

2011

# DRY BEAN Grower Survey

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*of Pest Problems  
and Pesticide Use*

*in Minnesota and North Dakota*



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*In cooperation with the Northarvest Bean Growers Association*

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# Introduction

The 2011 dry bean grower survey is the 22nd annual survey of varieties grown, pest problems, pesticide use and grower practices of the Northharvest 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 Northharvest Bean Growers Association developed the survey form (Appendix I). The survey was mailed to all Northharvest bean growers. All participants in the survey were anonymous.

Results of previous surveys dated 1987-1992, 1994-2000, 2002 and 2004-2010 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 Northharvest 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 2011, about 30 percent of the surveys were returned with no data because dry bean producers were not able to plant due to wet soil conditions.

In this year's report, figures have been added to accompany the tables. Data reported in the figures represent totals for the entire Northharvest survey unless otherwise noted. Data reported in the tables are broken down by state and also are totaled for the entire Northharvest survey.

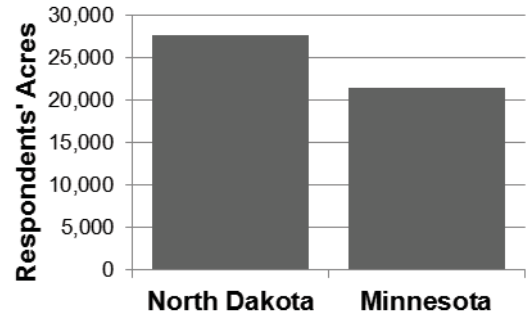
Throughout this report, trade names of chemicals often are used as an aid for clearer communication. Mention of trade names does not constitute endorsement or recommendation by North Dakota State University or the Northharvest Bean Growers Association.

# Production

**Table 1. Number of Northharvest dry bean growers responding, acres planted by respondents and total state acres in 2011.**

Growers	No. of respondents	Respondents' acres	Total acres <sup>a</sup>	Acres surveyed (% of total)
North Dakota	63	27,663	410,000	6.7
Minnesota	59	21,502	140,000	15.4
Northharvest	122	49,165	550,000	8.9

<sup>a</sup>Total of dry bean acres planted in Minnesota and North Dakota (source: USDA National Agricultural Statistics Service).



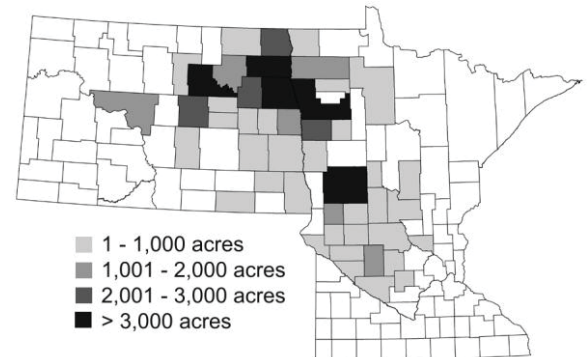
**Figure 1. Northharvest dry bean acres planted by state in 2011.**

**Table 2. Dry bean production by county in 2011.**

Minnesota	No. of respondents <sup>a</sup>	Acres <sup>b</sup>	North Dakota	No. of respondents <sup>a</sup>	Acres <sup>b</sup>
Polk	14	4,679	Benson	7	4,464
Otter Tail	7	3,760	Grand Forks	10	3,755
Norman	2	2,500	Walsh	12	3,471
Kandiyohi	5	1,945	Wells	3	2,540
Marshall	5	1,455	Pembina	7	2,109
Grant	3	1,105	Nelson	2	2,000
Swift	5	889	McLean	4	1,910
Mahnomen	3	810	Ramsey	4	1,593
Renville	5	768	Traill	4	1,083
Stevens	2	572	Eddy	2	815
Morrison	4	500	Griggs	2	765
Chippewa	2	407	Cass	2	656
Clay	2	353	Pierce	2	635
Beltrami	1	260	Barnes	2	450
Pope	2	253	Dickey	1	370
Crow Wing	1	170	Foster	1	300
McLeod	1	160	Richland	1	275
Stearns	1	150	Cavalier	1	208
Douglas	1	140	Kidder	1	135
Todd	1	130	Ransom	1	65
Kittson	1	115	Steele	1	64
Meeker	1	108	<b>Total</b>		<b>27,663</b>
Sherburne	1	105			
Wadena	1	63			
Pennington	1	60			
Big Stone	1	45			
<b>Total</b>		<b>21,502</b>			

<sup>a</sup>Some respondents had dry bean acreage in more than one county.

<sup>b</sup>Respondents' acres only.

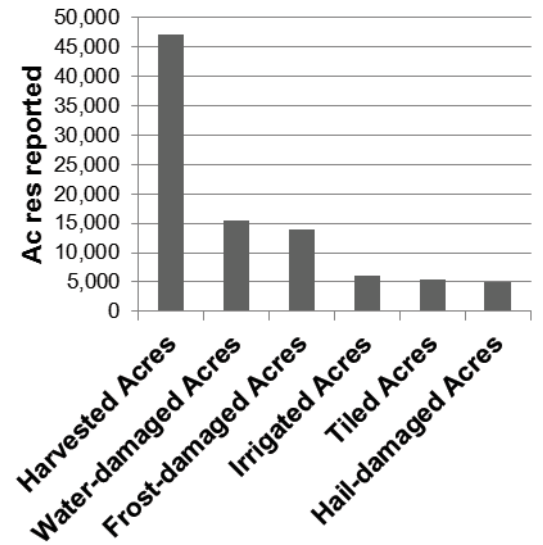


**Figure 2. Northharvest dry bean production by county in 2011.**

**Table 3. Dry bean acres harvested, irrigated, on tile-drained ground, and damaged by hail, frost and water in 2011.**

	Acres reported (no.) <sup>a</sup>	Acres reported (%) <sup>a</sup>
<b>Minnesota</b>		
Harvested	21,026	97.8
Frost-damaged	7,832	36.4
Water-damaged	6,789	31.6
Irrigated	5,901	27.4
Tile-drained	5,250	24.4
Hail-damaged	2,410	11.2
<b>North Dakota</b>		
Harvested	26,058	94.2
Water-damaged	8,668	31.3
Frost-damaged	6,123	22.1
Hail-damaged	2,676	9.7
Tile-drained	215	0.8
Irrigated	135	0.5
<b>Northharvest</b>		
Harvested	47,084	95.8
Water-damaged	15,457	31.4
Frost-damaged	13,955	28.4
Irrigated	6,036	12.3
Tile-drained	5,465	11.1
Hail-damaged	5,086	10.3

<sup>a</sup> Respondents' acres only.

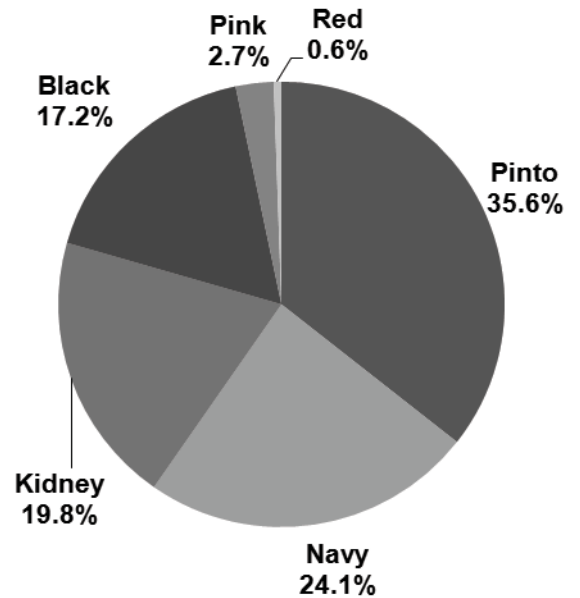


**Figure 3. Northharvest respondents' reported acres from Table 3.**

**Table 4. Dry bean market classes grown in 2011.**

Market class	Acres reported (no.) <sup>a</sup>	Acres reported (%) <sup>a</sup>
<b>Minnesota</b>		
Kidney	9,658	44.9
Navy	7,404	34.4
Pinto	1,956	9.1
Black	1,484	6.9
Pink	727	3.4
Red	273	1.3
<b>Total</b>	<b>21,502</b>	<b>100</b>
<b>North Dakota</b>		
Pinto	15,549	56.2
Black	6,991	25.3
Navy	4,433	16.0
Pink	625	2.3
Kidney	65	0.2
<b>Total</b>	<b>27,663</b>	<b>100</b>
<b>Northharvest</b>		
Pinto	17,505	35.6
Navy	11,837	24.1
Kidney	9,723	19.8
Black	8,475	17.2
Pink	1,352	2.7
Red	273	0.6
<b>Total</b>	<b>49,165</b>	<b>100</b>

<sup>a</sup> Respondents' acres only.



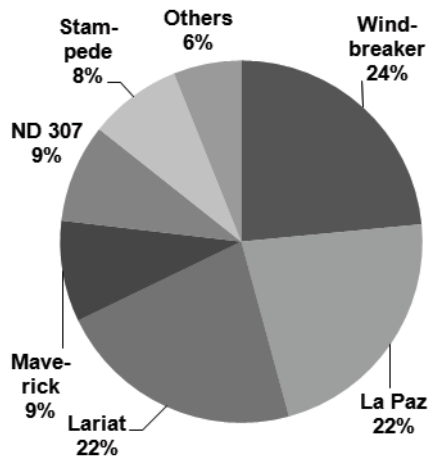
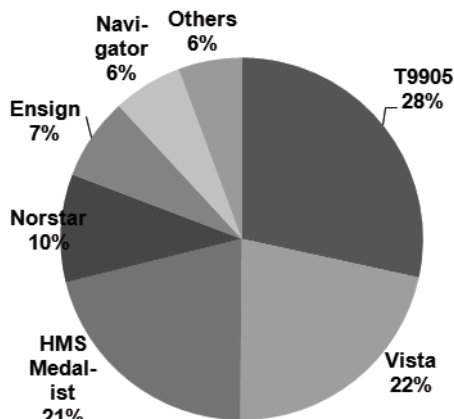
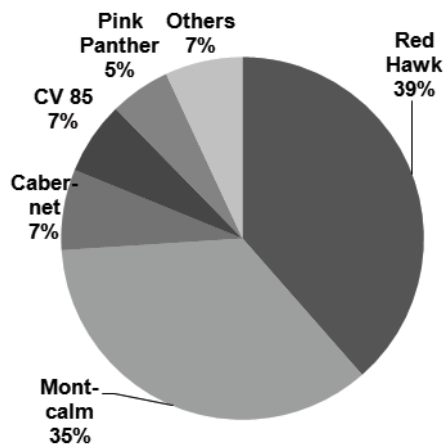
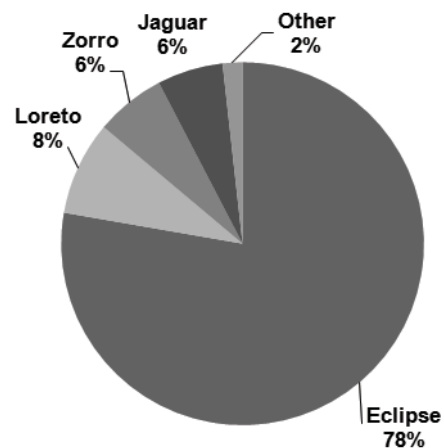
**Figure 4. Northharvest dry bean market classes grown in 2011.**

