	12.1	23.4	37.7	0
Cultivation	15	0	0	46.9	61.8	0	43.8	0
Rotary hoe	16.3	0	0	3.6	8	0	65.9	0
Manual labor	5.6	0	0	1.5	10.1	0	0	0
North Dakota								
Assure	1.9	0	35.6	0	5.3	0	10.7	0
Basagran	31.5	0	40.2	32	28.1	0	29.5	0
BroadAxe	1.1	0	42.7	0	4.2	0	15.8	0
Dual	2.4	0	0	0	1.5	0	2.3	0
Fusilade	0	0	14.2	0	0	0	0.5	0
Glyphosate (preplant)	11.4	0	0	0	1.6	0	19.2	0
Glyphosate (postharvest)	1.9	0	0	0	0	0	0	0
Outlook	13.9	55.2	0	0	14.5	0	1.1	0
Permit	7.1	0	64.1	9.8	2.9	0	11.5	26.7
Poast	0	0	0	0	0	0	0.6	0
Prowl	16.2	44.8	4.6	77.5	23.4	0	9.6	0
Pursuit	0	0	4.6	0	18.3	0	8.5	0
Raptor	88.4	44.8	59.8	54.5	83.3	100	89.5	26.7
Reflex	44.5	0	50.2	41.1	81.7	0	44	17.8
Rezult	59.8	100	100	22.5	74.4	100	82	26.7
Select	37.1	0	19.6	32	28.7	0	43	0
Sonalan (spring)	18	0	10	0	40.3	100	32.7	0
Spartan	15.5	0	35.6	22.5	7.9	0	26.5	26.7
Trifluralin (spring)	2.1	0	0	0	0	0	6.8	0
Cultivation	13.3	44.8	28.5	32	35.8	211.3	30	0
Rotary hoe	12.2	44.8	0	0	2	0	4	0
Manual labor	0	0	0	1.8	9.2	0	3.2	0
Northarvest								
Assure	3.1	0	35.6	0.4	10.8	0	10.4	0
Basagran	42.2	6.3	40.2	64.2	34.7	23.3	28.6	0
BroadAxe	0.7	0	42.7	0	2.5	0	15.4	0
Dual	1.6	0	0	29.7	1.3	23.3	2.2	0
Eptam (fall)	0	0	0	8.1	0	0	0	0
Eptam (spring)	0	0	0	2	2.8	0	0.6	0
Fusilade	0	0	14.2	0.4	0.3	0	0.4	0
Glyphosate (preplant)	7.6	0	0	0	3.4	0	18.6	0
Glyphosate (postharvest)	1.2	0	0	0	0.4	0	0	0
Outlook	13	12.6	0	23.7	12.5	0	1.1	0
Permit	6	0	64.1	18.2	2.1	0	11.2	26.7
Poast	5.2	0	0	0	2.1	0	0.6	0
Prowl	19.7	16.5	4.6	28.4	21.7	0	9.3	0
Pursuit	0	0	4.6	0	10.7	0	8.2	0
Raptor	93.5	87.4	59.8	65.4	79.7	118.4	89.1	26.7
Reflex	50.4	70.9	50.2	30.8	68.6	96.7	43.8	17.8
Rezult	63.3	93.7	100	13.1	70.9	95.1	80.9	26.7
Select	38.7	0	19.6	33.5	27.9	96.7	43	0
Sonalan (spring)	32.6	70.9	10	17.1	45.9	58.4	33	0
Spartan	11.6	0	35.6	0.6	7.4	0	25.7	26.7
Trifluralin (spring)	2.6	0	0	13.3	5	18.4	7.8	0
Cultivation	13.9	10.2	28.5	46.5	46.6	45.8	30.4	0
Rotary hoe	13.6	10.2	0	3.5	4.5	0	5.9	0
Manual labor	1.9	0	0	1.5	9.6	0	3.1	0

[a]Respondents' acres only. Includes acreage treated more than once with the same product.
[b]Percentages do not total 100 percent because some respondents treated more than once with the same product and/or treated the same acreage with more than one product.