**Table 5. Dry bean varieties grown in 2011.**

Variety	Class	Acres planted <sup>a</sup>					
		Minnesota		North Dakota		Northharvest	
			% <sup>b</sup>		% <sup>b</sup>		% <sup>b</sup>
Eclipse	Black	757	3.5	5,831	21.1	6,588	13.4
Loreto	Black	0	0	710	2.6	710	1.4
Zorro	Black	230	1.1	300	1.1	530	1.1
Jaguar	Black	497	2.3	0	0	497	1.0
Not Specified	Black	0	0	150	0.5	150	0.3
<b>Total Black</b>	<b>Black</b>	<b>1,484</b>	<b>6.9</b>	<b>6,991</b>	<b>25.3</b>	<b>8,475</b>	<b>17.2</b>
Red Hawk	Kidney	3,747	17.4	0	0	3,747	7.6
Montcalm	Kidney	3,405	15.8	40	0.1	3,445	7.0
Cabernet	Kidney	700	3.3	0	0	700	1.4
CV 85	Kidney	633	2.9	0	0	633	1.3
Pink Panther	Kidney	525	2.4	0	0	525	1.1
Foxtire	Kidney	230	1.1	0	0	230	0.5
Red Rover	Kidney	145	0.7	25	0.1	170	0.3
Drake	Kidney	133	0.6	0	0	133	0.3
Cal Early LRK	Kidney	50	0.2	0	0	50	0.1
Chinook 2000	Kidney	50	0.2	0	0	50	0.1
Clouseau	Kidney	40	0.2	0	0	40	0.1
<b>Total Kidney</b>	<b>Kidney</b>	<b>9,658</b>	<b>44.9</b>	<b>65</b>	<b>0.2</b>	<b>9,723</b>	<b>19.8</b>
T9905	Navy	2,278	10.6	1,086	3.9	3,364	6.8
Vista	Navy	2,487	11.6	83	0.3	2,570	5.2
HMS Medalist	Navy	731	3.4	1,755	6.3	2,486	5.1
Norstar	Navy	955	4.4	188	0.7	1,143	2.3
Ensign	Navy	410	1.9	460	1.7	870	1.8
Navigator	Navy	183	0.9	551	2.0	734	1.5
Not specified	Navy	160	0.7	310	1.1	470	1.0
Avalanche	Navy	200	0.9	0	0	200	0.4
<b>Total Navy</b>	<b>Navy</b>	<b>7,404</b>	<b>34.4</b>	<b>4,433</b>	<b>16.0</b>	<b>11,837</b>	<b>23.8</b>
Floyd	Pink	203	0.9	625	2.3	828	1.7
Sedona	Pink	264	1.2	0	0	264	0.5
ISB 473	Pink	260	1.2	0	0	260	0.5
<b>Total Pink</b>	<b>Pink</b>	<b>727</b>	<b>3.4</b>	<b>625</b>	<b>2.3</b>	<b>1,352</b>	<b>2.7</b>
Windbreaker	Pinto	191	0.9	3,916	14.2	4,107	8.4
La Paz	Pinto	888	4.1	3,015	10.9	3,903	7.9
Lariat	Pinto	115	0.5	3,750	13.6	3,865	7.9
Maverick	Pinto	532	2.5	1,048	3.8	1,580	3.2
ND 307	Pinto	0	0	1,540	5.6	1,540	3.1
Stampede	Pinto	0	0	1,450	5.2	1,450	2.9
Medicine Hat	Pinto	0	0	290	1.0	290	0.6
V6023	Pinto	0	0	250	0.9	250	0.5
Buster	Pinto	230	1.1	0	0	230	0.5
Sonora	Pinto	0	0	150	0.5	150	0.3
Durango	Pinto	0	0	60	0.2	60	0.1
GTS 907	Pinto	0	0	40	0.1	40	0.1
Santa Fe	Pinto	0	0	40	0.1	40	0.1
<b>Total Pinto</b>	<b>Pinto</b>	<b>1,956</b>	<b>9.1</b>	<b>15,549</b>	<b>56.2</b>	<b>17,505</b>	<b>35.6</b>
Garnet	Small Red	273	1.3	0	0	273	0.6
<b>Total Red</b>	<b>Small Red</b>	<b>273</b>	<b>1.3</b>	<b>0</b>	<b>0</b>	<b>273</b>	<b>0.6</b>
<b>Grand Total</b>	<b>All Classes</b>	<b>21,502</b>	<b>100</b>	<b>27,663</b>	<b>100</b>	<b>49,165</b>	<b>100</b>

<sup>a</sup>Respondents' acres only.

<sup>b</sup>Percent of respondents' total dry bean acreage.



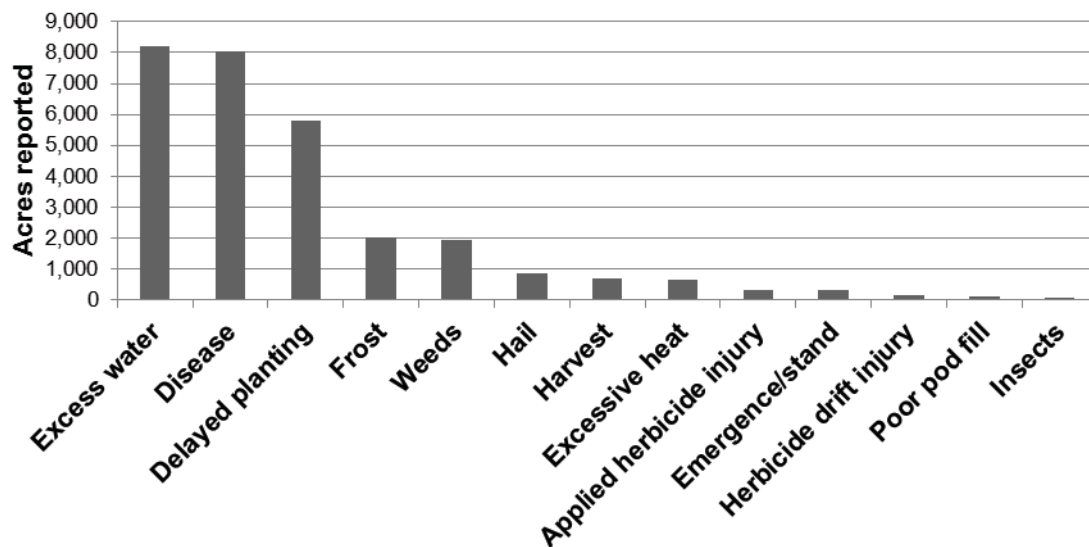
**Figures 5-8 (from top to bottom): major dry bean market classes grown by Northharvest survey respondents in 2011.**

- Black varieties (% acreage for class)
- Kidney varieties (% acreage for class)
- Navy varieties (% acreage for class)
- Pinto varieties (% acreage for class)

**Table 6. Worst dry bean production problem reported in 2011.**

Worst production problem	Respondents (no.)	Respondents (%)	Acres reported (no.) <sup>a</sup>	Acres reported (%) <sup>a</sup>
<b>Minnesota</b>				
Excess water	20	34.5	3,429	15.9
Disease	14	24.1	3,389	15.8
Delayed planting	6	10.3	3,018	14.0
Frost	5	8.6	1,440	6.7
Excessive heat	1	1.7	650	3.0
Hail	2	3.4	565	2.6
Weeds	4	6.9	302	1.4
Harvest	1	1.7	200	0.9
Applied herbicide injury	2	3.4	196	0.9
Emergence/stand	1	1.7	180	0.8
Herbicide drift injury	1	1.7	80	0.4
Insects	1	1.7	61	0.3
<b>Total</b>	<b>58</b>	<b>100</b>	<b>13,510</b>	<b>62.8</b>
<b>North Dakota</b>				
Excess water	23	36.5	4,762	17.2
Disease	12	19.0	4,659	16.8
Delayed planting	12	19.0	2,777	10.0
Weeds	6	9.5	1,635	5.9
Frost	3	4.8	590	2.1
Harvest	2	3.2	485	1.8
Hail	1	1.6	300	1.1
Emergence/stand	1	1.6	150	0.5
Applied herbicide injury	1	1.6	135	0.5
Poor pod fill	1	1.6	120	0.4
Herbicide drift injury	1	1.6	60	0.2
<b>Total</b>	<b>63</b>	<b>100</b>	<b>15,673</b>	<b>56.7</b>
<b>Northharvest</b>				
Excess water	43	35.5	8,191	16.7
Disease	26	21.5	8,048	16.4
Delayed planting	18	14.9	5,795	11.8
Frost	8	6.6	2,030	4.1
Weeds	10	8.3	1,937	3.9
Hail	3	2.5	865	1.8
Harvest	3	2.5	685	1.4
Excessive heat	1	0.8	650	1.3
Applied herbicide injury	3	2.5	331	0.7
Emergence/stand	2	1.7	330	0.7
Herbicide drift injury	2	1.7	140	0.3
Poor pod fill	1	0.8	120	0.2
Insects	1	0.8	61	0.1
<b>Total</b>	<b>121</b>	<b>100</b>	<b>29,183</b>	<b>59.4</b>

<sup>a</sup>Respondents' acres only.



**Figure 9. Northharvest respondents' reported acres for worst dry bean production problem in 2011.**

**Table 7. Row spacing by dry bean market class in 2011.**

Row spacing	Black		Kidney		Navy		Pink		Pinto		Red	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<b>Minnesota</b>												
< 11 inches	1	11.1	1	4.5	2	6.7	0	0	1	16.7	0	0
11 to 15 inches	5	55.6	0	0	2	6.7	0	0	0	0	0	0
16 to 20 inches	0	0	1	4.5	2	6.7	0	0	0	0	0	0
21 to 25 inches	0	0	6	27.3	21	70	2	40	1	16.7	1	100
26 to 30 inches	3	33.3	13	59.1	3	10	3	60	4	66.7	0	0
> 30 inches	0	0	1	4.5	0	0	0	0	0	0	0	0
<b>Total</b>	<b>9</b>	<b>100</b>	<b>22</b>	<b>100</b>	<b>30</b>	<b>100</b>	<b>5</b>	<b>100</b>	<b>6</b>	<b>100</b>	<b>1</b>	<b>100</b>
<b>North Dakota</b>												
< 11 inches	1	5.6	0	0	1	7.1	0	0	1	2.3	0	0
11 to 15 inches	3	16.7	0	0	0	0	0	0	7	16.3	0	0
16 to 20 inches	1	5.6	0	0	0	0	0	0	1	2.3	0	0
21 to 25 inches	6	33.3	0	0	7	50	0	0	9	20.9	0	0
26 to 30 inches	6	33.3	1	100	6	42.9	2	100	25	58.1	0	0
> 30 inches	1	5.6	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>18</b>	<b>100</b>	<b>1</b>	<b>100</b>	<b>14</b>	<b>100</b>	<b>2</b>	<b>100</b>	<b>43</b>	<b>100</b>	<b>0</b>	<b>0</b>
<b>Northharvest</b>												
< 11 inches	2	7.4	1	4.3	3	6.8	0	0	2	4.1	0	0
11 to 15 inches	8	29.6	0	0	2	4.5	0	0	7	14.3	0	0
16 to 20 inches	1	3.7	1	4.3	2	4.5	0	0	1	2.0	0	0
21 to 25 inches	6	22.2	6	26.1	28	63.6	2	28.6	10	20.4	1	100
26 to 30 inches	9	33.3	14	60.9	9	20.5	5	71.4	29	59.2	0	0
> 30 inches	1	3.7	1	4.3	0	0	0	0	0	0	0	0
<b>Total</b>	<b>27</b>	<b>100</b>	<b>23</b>	<b>100</b>	<b>44</b>	<b>100</b>	<b>7</b>	<b>100</b>	<b>49</b>	<b>100</b>	<b>1</b>	<b>100</b>

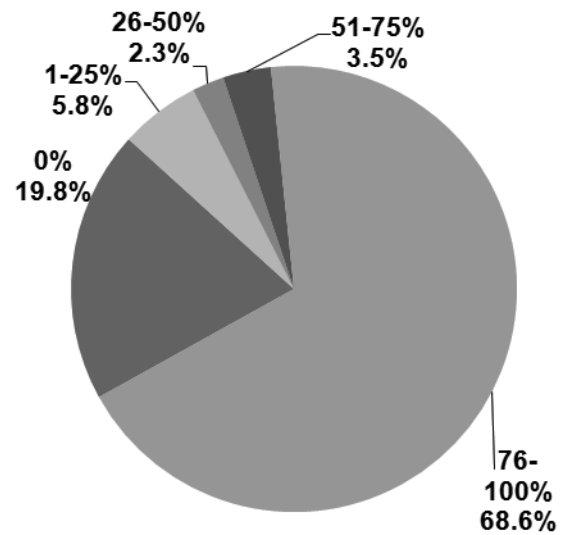
**Table 8. Seeding rate by dry bean market class in 2011.**

Seeding rate <sup>a</sup>	Black		Kidney		Navy		Pink		Pinto		Red	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<b>Minnesota</b>												
< 70,000	1	11.1	2	9.1	1	3.3	1	20	2	33.3	0	0
70 to 79,000	0	0	11	50	1	3.3	2	40	2	33.3	0	0
80 to 89,000	0	0	7	31.8	0	0	1	20	1	16.7	1	100
90 to 99,000	1	11.1	2	9.1	4	13.3	1	20	1	16.7	0	0
100 to 109,000	3	33.3	0	0	8	26.7	0	0	0	0	0	0
110 to 119,000	1	11.1	0	0	9	30	0	0	0	0	0	0
120 to 129,000	2	22.2	0	0	4	13.3	0	0	0	0	0	0
> 129,000	1	11.1	0	0	3	10	0	0	0	0	0	0
<b>Total</b>	<b>9</b>	<b>100</b>	<b>22</b>	<b>100</b>	<b>30</b>	<b>100</b>	<b>5</b>	<b>100</b>	<b>6</b>	<b>100</b>	<b>1</b>	<b>100</b>
<b>North Dakota</b>												
< 70,000	1	5.9	0	0	0	0	0	0	14	34.1	0	0
70 to 79,000	1	5.9	1	100	0	0	2	100	17	41.5	0	0
80 to 89,000	0	0	0	0	0	0	0	0	7	17.1	0	0
90 to 99,000	4	23.5	0	0	2	15.4	0	0	3	7.3	0	0
100 to 109,000	8	47.1	0	0	4	30.8	0	0	0	0	0	0
110 to 119,000	2	11.8	0	0	2	15.4	0	0	0	0	0	0
120 to 129,000	0	0	0	0	3	23.1	0	0	0	0	0	0
> 129,000	1	5.9	0	0	2	15.4	0	0	0	0	0	0
<b>Total</b>	<b>17</b>	<b>100</b>	<b>1</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>2</b>	<b>100</b>	<b>41</b>	<b>100</b>	<b>0</b>	<b>0</b>
<b>Northharvest</b>												
< 70,000	2	7.7	2	8.7	1	2.3	1	14.3	16	34.0	0	0
70 to 79,000	1	3.8	12	52.2	1	2.3	4	57.1	19	40.4	0	0
80 to 89,000	0	0	7	30.4	0	0	1	14.3	8	17.0	1	100
90 to 99,000	5	19.2	2	8.7	6	14.0	1	14.3	4	8.5	0	0
100 to 109,000	11	42.3	0	0	12	27.9	0	0	0	0	0	0
110 to 119,000	3	11.5	0	0	11	25.6	0	0	0	0	0	0
120 to 129,000	2	7.7	0	0	7	16.3	0	0	0	0	0	0
> 129,000	2	7.7	0	0	5	11.6	0	0	0	0	0	0
<b>Total</b>	<b>26</b>	<b>100</b>	<b>23</b>	<b>100</b>	<b>43</b>	<b>100</b>	<b>7</b>	<b>100</b>	<b>47</b>	<b>100</b>	<b>1</b>	<b>100</b>

<sup>a</sup>Live seeds per acre.

**Table 9. Percent of total dry bean acres harvested by direct combining in 2011.**

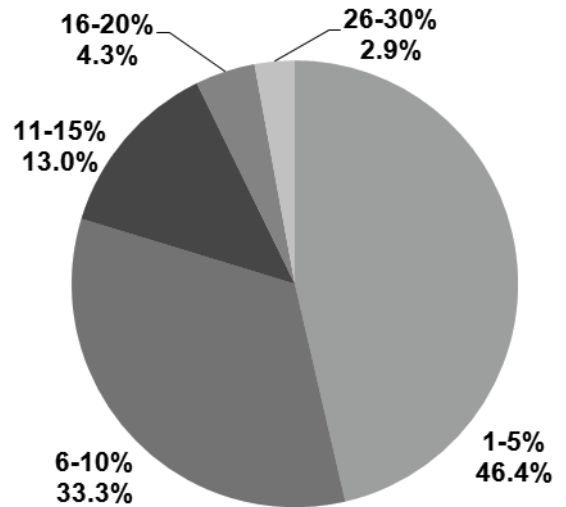
Percent direct combined	Respondents (no.)	Respondents (%)
<b>Minnesota</b>		
0%	7	18.9
1-25%	2	5.4
26-50%	1	2.7
51-75%	3	8.1
76-100%	24	64.9
<b>Total</b>	<b>37</b>	<b>100</b>
<b>North Dakota</b>		
0%	10	20.4
1-25%	3	6.1
26-50%	1	2.0
51-75%	0	0
76-100%	35	71.4
<b>Total</b>	<b>49</b>	<b>100</b>
<b>Northarvest</b>		
0%	17	19.8
1-25%	5	5.8
26-50%	2	2.3
51-75%	3	3.5
76-100%	59	68.6
<b>Total</b>	<b>86</b>	<b>100</b>



**Figure 10. Northarvest percent acres harvested by direct combining in 2011.**

**Table 10. Estimated yield loss in direct-harvested dry bean in 2011.**

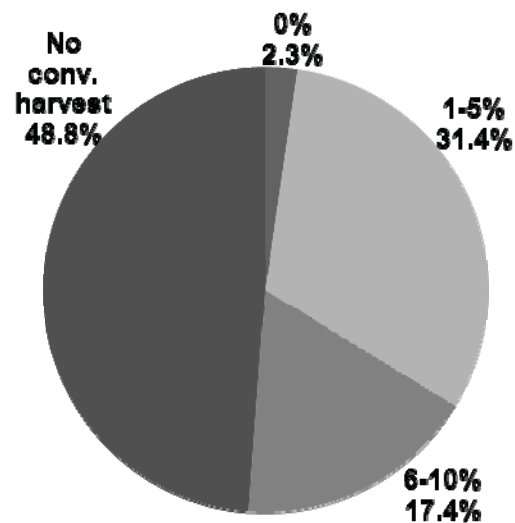
Estimated yield loss	Respondents (no.)	Respondents (%)
<b>Minnesota</b>		
1-5%	17	56.7
6-10%	9	30
11-15%	2	6.7
16-20%	1	3.3
26-30%	1	3.3
<b>Total</b>	<b>30</b>	<b>100</b>
<b>North Dakota</b>		
1-5%	15	38.5
6-10%	14	35.9
11-15%	7	17.9
16-20%	2	5.1
26-30%	1	2.6
<b>Total</b>	<b>39</b>	<b>100</b>
<b>Northarvest</b>		
1-5%	32	46.4
6-10%	23	33.3
11-15%	9	13.0
16-20%	3	4.3
26-30%	2	2.9
<b>Total</b>	<b>69</b>	<b>100</b>



**Figure 11. Northarvest estimated yield loss in direct-harvested dry bean in 2011.**

**Table 11. Estimated yield loss in conventionally harvested dry bean in 2011.**

Estimated yield loss	Respondents (no.)	Respondents (%)
<b>Minnesota</b>		
0%	0	0
1-5%	13	35.1
6-10%	7	18.9
No conv. harvest	17	45.9
<b>Total</b>	<b>37</b>	<b>100</b>
<b>North Dakota</b>		
0%	2	4.1
1-5%	14	28.6
6-10%	8	16.3
No conv. harvest	25	51.0
<b>Total</b>	<b>49</b>	<b>100</b>
<b>Northharvest</b>		
0%	2	2.3
1-5%	27	31.4
6-10%	15	17.4
No conv. harvest	42	48.8
<b>Total</b>	<b>86</b>	<b>100</b>



**Figure 12. Northharvest estimated yield loss in conventionally-harvested dry bean in 2011.**

**Table 12. Type II dry bean row spacing by dry bean market class in 2011.**

Row spacing	Black		Navy		Pinto	
	Respondents (no.)	Respondents (%)	Respondents (no.)	Respondents (%)	Respondents (no.)	Respondents (%)
<b>Minnesota</b>						
< 11 inches	1	11.1	2	6.7	1	16.7
11 to 15 inches	0	0	2	6.7	0	0
16 to 20 inches	0	0	2	6.7	0	0
21 to 25 inches	5	55.6	21	70	1	16.7
26 to 30 inches	3	33.3	3	10	4	66.7
> 30 inches	0	0	0	0	0	0
<b>Total</b>	<b>9</b>	<b>100</b>	<b>30</b>	<b>100</b>	<b>6</b>	<b>100</b>
<b>North Dakota</b>						
< 11 inches	1	5.6	1	7.1	1	2.3
11 to 15 inches	3	16.7	0	0	7	16.3
16 to 20 inches	1	5.6	0	0	1	2.3
21 to 25 inches	6	33.3	7	50	9	20.9
26 to 30 inches	6	33.3	6	42.9	25	58.1
> 30 inches	1	5.6	0	0	0	0
<b>Total</b>	<b>18</b>	<b>100</b>	<b>14</b>	<b>100</b>	<b>43</b>	<b>100</b>
<b>Northharvest</b>						
< 11 inches	2	7.4	3	6.8	2	4.1
11 to 15 inches	3	11.1	2	4.5	7	14.3
16 to 20 inches	1	3.7	2	4.5	1	2.0
21 to 25 inches	11	40.7	28	63.6	10	20.4
26 to 30 inches	9	33.3	9	20.5	29	59.2
> 30 inches	1	3.7	0	0	0	0
<b>Total</b>	<b>27</b>	<b>100</b>	<b>44</b>	<b>100</b>	<b>49</b>	<b>100</b>