Scouting and Threshold Practices

Table 32. Scouting practices in dry beans in 2014.

	Insects		Diseases		Weeds	
Minnesota	**Respon-dents (no.)**	**Respon-dents (%)**	**Respon-dents (no.)**	**Respon-dents (%)**	**Respon-dents (no.)**	**Respon-dents (%)**
Grower	35	54.7	33	53.2	35	55.6
Crop consultant	24	37.5	23	37.1	24	38.1
Both	5	7.8	6	9.7	4	6.3
Don't scout	0	0	0	0	0	0
Total	**64**	**100**	**62**	**100**	**63**	**100**
North Dakota						
Grower	50	48.5	50	48.5	50	50.5
Crop consultant	41	39.8	39	37.9	40	40.4
Both	6	5.8	11	10.7	8	8.1
Don't scout	6	5.8	3	2.9	1	1
Total	**103**	**100**	**103**	**100**	**99**	**100**
Northarvest						
Grower	85	50.9	83	50.3	85	52.5
Crop consultant	65	38.9	62	37.6	64	39.5
Both	11	6.6	17	10.3	12	7.4
Don't scout	6	3.6	3	1.8	1	0.6
Total	**167**	**100**	**165**	**100**	**162**	**100**

Table 33. Use of economic thresholds for insects in dry beans in 2014.

	Respondents (no.)	Respondents (%)
Minnesota		
Economic thresholds used	64	100
Economic thresholds not used	0	0
Total	**64**	**100**
North Dakota		
Economic thresholds used	102	100
Economic thresholds not used	0	0
Total	**102**	**100**
Northarvest		
Economic thresholds used	166	100
Economic thresholds not used	0	0
Total	**166**	**100**

References

Bradley, C.A., and Luecke, J.L. 2004. 2002 Dry Bean Grower Survey of Pest Problems and Pesticide Use in Minnesota and North Dakota. NDSU Extension Rpt. PP-1265.

Knodel, J.J., Beauzay, P.B., Franzen, D.W., Kandel, H.J., Markell, S.G., Osorno, J.M., Pasche, J.S., and Zollinger, R.K. 2014. 2013 Dry Bean Grower Survey of Production, Pest Problems and Pesticide Use in Minnesota and North Dakota. NDSU Extension Rpt. E-1710.

Knodel, J.J., Beauzay, P.B., Franzen, D.W., Kandel, H.J., Markell, S.G., Osorno, J.M., and Zollinger, R.K. 2013. 2012 Dry Bean Grower Survey of Pest Problems and Pesticide Use in Minnesota and North Dakota. NDSU Extension Rpt. E-1640.

Knodel, J.J., Beauzay, P.B., Franzen, D.W., Kandel, H.J., Markell, S.G., Osorno, J.M., and Zollinger, R.K. 2012. 2011 Dry Bean Grower Survey of Pest Problems and Pesticide Use in Minnesota and North Dakota. NDSU Extension Rpt. E-1602.

Knodel, J.J., Luecke, J.L., Beauzay, P.B., Franzen, D.W., Kandel, H.J., Markell, S.G., Osorno, J.M., and Zollinger, R.K. 2011. 2010 Dry Bean Grower Survey of Pest Problems and Pesticide Use in Minnesota and North Dakota. NDSU Extension Rpt. E-1522 (revised).

Knodel, J.J., Luecke, J.L., Beauzay, P.B., Franzen, D.W., Kandel, H.J., Markell, S.G., Osorno, J.M., and Zollinger, R.K. 2010. 2009 Dry Bean Grower Survey of Pest Problems and Pesticide Use in Minnesota and North Dakota. NDSU Extension Rpt. E-1421 (revised).