**Table 13. Type II dry bean seeding rate by dry bean market class in 2011.**

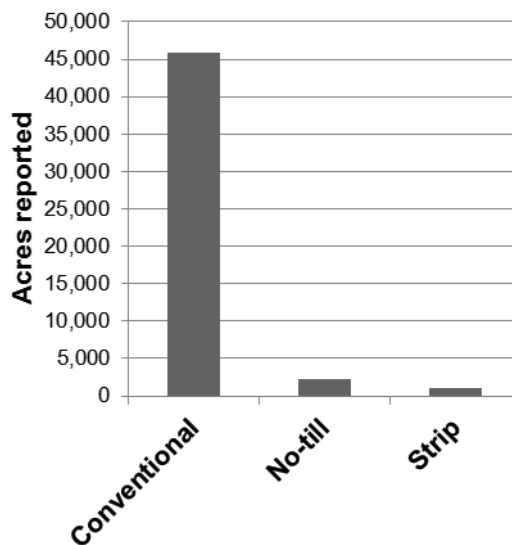
Seeding rate <sup>a</sup>	Black		Navy		Pinto	
	Respondents (no.)	Respondents (%)	Respondents (no.)	Respondents (%)	Respondents (no.)	Respondents (%)
<b>Minnesota</b>						
< 70,000	1	11.1	1	3.3	2	33.3
70 to 79,000	0	0	1	3.3	2	33.3
80 to 89,000	0	0	0	0	1	16.7
90 to 99,000	1	11.1	4	13.3	1	16.7
100 to 109,000	3	33.3	8	26.7	0	0
110 to 119,000	1	11.1	9	30	0	0
120 to 129,000	2	22.2	4	13.3	0	0
> 129,000	1	11.1	3	10	0	0
<b>Total</b>	<b>9</b>	<b>100</b>	<b>30</b>	<b>100</b>	<b>6</b>	<b>100</b>
<b>North Dakota</b>						
< 70,000	1	5.9	0	0	4	19.0
70 to 79,000	1	5.9	0	0	7	33.3
80 to 89,000	0	0	0	0	7	33.3
90 to 99,000	4	23.5	2	15.4	3	14.3
100 to 109,000	8	47.1	4	30.8	0	0
110 to 119,000	2	11.8	2	15.4	0	0
120 to 129,000	0	0	3	23.1	0	0
> 129,000	1	5.9	2	15.4	0	0
<b>Total</b>	<b>17</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>21</b>	<b>100</b>
<b>Northharvest</b>						
< 70,000	2	7.7	1	2.3	6	22.2
70 to 79,000	1	3.8	1	2.3	9	33.3
80 to 89,000	0	0	0	0	8	29.6
90 to 99,000	5	19.2	6	14.0	4	14.8
100 to 109,000	11	42.3	12	27.9	0	0
110 to 119,000	3	11.5	11	25.6	0	0
120 to 129,000	2	7.7	7	16.3	0	0
> 129,000	2	7.7	5	11.6	0	0
<b>Total</b>	<b>26</b>	<b>100</b>	<b>43</b>	<b>100</b>	<b>27</b>	<b>100</b>

<sup>a</sup>Live seeds per acre.

**Table 14. Dry bean field tillage practices in 2011.**

Tillage practice	Acres reported (no.) <sup>a</sup>	Acres reported (%) <sup>a</sup>
<b>Minnesota</b>		
Conventional	21,211	98.6
Strip tillage	291	1.4
No-till	0	0
<b>Total</b>	<b>21,502</b>	<b>100</b>
<b>North Dakota</b>		
Conventional	24,583	88.9
Strip tillage	800	2.9
No-till	2,280	8.2
<b>Total</b>	<b>27,663</b>	<b>100</b>
<b>Northharvest</b>		
Conventional	45,794	93.1
Strip tillage	1,091	2.2
No-till	2,280	4.6
<b>Total</b>	<b>49,165</b>	<b>100</b>

<sup>a</sup>Respondents' acres only.

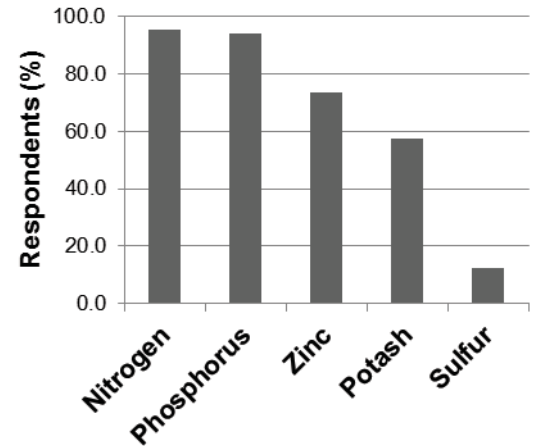


**Figure 13. Northharvest dry bean field tillage practices in 2011.**

# Agronomy

**Table 15. Use of fertilizers on dry bean fields in 2011.**

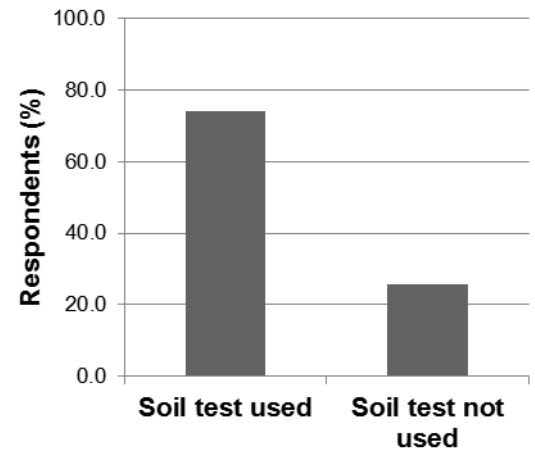
Fertilizer	Respondents (no.)	Respondents (%)
<b>Minnesota</b>		
Nitrogen	51	100
Phosphorus	50	98.0
Potash	44	86.3
Zinc	39	76.5
Sulfur	8	15.7
<b>North Dakota</b>		
Nitrogen	50	90.9
Phosphorus	50	90.9
Zinc	39	70.9
Potash	17	30.9
Sulfur	5	9.1
<b>Northharvest</b>		
Nitrogen	101	95.3
Phosphorus	100	94.3
Zinc	78	73.6
Potash	61	57.5
Sulfur	13	12.3



**Figure 14. Northharvest use of fertilizers on dry bean fields in 2011.**

**Table 16. Use of soil test prior to fertilization of dry bean fields in 2011.**

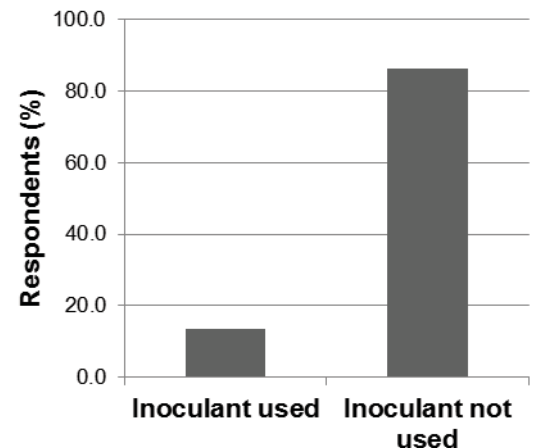
Soil test	Respondents (no.)	Respondents (%)
<b>Minnesota</b>		
Soil test used	43	81.1
Soil test not used	10	18.9
<b>Total</b>	<b>53</b>	<b>100</b>
<b>North Dakota</b>		
Soil test used	38	67.9
Soil test not used	18	32.1
<b>Total</b>	<b>56</b>	<b>100</b>
<b>Northharvest</b>		
Soil test used	81	74.3
Soil test not used	28	25.7
<b>Total</b>	<b>109</b>	<b>100</b>



**Figure 15. Northharvest use of soil test in 2011.**

**Table 17. Use of *Rhizobium* inoculants on dry bean fields in 2011.**

<i>Rhizobium</i> use	Respondents (no.)	Respondents (%)
<b>Minnesota</b>		
Inoculant used	5	9
Inoculant not used	48	91
<b>Total</b>	<b>53</b>	<b>10</b>
<b>North Dakota</b>		
Inoculant used	10	17.5
Inoculant not used	47	82.5
<b>Total</b>	<b>57</b>	<b>100</b>
<b>Northharvest</b>		
Inoculant used	15	13.6
Inoculant not used	95	86.4
<b>Total</b>	<b>110</b>	<b>100</b>

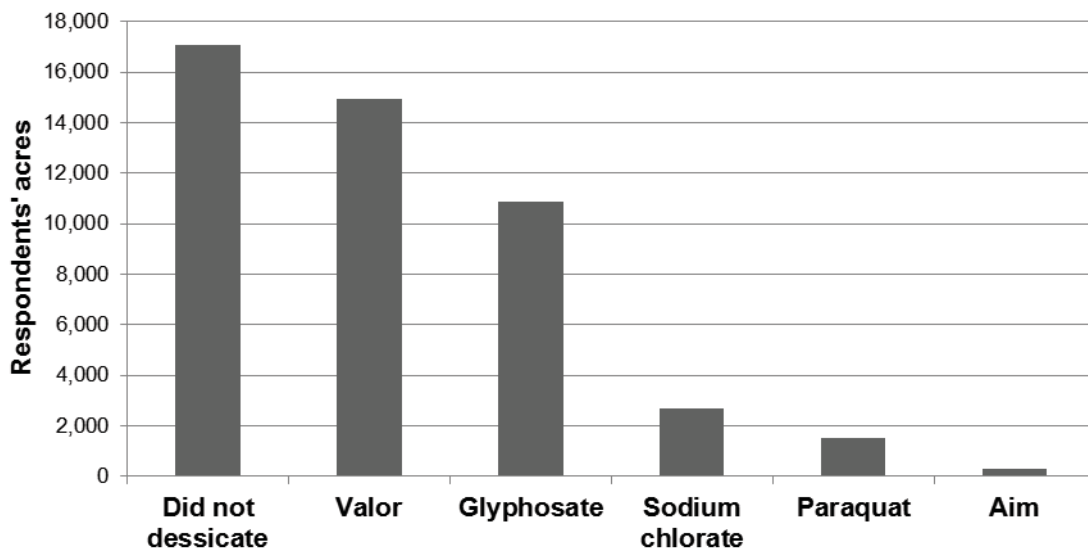


**Figure 16. Northharvest use of inoculant in 2011.**

**Table 18. Dessicants used on dry bean in 2011.**

Dessicant	Respondents (no.)	Respondents (%)	Acres reported (no.) <sup>a</sup>	Acres reported (%) <sup>a</sup>
<b>Minnesota</b>				
Valor	36	47.4	7,692	38.8
Did not dessicate	18	23.7	7,081	35.7
Glyphosate	13	17.1	2,997	15.1
Sodium chlorate	4	5.3	1,114	5.6
Paraquat	4	5.3	635	3.2
Aim	1	1.3	300	1.5
<b>North Dakota</b>				
Did not dessicate	23	28.4	10,008	36.3
Glyphosate	26	32.1	7,872	28.6
Valor	23	28.4	7,228	26.2
Sodium chlorate	5	6.2	1,555	5.6
Paraquat	4	4.9	890	3.2
Aim	0	0	0	0
<b>Northarvest</b>				
Did not dessicate	41	26.1	17,089	36.1
Valor	59	37.6	14,920	31.5
Glyphosate	39	24.8	10,869	22.9
Sodium chlorate	9	5.7	2,669	5.6
Paraquat	8	5.1	1,525	3.2
Aim	1	0.6	300	0.6

<sup>a</sup>Respondents' acres only.



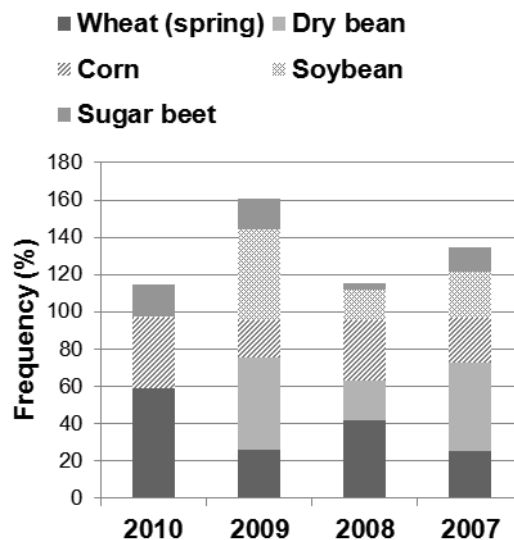
**Figure 17. Northarvest dessicants used on dry bean in 2011.**

**Table 19. Frequency of crops in dry bean crop rotation program, 2007-2010.**

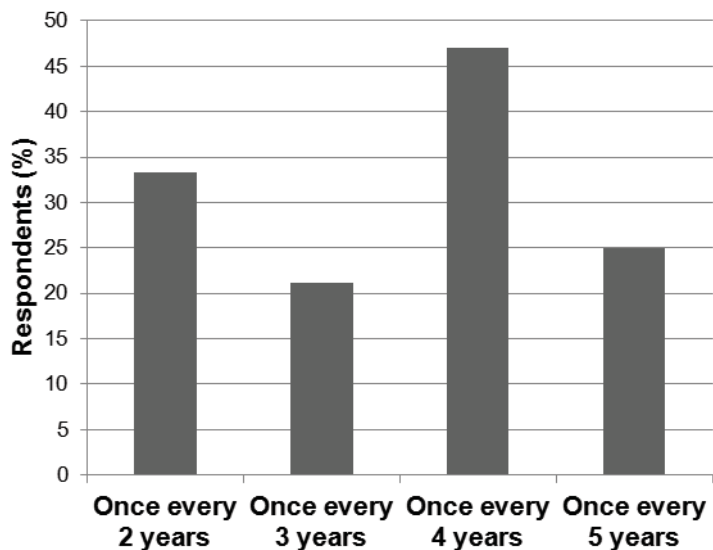
Crop	2010	2009	2008	2007	Average
	Respon- dents (%)	Respon- dents (%)	Respon- dents (%)	Respon- dents (%)	Respon- dents (%)
<b>Minnesota</b>					
Corn	50.9	40.4	43.1	30.6	41.3
Soybean	1.8	59.6	21.6	26.5	27.4
Wheat (spring)	35.1	19.2	21.6	24.5	25.1
Dry bean	0	21.2	25.5	34.7	20.4
Sugar beet	19.3	21.2	5.9	14.3	15.2
Potato	7.0	5.8	2.0	6.1	5.2
Hay	1.8	1.9	2.0	2.0	1.9
Barley	3.5	0	2.0	2.0	1.9
Canola/rape	0	1.9	0	0	0.5
Field pea	0	1.9	0	0	0.5
Oats	0	0	0	2.0	0.5
<b>North Dakota</b>					
Wheat (spring)	82.8	32.7	61.5	26.0	50.8
Dry bean	0	76.4	17.3	60	38.4
Soybean	0	38.2	11.5	22.0	17.9
Corn	24.1	0	21.2	18.0	15.8
Sugar beet	15.5	12.7	1.9	12.0	10.5
Barley	12.1	5.5	7.7	0	6.3
Potato	0	7.3	1.9	0	2.3
Sunflower	0	5.5	3.8	0	2.3
Canola/rape	1.7	1.8	0	2.0	1.4
Field pea	0	1.8	0	0	0.5
<b>Northarvest</b>					
Wheat (spring)	59.1	26.2	41.7	25.3	38.1
Dry bean	0	49.5	21.4	47.5	29.6
Corn	37.4	19.6	32.0	24.2	28.3
Soybean	0.9	48.6	16.5	24.2	22.6
Sugar beet	17.4	16.8	3.9	13.1	12.8
Barley	7.8	2.8	4.9	1.0	4.1
Potato	3.5	6.5	1.9	3.0	3.7
Sunflower	0	2.8	1.9	0	1.2
Hay	0.9	0.9	1.0	1.0	1.0
Canola/rape	0.9	1.9	0	1.0	1.0
Field pea	0	1.9	0	0	0.5
Oats	0	0	0	1.0	0.3

**Table 20. Number of years dry bean is grown in dry bean crop rotation program.**

Number of years	Respondents (%)
<b>Minnesota</b>	
Once every 2 years	18.9
Once every 3 years	25.0
Once every 4 years	34.0
Once every 5 years	36.0
<b>North Dakota</b>	
Once every 2 years	47.3
Once every 3 years	17.3
Once every 4 years	60
Once every 5 years	14.0
<b>Northarvest</b>	
Once every 2 years	33.3
Once every 3 years	21.2
Once every 4 years	47.0
Once every 5 years	25.0



**Figure 18. Northharvest frequency of major crops in dry bean crop rotation program, 2007-2010.**



**Figure 19. Northharvest number of years dry bean is grown in dry bean crop rotation program.**

# Insect Pests and Insecticide Use

Table 21. Worst insect problem in dry bean in 2011.

Insect <sup>a</sup>	Respondents (no.)	Respondents (%)	Acres reported (no.) <sup>b</sup>	Acres reported (%) <sup>b</sup>
<b>Minnesota</b>				
None	26	44.1	9,770	45.4
Leafhoppers	20	33.9	6,712	31.2
Seedcorn Maggot	4	6.8	1,715	8.0
Aphids	4	6.8	1,028	4.8
Bean Leaf Beetle	1	1.7	800	3.7
Wireworms	1	1.7	730	3.4
Grasshoppers	2	3.4	700	3.3
Cutworms	1	1.7	47	0.2
<b>Total</b>	<b>59</b>	<b>100</b>	<b>21,502</b>	<b>100</b>
<b>North Dakota</b>				
None	46	73.0	18,315	66.2
Wireworms	5	7.9	2,833	10.2
Seedcorn Maggot	2	3.2	2,420	8.7
Cutworms	4	6.3	2,350	8.5
Leafhoppers	3	4.8	985	3.6
Grasshoppers	2	3.2	390	1.4
Aphids	1	1.6	370	1.3
Bean Leaf Beetle	0	0	0	0
<b>Total</b>	<b>63</b>	<b>100</b>	<b>27,663</b>	<b>100</b>
<b>Northarvest</b>				
None	72	59.0	28,085	57.1
Leafhoppers	23	18.9	7,697	15.7
Seedcorn Maggot	6	4.9	4,135	8.4
Wireworms	6	4.9	3,563	7.2
Cutworms	5	4.1	2,397	4.9
Aphids	5	4.1	1,398	2.8
Grasshoppers	4	3.3	1,090	2.2
Bean Leaf Beetle	1	0.8	800	1.6
<b>Total</b>	<b>122</b>	<b>100</b>	<b>49,165</b>	<b>100</b>

<sup>a</sup>Ranked as No. 1 insect problem by respondents.

<sup>b</sup>Respondents' acres only.

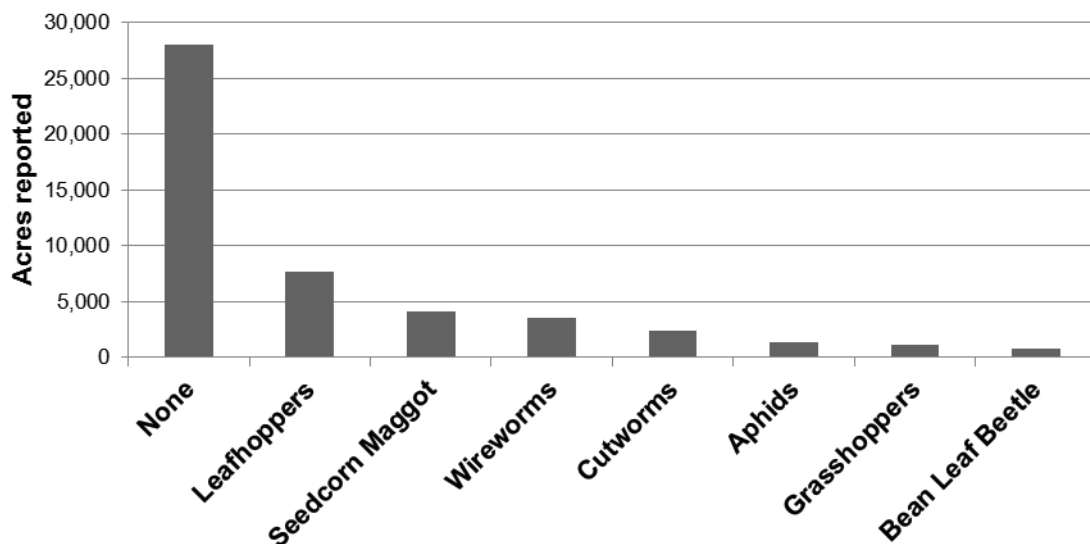


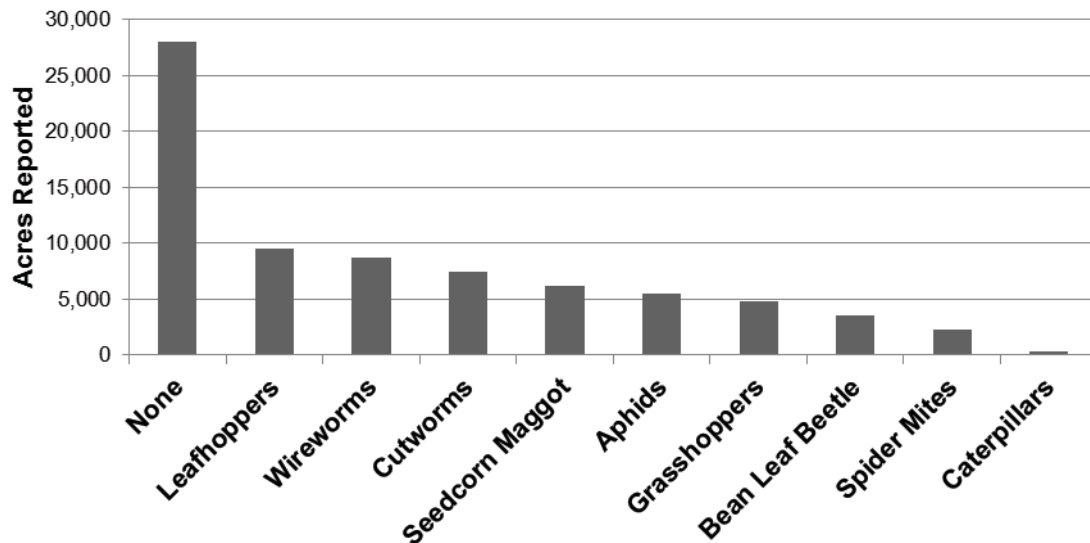
Figure 20. Northarvest worst insect problem in dry bean in 2011.