Knodel, J.J., Luecke, J.L., Beauzay, P.B., Franzen, D.W., Kandel, H.J., Markell, S.G., Osorno, J.M., and Zollinger, R.K. 2009. 2008 Dry Bean Grower Survey of Pest Problems and Pesticide Use in Minnesota and North Dakota. NDSU Extension Rpt. E-1421 (revised).

Knodel, J.J., Luecke, J.L., Beauzay, P.B., Franzen, D.W., Kandel, H.J., Markell, S.G., Osorno, J.M., and Zollinger, R.K. 2008. 2007 Dry Bean Grower Survey of Pest Problems and Pesticide Use in Minnesota and North Dakota. NDSU Extension Rpt. PP-1392.

Knodel, J.J., Luecke, J.L., Beauzay, P.B., Franzen, D.W., Kandel, H.J., Markell, S.G., Osorno, J.M., and Zollinger, R.K. 2008. 2006 Dry Bean Grower Survey of Pest Problems and Pesticide Use in Minnesota and North Dakota. NDSU Extension Rpt. PP-1265 (revised).

Knodel, J.J., Bradley, C.A., Luecke, J.L., and Mars, G.A. 2008. 2004 and 2005 Dry Bean Grower Survey of Pest Problems and Pesticide Use in Minnesota and North Dakota. NDSU Extension Rpt. PP-1265 (revised).

Lamey, H.A., Berglund, D.R., McMullen, M.P., Luecke, J.L., Venette, J.R., McBride, D.K., Zollinger, R.K., and Grafton, K.F. 1993. 1991 Dry Bean Grower Survey of Pest Problems and Pesticide Use in Minnesota and North Dakota. NDSU Extension Rpt. 13.

Lamey, H.A., Berglund, D.R., McMullen, M.P., Luecke, J.L., Zollinger, R.K., Glogoza, P.A., Venette, J.R., McBride, D.K., and Grafton, K.F. 1994. 1992 Dry Bean Grower Survey of Pest Problems and Pesticide Use in Minnesota and North Dakota. NDSU Extension Rpt. 19.

Lamey, H.A., Berglund, D.R., McMullen, M.P., Zollinger, R.K., Venette, J.R., McBride, D.K., Venette, S.J., and Venette, R.C. 1992. 1990 Dry Bean Grower Survey of Pest Problems and Pesticide Use in Minnesota and North Dakota. NDSU Extension Rpt. 10.

Lamey, H.A., Dexter, A.G., McBride, D.K., Venette, R.C., and Venette, J.R. 1990. Problems and Practices of Northarvest Dry Bean Growers in 1988. N.D. Farm Res. 48(20):6-11, 14.

Lamey, H.A., McMullen, M.P., Glogoza, P.A., Zollinger, R.K., Luecke, J.L., Berglund, D.R., Venette, J.R., and Grafton, K.F. 1998. 1996 Dry Bean Grower Survey of Pest Problems and Pesticide Use in Minnesota and North Dakota. NDSU Extension Rpt. 44.

Lamey, H.A., Zollinger, R.K., Luecke, J.L., Berglund, D.R., Glogoza, P.A., and Grafton, K.F. 2001. 2000 Dry Bean Grower Survey of Pest Problems and Pesticide Use in Minnesota and North Dakota. NDSU Extension Rpt. 72.

Lamey, H.A., Zollinger, R.K., McBride, D.K., Venette, R.C., and Venette, J.R. 1991. Production Problems and Practices of Northarvest Dry Bean Growers in 1989. N.D. Farm Res. 29(2):17-24.

Lamey, H.A., Zollinger, R.K., McMullen, M.P., Luecke, J.L., Grafton, K.F., Berglund, D.R., Venette, J.R., and Glogoza, P.A. 1996. 1994 Dry Bean Grower Survey of Pest Problems and Pesticide Use in Minnesota and North Dakota. NDSU Extension Rpt. 28.