**Table 22. Insects ranked as one of the three worst in dry bean in 2011.**

Insect <sup>a</sup>	Respondents (no.)	Respondents (%)	Acres reported (no.) <sup>b</sup>	Acres reported (%) <sup>b</sup>
<b>Minnesota</b>				
None	26	44.1	9,770	45.4
Leafhoppers	25	42.4	8,494	39.5
Aphids	10	16.9	3,311	15.4
Bean Leaf Beetle	6	10.2	3,215	15.0
Cutworms	8	13.6	3,227	15.0
Wireworms	6	10.2	2,403	11.2
Spider Mites	6	10.2	2,145	10
Seedcorn Maggot	5	8.5	1,855	8.6
Grasshoppers	5	8.5	1,420	6.6
<b>North Dakota</b>				
None	46	73.0	18,315	66.2
Wireworms	10	15.9	6,283	22.7
Seedcorn Maggot	5	7.9	4,310	15.6
Cutworms	9	14.3	4,258	15.4
Grasshoppers	6	9.5	3,410	12.3
Aphids	5	7.9	2,148	7.8
Leafhoppers	3	4.8	985	3.6
Bean Leaf Beetle	1	1.6	370	1.3
Caterpillars	1	1.6	370	1.3
Spider Mites	1	1.6	135	0.5
<b>Northharvest</b>				
None	72	59.0	28,085	57.1
Leafhoppers	28	23.0	9,479	19.3
Wireworms	16	13.1	8,686	17.7
Cutworms	17	13.9	7,485	15.2
Seedcorn Maggot	10	8.2	6,165	12.5
Aphids	15	12.3	5,459	11.1
Grasshoppers	11	9.0	4,830	9.8
Bean Leaf Beetle	7	5.7	3,585	7.3
Spider Mites	7	5.7	2,280	4.6
Caterpillars	1	0.8	370	0.8

<sup>a</sup>Ranked as No. 1, 2 or 3 insect problem by respondents.

<sup>b</sup>Respondents' acres only.



**Figure 21. Northharvest insects ranked as one of the three worst in dry bean in 2011.**

**Table 23. Foliar insecticide use in dry bean in 2011.**

Insecticide	Respon- dents (no.)	Respon- dents (%)	Acres reported (no.) <sup>a,b</sup>	Acres reported (%) <sup>a,b</sup>
<b>Minnesota</b>				
Tombstone	3	5.1	2,854	13.3
Asana XL	7	11.9	1,993	9.3
Dimethoate	1	1.7	320	1.5
Warrior II	1	1.7	315	1.5
Adjourn	1	1.7	306	1.4
Mustang Max	1	1.7	68	0.3
None	45	76.3	16,633	77.4
<b>Insecticide Total</b>	<b>14</b>	<b>23.7</b>	<b>5,856</b>	<b>27.2</b>
<b>North Dakota</b>				
Warrior II	2	3.2	1,105	4.0
Asana XL	1	1.6	250	0.9
Baythroid XL	1	1.6	51	0.2
None	59	93.7	26,403	95.4
<b>Insecticide Total</b>	<b>4</b>	<b>6.4</b>	<b>1,406</b>	<b>5.1</b>
<b>Northharvest</b>				
Tombstone	3	2.5	2,854	5.8
Asana XL	8	6.6	2,243	4.6
Warrior II	3	2.5	1,420	2.9
Dimethoate	1	0.8	320	0.7
Adjourn	1	0.8	306	0.6
Mustang Max	1	0.8	68	0.1
Baythroid XL	1	0.8	51	0.1
None	104	85.2	43,036	87.5
<b>Insecticide Total</b>	<b>18</b>	<b>14.8</b>	<b>7,253</b>	<b>14.8</b>

<sup>a</sup>Respondents' acres only.

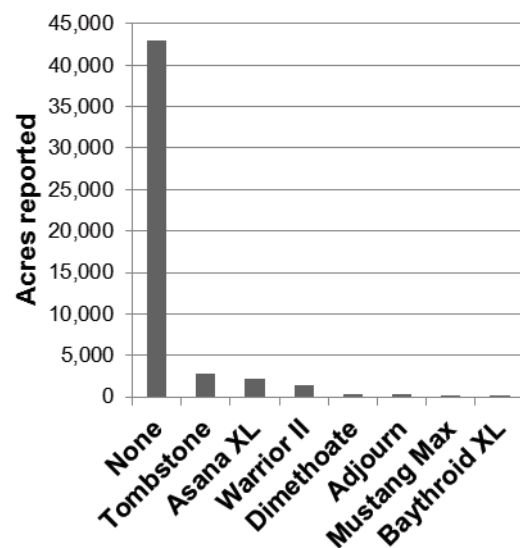
<sup>b</sup>Percentages do not total 100 percent because some respondents treated more than once with the same product and/or treated the same acreage with more than one product.

**Table 24. Insecticide seed treatment use in dry bean in 2011.**

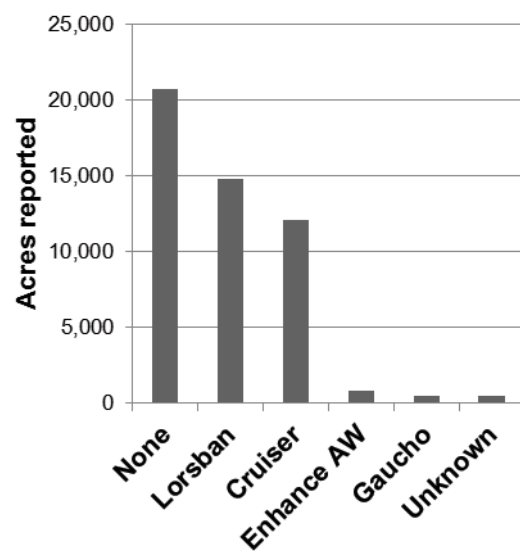
Seed Treatment	Respon- dents (no.)	Respon- dents (%)	Acres reported (no.) <sup>a,b</sup>	Acres reported (%) <sup>a,b</sup>
<b>Minnesota</b>				
Lorsban	19	32.2	8,567	39.8
Cruiser	20	33.9	6,918	32.2
Unknown	1	1.7	300	1.4
Gaucho	2	3.4	187	0.9
None	19	32.2	6,959	32.4
<b>Seed Treatment Total</b>			<b>15,972</b>	<b>74.2</b>
<b>North Dakota</b>				
Lorsban	12	19.0	6,245	22.6
Cruiser	16	25.4	5,152	18.6
Enhance AW	1	1.6	800	2.9
Gaucho	2	3.2	300	1.1
Unknown	1	1.6	142	0.5
None	32	50.8	13,824	50
<b>Seed Treatment Total</b>			<b>12,639</b>	<b>45.7</b>
<b>Northharvest</b>				
Lorsban	31	25.4	14,812	30.1
Cruiser	36	29.5	12,070	24.5
Enhance AW	1	0.8	800	1.6
Gaucho	4	3.3	487	1.0
Unknown	2	1.6	442	0.9
None	51	41.8	20,783	42.3
<b>Seed Treatment Total</b>			<b>28,611</b>	<b>58.2</b>

<sup>a</sup>Respondents' acres only.

<sup>b</sup>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. Northharvest foliar insecticide use in dry bean in 2011.**



**Figure 23. Northharvest insecticide seed treatment use in dry bean in 2011.**

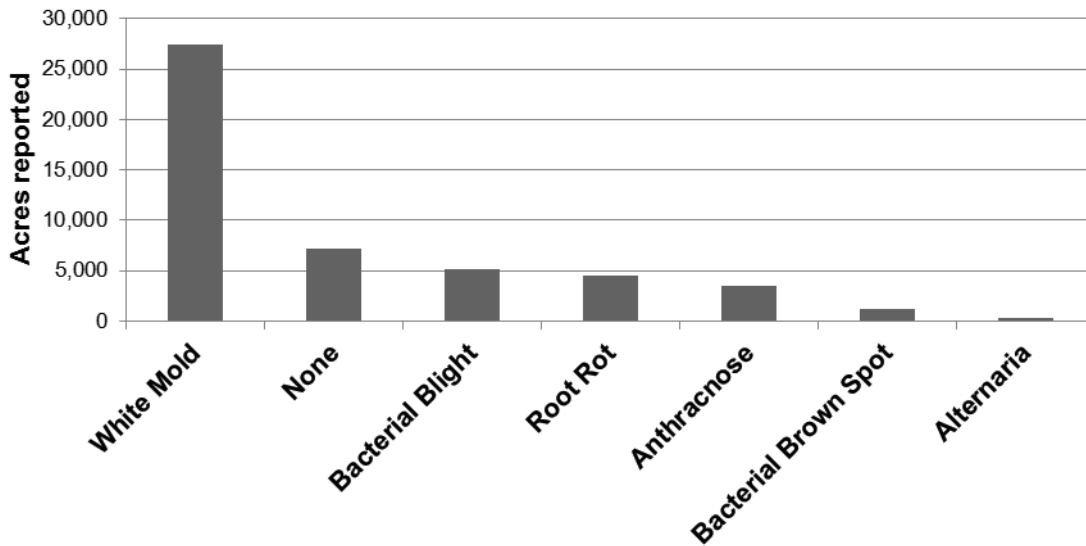
# Plant Diseases and Fungicide Use

**Table 25. Worst disease problem in dry bean in 2011.**

Disease <sup>a</sup>	Respondents (no.)	Respondents (%)	Acres reported (no.) <sup>b</sup>	Acres reported (%) <sup>b</sup>
<b>Minnesota</b>				
White Mold	29	49.2	10,763	50.1
Bacterial Blight	7	11.9	3,897	18.1
None	9	15.3	2,837	13.2
Root Rot	10	16.9	2,625	12.2
Anthracnose	2	3.4	940	4.4
Bacterial Brown Spot	2	3.4	440	2.0
<b>Total</b>	<b>59</b>	<b>100</b>	<b>21,502</b>	<b>100</b>
<b>North Dakota</b>				
White Mold	37	58.7	16,721	60.4
None	14	22.2	4,316	15.6
Anthracnose	3	4.8	2,520	9.1
Root Rot	6	9.5	1,926	7.0
Bacterial Blight	1	1.6	1,200	4.3
Bacterial Brown Spot	1	1.6	730	2.6
Alternaria	1	1.6	250	0.9
<b>Total</b>	<b>63</b>	<b>100</b>	<b>27,663</b>	<b>100</b>
<b>Northharvest</b>				
White Mold	66	54.1	27,484	55.9
None	23	18.9	7,153	14.5
Bacterial Blight	8	6.6	5,097	10.4
Root Rot	16	13.1	4,551	9.3
Anthracnose	5	4.1	3,460	7.0
Bacterial Brown Spot	3	2.5	1,170	2.4
Alternaria	1	0.8	250	0.5
<b>Total</b>	<b>122</b>	<b>100</b>	<b>49,165</b>	<b>100</b>

<sup>a</sup>Ranked as No. 1 disease problem by respondents.