Lamey, H.A., Zollinger, R.K., Venette, J.R., Berglund, D.R., Luecke, J.L., Grafton, K.F., and Glogoza, P.A. 1997. 1995 Dry Bean Grower Survey of Pest Problems and Pesticide Use in Minnesota and North Dakota. NDSU Extension Rpt. 33.

Lamey, H.A., Zollinger, R.K., Venette, J.R., McMullen, M.P., Luecke, J.L., Glogoza, P.A., Grafton, K.F., and Berglund, D.R. 1999. 1997 Dry Bean Grower Survey of Pest Problems and Pesticide Use in Minnesota and North Dakota. NDSU Extension Rpt. 47.

Lamey, H.A., Zollinger, R.K., McMullen, M.P., Luecke, J.L., Venette, J.R., Berglund, D.R., Grafton, K.F., and Glogoza, P.A. 1999. 1998 Dry Bean Grower Survey of Pest Problems and Pesticide Use in Minnesota and North Dakota. NDSU Extension Rpt. 58.

Lamey, H.A., Zollinger, R.K., McMullen, M.P., Luecke, J.L., Venette, J.R., Berglund, D.R., Grafton, K.F., and Glogoza, P.A. 2000. 1999 Dry Bean Grower Survey of Pest Problems and Pesticide Use in Minnesota and North Dakota. NDSU Extension Rpt. 64.

Venette, J.R., Lamey, H.A., Peterson, D.E., and Venette, R.C. 1989. Problems and Practices of Dry Edible Bean Production in North Dakota and Minnesota, 1987. N.D. Farm Res. 46(5):25-31.

APPENDIX I.

Please complete all requested information on practices, pest problems and pesticide use for your 2014 dry bean crop.

State	County	Acres
Minnesota	1.	
	2.	
	3.	
North Dakota	1.	
	2.	
	3.	
South Dakota	1.	
	2.	

Dry Bean Production in 2014	Acres
Total dry bean acres planted in 2014	
Total dry bean acres harvested	
Total irrigated acres	
Total dry bean acres on tile-drained ground	
Dry bean acres with hail damage	
Dry bean acres with frost damage	
Dry bean acres with excess water damage	

Dry Bean Production Problems in 2014 (please complete the table)		
Problem	**Acres Affected**	**Bean Class**
1. Applied herbicide injury		
*List herbicide in No. 1		
2. Herbicide drift injury		
3. Delayed planting		
4. Emergence/stand		
5. Harvest		
6. Disease		
7. Insects		
8. Weeds		
9. Micronutrient deficiency		
10. Excess water		
11. Hail damage		
12. Frost damage		
13. Drought		
14. Soil salinity		
15. Other (specify)		

Dry Beans Grown in 2014		
Bean Class	**Variety**	**Acres**
Black	GTS-1103	
	Condor	
	Eclipse	
	Jaguar	
	Loreto	
	T-39	
	Zorro	
	Other (specify)	
Great Northern	Aries	
	Orion	
	Other (specify)	
Kidney	Beluga	
	Cabernet	
	Cal Early LRK	
	Clouseau	
	Foxfire	
	Montcalm	
	Pink Panther	
	Red Hawk	
	Red Rover	
	Other (specify)	
Navy	Avalanche	
	Ensign	
	Medalist	
	Vigilanti	
	Merlin	
	Navigator	
	Norstar	
	T9905	
	Vista	
	Other (specify)	
Pink	Sedona	
	Floyd	
	Rosetta	
	Viva	
	Other (specify)	
	GTS 907	
	La Paz	
	Lariat	
	Mariah	
	Maverick	
	Medicine Hat	
	ND 307	
	Othello	
	Monterrey	
	Sequoia	
	Sinaloa	
	Sonora	
	Stampede	
	Windbreaker	
	Other (specify)	
Red	Merlot	
	Rio Roior	
	Other (specify)	
Other	Other (specify)	