<sup>b</sup>Respondents' acres only.



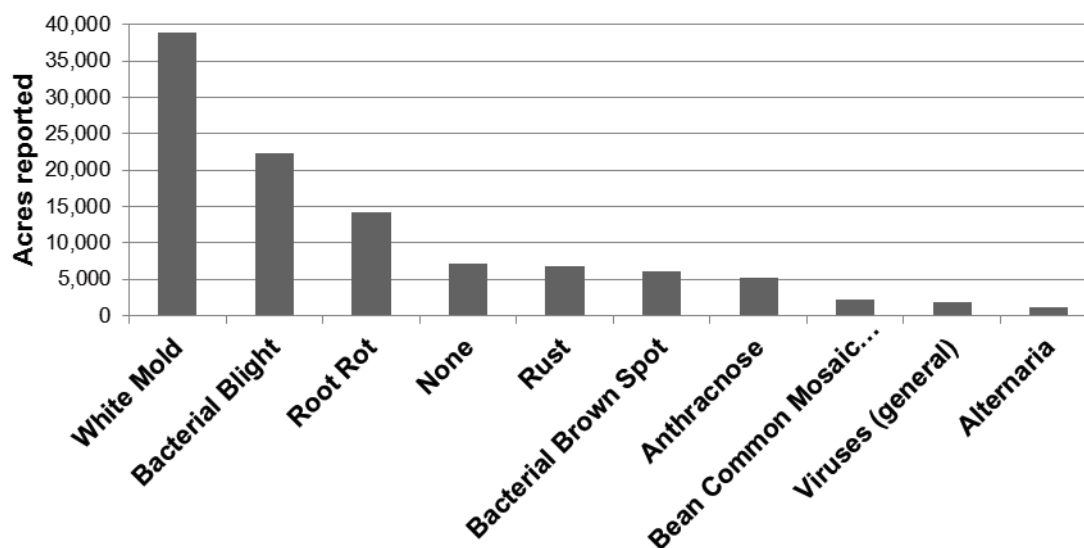
**Figure 24. Northharvest worst disease problem in dry bean in 2011.**

**Table 26. Diseases ranked as one of the three worst in dry bean in 2011.**

Disease <sup>a</sup>	Respondents (no.)	Respondents (%)	Acres reported (no.) <sup>b</sup>	Acres reported (%) <sup>b</sup>
<b>Minnesota</b>				
White Mold	43	72.9	15,820	73.6
Root Rot	27	45.8	11,059	51.4
Bacterial Blight	23	39.0	10,712	49.8
Bacterial Brown Spot	10	16.9	2,885	13.4
None	9	15.3	2,837	13.2
Rust	8	13.6	2,632	12.2
Viruses (general)	4	6.8	1,778	8.3
Anthracoese	4	6.8	1,640	7.6
Bean Common Mosaic Virus	2	3.4	353	1.6
<b>North Dakota</b>				
White Mold	47	74.6	23,056	83.3
Bacterial Blight	22	34.9	11,582	41.9
None	14	22.2	4,316	15.6
Rust	12	19.0	4,223	15.3
Anthracoese	5	7.9	3,570	12.9
Bacterial Brown Spot	7	11.1	3,275	11.8
Root Rot	8	12.7	3,180	11.5
Bean Common Mosaic Virus	2	3.2	1,820	6.6
Alternaria	2	3.2	1,170	4.2
<b>Northarvest</b>				
White Mold	90	73.8	38,876	79.1
Bacterial Blight	45	36.9	22,294	45.3
Root Rot	35	28.7	14,239	29.0
None	23	18.9	7,153	14.5
Rust	20	16.4	6,855	13.9
Bacterial Brown Spot	17	13.9	6,160	12.5
Anthracoese	9	7.4	5,210	10.6
Bean Common Mosaic Virus	4	3.3	2,173	4.4
Viruses (general)	4	3.3	1,778	3.6
Alternaria	2	1.6	1,170	2.4

<sup>a</sup>Ranked as No. 1, 2 or 3 disease problem by respondents.

<sup>b</sup>Respondents' acres only.



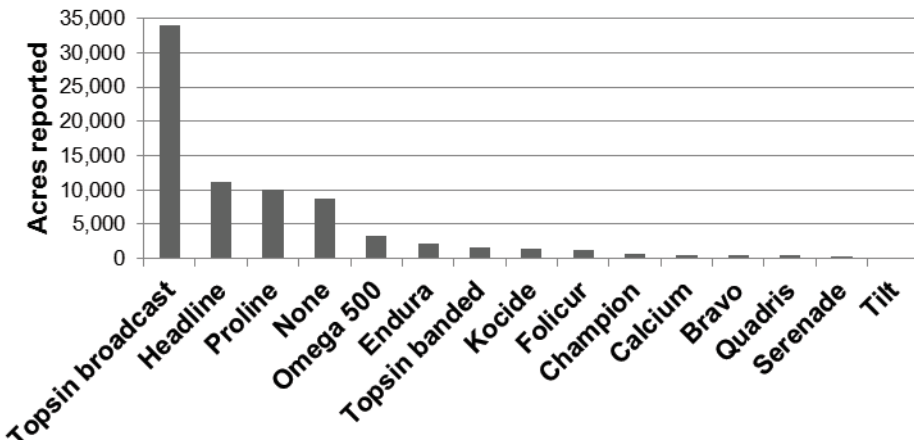
**Figure 25. Northarvest diseases ranked as one of the three worst in dry bean in 2011.**

**Table 27. Foliar and banded fungicide use in dry bean in 2011.**

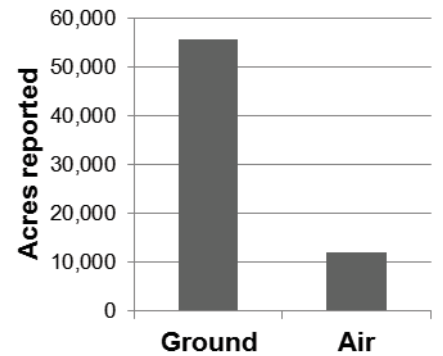
Fungicide	Resp. (no.)	Resp. (%) <sup>b</sup>	Total acres treated (no.) <sup>a</sup>	Total acres treated (%) <sup>a,b</sup>	Acres treated by ground (no.) <sup>a</sup>	Acres treated by ground (%) <sup>a,b</sup>	Acres treated by air (no.) <sup>a</sup>	Acres treated by air (%) <sup>a,b</sup>
<b>Minnesota</b>								
Topsin broadcast	29	49.2	16,965	78.9	14,065	65.4	2,900	13.5
Headline	10	16.9	8,643	40.2	7,467	34.7	1,176	5.5
Proline	19	32.2	7,251	33.7	6,770	31.5	481	2.2
Kocide	3	5.1	1,362	6.3	877	4.1	485	2.3
Folicur	1	1.7	1,040	4.8	1,040	4.8	0	0
Topsin banded	1	1.7	800	3.7	800	3.7	0	0
Champion	3	5.1	746	3.5	213	1.0	533	2.5
Endura	2	3.4	627	2.9	160	0.7	467	2.2
Calcium	1	1.7	505	2.3	505	2.3	0	0
Serenade	2	3.4	313	1.5	313	1.5	0	0
Omega 500	2	3.4	215	1.0	215	1.0	0	0
Tilt	1	1.7	200	0.9	200	0.9	0	0
None	8	13.6	2,426	11.3	0	0	0	0
<b>Fungicide Total</b>			<b>39,477</b>		<b>32,625</b>		<b>6,402</b>	
<b>North Dakota</b>								
Topsin broadcast	24	38.1	17,033	61.6	13,351	48.3	3,682	13.3
Omega 500	6	9.5	3,166	11.4	3,016	10.9	150	0.5
Proline	9	14.3	2,848	10.3	2,163	7.8	685	2.5
Headline	8	12.7	2,577	9.3	1,277	4.6	1,300	4.7
Endura	2	3.2	1,460	5.3	1,460	5.3	0	0
Topsin banded	2	3.2	820	3.0	820	3.0	0	0
Bravo	1	1.6	400	1.4	400	1.4	0	0
Quadris	1	1.6	400	1.4	400	1.4	0	0
Folicur	1	1.6	250	0.9	125	0.5	125	0.5
None	21	33.3	6,279	22.7	0	0	0	0
<b>Fungicide Total</b>			<b>56,617</b>		<b>23,012</b>		<b>5,942</b>	
<b>Northarvest</b>								
Topsin broadcast	53	43.4	33,998	69.2	27,416	55.8	6,582	13.4
Headline	18	14.8	11,220	22.8	8,744	17.8	2,476	5.0
Proline	28	23.0	10,099	20.5	8,933	18.2	1,166	2.4
Omega 500	8	6.6	3,381	6.9	3,231	6.6	150	0.3
Endura	4	3.3	2,087	4.2	1,620	3.3	467	0.9
Topsin banded	3	2.5	1,620	3.3	1,620	3.3	0	0
Kocide	3	2.5	1,362	2.8	877	1.8	485	1.0
Folicur	2	1.6	1,290	2.6	1,165	2.4	125	0.3
Champion	3	2.5	746	1.5	213	0.4	533	1.1
Calcium	1	0.8	505	1.0	505	1.0	0	0
Bravo	1	0.8	400	0.8	400	0.8	0	0
Quadris	1	0.8	400	0.8	400	0.8	0	0
Serenade	2	1.6	313	0.6	313	0.6	0	0
Tilt	1	0.8	200	0.4	200	0.4	0	0
None	29	23.8	8,705	17.7	0	0	0	0
<b>Fungicide Total</b>			<b>67,621</b>		<b>55,637</b>		<b>11,984</b>	

<sup>a</sup>Respondents' acres only. Includes acreage treated more than once with the same product.