Agronomy

Please list row spacing and plants per acre for each bean class that you planted in 2014.			
Class	**Row Spacing**	**Seeds Planted Per**	**Established Plants Per**

Please list crops in your dry bean crop rotation program for up to three fields planted to dry bean in 2014.			
Year	**Field 1**	**Field 2**	**Field 3**
2013			
2012			
2011			
2010			

Please list acreage for each tillage type listed below for your dry bean fields in 2014.	
Tillage Type	**Acreage**
Conventional	
Minimum	
Strip-till	
No-till	

Fertilizer Program for Dry Beans in 2014. Please indicate pounds per acre for fertilizer components and answer the questions.

Nitrogen	Phosphate	Potash	Zinc	Sulfur

Did you inoculate with Rhizobium?	**Yes**	**No**
Did you soil test prior to fertilizer application?	**Yes**	**No**
Did you use site-specific nutrient management for any fertilizers?	**Yes**	**No**

Harvest. Please circle one answer for each question.

What percentage of your dry bean crop was harvested using direct combining in 2014?

0% 1-25% 26-50% 51-75% 76-100%

Your estimated yield loss using direct combining?

0% 1-5% 6-10% 11-15% 16-20% N/A

Your estimated yield loss using conventional combining?

0% 1-5% 6-10% 11-15% 16-20% N/A

Insecticides and Insect Pests

Foliar Insecticides Used on Dry Beans in 2014. If you did not use a foliar insecticide, please write "0" for acres treated.		
Foliar Insecticide (write in name or number from the list below)	**Acres Treated**	**No. of Applications**

Foliar Insecticide Products

1. Acramite 4SC
2. Acephate/Orthene
3. Agri-Mek
4. Asana XL/Adjourn
5. Baythroid XL
6. Belt SC
7. Besiege
8. Blackhawk/Spintor 2SC
9. Brigade 2 EC
10. Brigadier/Swagger
11. Coragen
12. Declare/Proaxis
13. Dibrom 8 Emulsive
14. Dimethoate
15. Grizzly Z/Warrior II/Silencer/Lambda-Cy/Taiga
16. Hero
17. Intrepid 2F
18. Lannate LV
19. Leverage 360
20. Lorsban/generics
21. Malathion/Fyfanon
22. Mustang Maxx/Respect
23. Nuprid/Impulse/generics
24. Rimon (novluron)
25. Transform WG
26. Tombstone Helios/ Renounce 20WP
27. Other (please specify)
28. None used

Seed Treatment Insecticides Used on Dry Beans in 2014. If you did not use a seed treatment insecticide, please write "0" for acres treated.	
Seed Treatment Insecticide (write in name or number from the list below)	**Acres Treated**

Seed Treatment Insecticide Products

1. Attendant 600 FS / 600
2. Capture LFR
3. Cruiser 5FS
4. Cruiser Maxx
5. Dyna-Shield Imidacloprid 5
6. Enhance AW
7. Gaucho 600
8. Lorsban
9. None used
10. Other (please specify)
11. Don't know

Insecticides and Insect Pests
(Continued)

Worst Insect/Mite Problem in 2014. Please rank 1-3, with 1 = worst. Please mark ONLY three.	
Insect/Mite Pest	**Rank**
Armyworms	
Aphids	
Cutworms	
Bean leaf beetle	
Foliage caterpillars	
Grasshoppers	
Leafhoppers	
Seed corn maggots	
Spider mites	
Wireworms	
None	

Fungicides and Disease Problems

Foliar Fungicides Used on Dry Beans in 2014. If you did not use a foliar fungicide, please write "0" for acres treated.				
Foliar Fungicide (write in name or number from the list below)	**Acres Treated**	**No. of Applications**	**Application Method (circle one)**	
			air	ground
			air	ground
			air	ground
			air	ground
			air	ground
			air	ground
			air	ground

Foliar Fungicide Products

1. Aproach
2. Cannonball
3. Champion
4. Copper
5. Contans
6. Endura
7. Headline
8. Incognito
9. Microthiol
10. Omega
11. Priaxor
12. Proline
13. Proline (band)
14. Proline (broad)
15. ProPulse
16. Quadris/Amstar
17. Quadris Opti
18. Quilt
19. Rorval
20. Serenade
21. Switch
22. Tebuconazole/generics
23. Topsin (banded)
24. Topsin (broadcast)
25. Vertisan
26. Other (please specify)
27. None used

Fungicides and Disease Problems
(Continued)

Seed Treatment Fungicides Used on Dry Beans in 2014. If you did not use a seed treatment fungicide, please write "0" for acres treated.	
Seed Treatment Fungicide (write in name or number from the list below)	**Acres Treated**

Seed Treatment Fungicide Products

1. Apron
2. ApronMaxx
3. Captan
4. Dynasty
5. EverGol Energy
6. Headline
7. Maxim
8. Metalaxyl
9. Prevail
10. Rancona
11. Rancona Summit
12. Stamina
13. Spirato
14. Thiram
15. Trilex 2000
16. Trilex Summit
17. Vibrance
18. None used
19. Other (please specify)

Worst Disease Problem. Please rank 1-3, with 1 = worst. Please mark ONLY three.	
Disease	**Rank**
Anthracnose	
Common bacterial blights	
Bacterial brown spot	
Halo blight	
Bacterial wilt	
Bean common mosaic virus	
Other viruses (general)	
Root rot	
Rust	
White mold	
None	

Herbicides and Weed Problems

Weed Control Practices Used on Dry Beans in 2014. Count double herbicide applications, double cultivation, etc., as double acres.

Weed Control Used (write in name or number from the list below)	Bean Class	Acres Treated

Weed Control Products and Practices

1. Assure
2. Basagran/generics
3. BroadAxe
4. Dual/generics
5. Eptam
6. Eptam (spring)
7. Fusilade DX
8. Glyphosate (preplant)
9. Glyphosate (preharvest)
10. Glyphosate (postharvest)
11. Outlook
12. Permit
13. Poast
14. Prowl
15. Pursuit
16. Raptor
17. Reflex
18. Rezult
19. Select/generics
20. Sonalan
21. Spartan/Charge
22. Trifluralin
23. Cultivation
24. Rotary hoe
25. Manual labor
26. Other
27. None used

Worst Weed Problem. Please rank 1-3, with 1 = worst. Please mark ONLY three.

Weed	Rank	Weed	Rank
Biennial wormwood		Smartweed	
Black medic		Sunflower	
Canada thistle		Venice mallow	
Cocklebur		Volunteer canola	
Foxtail		Volunteer grain	
Kochia		Waterhemp	
Lambsquarters		Wild buckwheat	
Lanceleaf sage		Wild mustard	
Nightshade		Wild oat	
Ragweed		Other	
Redroot pigweed		None	

Dessicants Used on Dry Beans in 2014. Count double applications as double acres.

Dessicant Used (write in name or number from the list below)	Bean Class	Acres Treated

Dessicant Products

1. Glyphosate
2. Paraquat
3. Sharpen
4. Sodium chlorate (Leafex, Defol)
5. Valor

Field Scouting

Field Scouting in Dry Beans in 2014. For each question, please circle the best answer that applies to your operation.

How do you scout your dry bean fields for insects?

I do it Crop consultant Don't scout

How do you scout your dry bean fields for diseases?

I do it Crop consultant Don't scout

How do you scout your dry bean fields for weeds?

I do it Crop consultant Don't scout

Do you follow recommended economic thresholds when making insect control decisions?

Yes No

Thank you for completing the 2014 Dry Bean Grower Survey!

For more information on this and other topics, see www.ag.ndsu.edu

1M-2-08; 600-12-08; 600-6-09; 400-4-10; 400-2-11; 300-2-12; 400-2-13; 300-3-14; 400-3-15