<sup>b</sup>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 bean in 2011.**



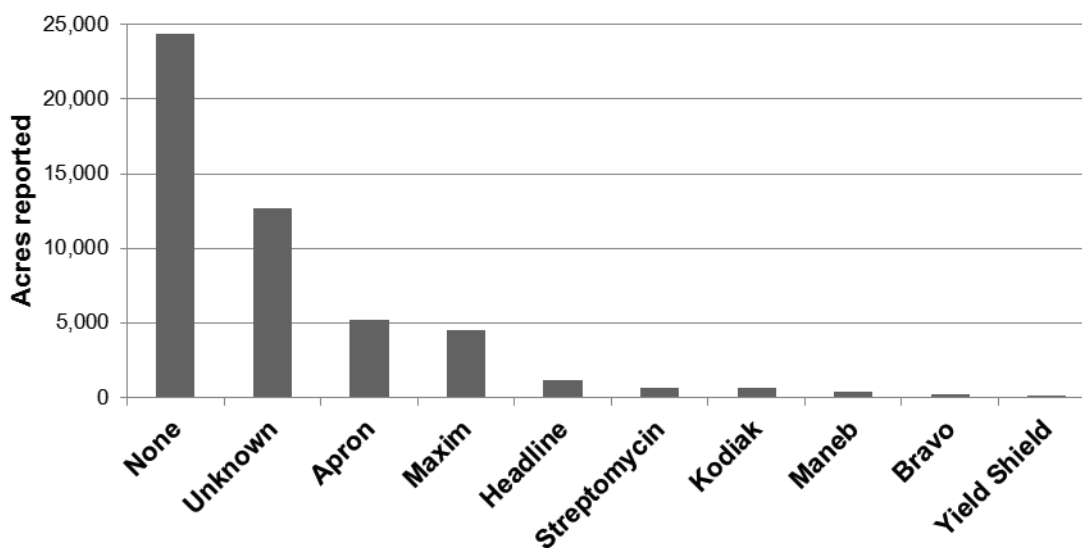
**Figure 27. Northarvest fungicide application method in dry bean in 2011.**

**Table 28. Fungicide seed treatment use in dry bean in 2011.**

Seed treatment	Respondents (no.)	Respondents (%) <sup>b</sup>	Total acres treated (no.) <sup>a</sup>	Total acres treated (%) <sup>a,b</sup>
<b>Minnesota</b>				
Apron	5	8.5	2,137	9.9
Maxim	5	8.5	2,137	9.9
Headline	2	3.4	1,115	5.2
Kodiak	1	1.7	610	2.8
Bravo	1	1.7	235	1.1
Yield Shield	1	1.7	125	0.6
Not listed	11	18.6	5,150	24.0
None	32	54.2	10,163	47.3
<b>Seed Treatment Total</b>			<b>11,509</b>	<b>53.5</b>
<b>North Dakota</b>				
Apron	7	11.1	3,048	11.0
Maxim	5	7.9	2,405	8.7
Streptomycin	1	1.6	614	2.2
Maneb	1	1.6	400	1.4
Not listed	12	19.0	7,561	27.3
None	36	57.1	14,211	51.4
<b>Seed Treatment Total</b>			<b>14,028</b>	<b>50.7</b>
<b>Northarvest</b>				
Apron	12	9.8	5,185	10.5
Maxim	10	8.2	4,542	9.2
Headline	2	1.6	1,115	2.3
Streptomycin	1	0.8	614	1.2
Kodiak	1	0.8	610	1.2
Maneb	1	0.8	400	0.8
Bravo	1	0.8	235	0.5
Yield Shield	1	0.8	125	0.3
Not listed	23	18.9	12,711	25.9
None	68	55.7	24,374	49.6
<b>Seed Treatment Total</b>			<b>25,537</b>	<b>51.9</b>

<sup>a</sup>Respondents' acres only.

<sup>b</sup>Percentages do not total 100 percent because some respondents treated the same acreage with more than one product.



**Figure 28. Northharvest fungicide seed treatment use in dry bean in 2011.**

# Weeds and Herbicide Use

**Table 29. Worst weed problem in dry bean in 2011.**

Weed <sup>a</sup>	Respon- dents (no.)	Respon- dents (%)	Acres reported (no.) <sup>b</sup>	Acres reported (%) <sup>b</sup>
<b>Minnesota</b>				
Lambsquarters	20	33.9	7,785	36.2
Nightshade	8	13.6	3,678	17.1
Kochia	5	8.5	2,239	10.4
Redroot Pigweed	4	6.8	2,051	9.5
Biennial Wormwood	5	8.5	1,905	8.9
Ragweed	6	10.2	1,062	4.9
Waterhemp	3	5.1	943	4.4
Wild Buckwheat	1	1.7	511	2.4
Crabgrass	1	1.7	290	1.3
Canada Thistle	1	1.7	280	1.3
Velvetleaf	1	1.7	160	0.7
Wild Oat	1	1.7	160	0.7
Wild Sunflower	1	1.7	62	0.3
Foxtail	1	1.7	61	0.3
None	1	1.7	315	1.5
<b>Total</b>	<b>59</b>	<b>100</b>	<b>21,502</b>	<b>100</b>
<b>North Dakota</b>				
Kochia	13	20.6	8,074	29.2
Nightshade	9	14.3	4,656	16.8
Lambsquarters	6	9.5	2,875	10.4
Redroot Pigweed	7	11.1	2,412	8.7
Ragweed	5	7.9	2,403	8.7
Biennial Wormwood	10	15.9	2,390	8.6
Canada Thistle	5	7.9	1,080	3.9
Cocklebur	1	1.6	800	2.9
Volunteer Grain	1	1.6	730	2.6
Wild Mustard	1	1.6	454	1.6
Field Bindweed	1	1.6	450	1.6
Wild Sunflower	1	1.6	275	1.0
Wild Buckwheat	1	1.6	143	0.5
Foxtail	1	1.6	61	0.2
None	1	1.6	860	3.1
<b>Total</b>	<b>63</b>	<b>100</b>	<b>27,663</b>	<b>100</b>
<b>Northharvest</b>				
Lambsquarters	26	21.3	10,660	21.7
Kochia	18	14.8	10,313	21.0
Nightshade	17	13.9	8,334	17.0
Redroot Pigweed	11	9.0	4,463	9.1
Biennial Wormwood	15	12.3	4,295	8.7
Ragweed	11	9.0	3,465	7.0
Canada Thistle	6	4.9	1,360	2.8
Waterhemp	3	2.5	943	1.9
Cocklebur	1	0.8	800	1.6
Volunteer Grain	1	0.8	730	1.5
Wild Buckwheat	2	1.6	654	1.3
Wild Mustard	1	0.8	454	0.9
Field Bindweed	1	0.8	450	0.9
Wild Sunflower	2	1.6	337	0.7
Crabgrass	1	0.8	290	0.6
Velvetleaf	1	0.8	160	0.3
Wild Oat	1	0.8	160	0.3
Foxtail	2	1.6	122	0.2
None	2	1.6	1,175	2.4
<b>Total</b>	<b>122</b>	<b>100</b>	<b>49,165</b>	<b>100</b>

<sup>a</sup>Ranked as No. 1 weed problem by respondents.

<sup>b</sup>Respondents' acres only.

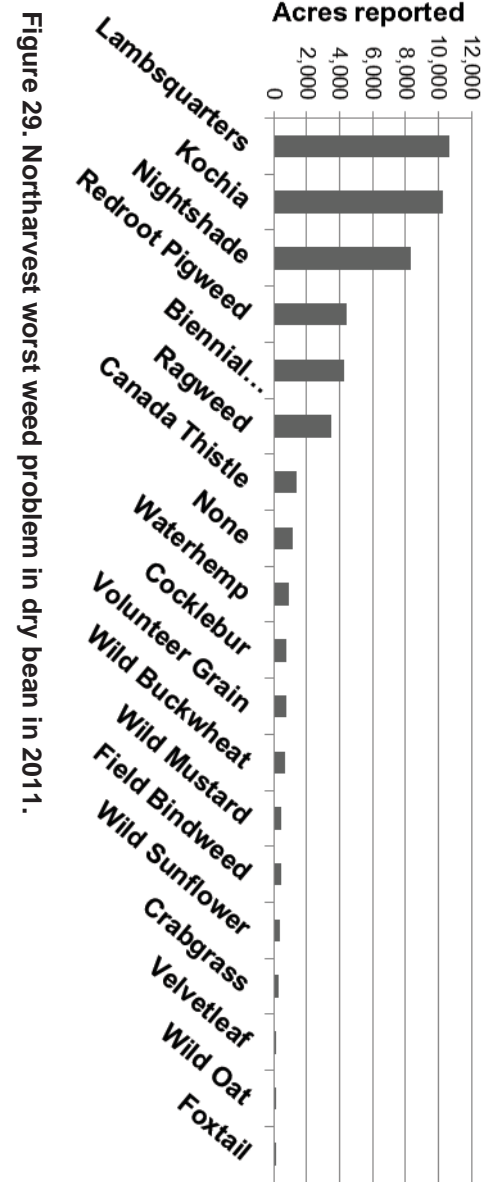


Figure 29. Northharvest worst weed problem in dry bean in 2011.

**Table 30. Weeds ranked as one of the three worst in dry bean in 2011.**

Weed <sup>a</sup>	Respon- dents (no.)	Respon- dents (%)	Acres reported (no.) <sup>b</sup>	Acres reported (%) <sup>b</sup>
<b>Minnesota</b>				
Lambsquarters	40	67.8	14,790	68.8
Redroot Pigweed	18	30.5	8,295	38.6
Ragweed	24	40.7	7,440	34.6
Nightshade	22	37.3	7,300	34.0
Biennial Wormwood	13	22.0	5,110	23.8
Kochia	13	22.0	4,903	22.8
Cocklebur	6	10.2	3,346	15.6
Waterhemp	9	15.3	2,392	11.1
Canada Thistle	5	8.5	1,783	8.3
Foxtail	6	10.2	1,472	6.8
Volunteer Grain	2	3.4	724	3.4
Wild Oat	2	3.4	665	3.1
Wild Buckwheat	1	1.7	511	2.4
Crabgrass	1	1.7	290	1.3
Velvetleaf	1	1.7	160	0.7
Wild Sunflower	1	1.7	62	0.3
None	1	1.7	315	1.5
<b>North Dakota</b>				
Nightshade	28	44.4	12,747	46.1
Kochia	26	41.3	12,622	45.6
Biennial Wormwood	20	31.7	9,974	36.1
Lambsquarters	21	33.3	9,122	33.0
Volunteer Grain	16	25.4	8,483	30.7
Ragweed	18	28.6	7,071	25.6
Redroot Pigweed	18	28.6	6,874	24.8
Canada Thistle	17	27.0	6,733	24.3
Cocklebur	6	9.5	1,918	6.9
Wild Oat	2	3.2	1,220	4.4
Foxtail	4	6.3	581	2.1
Curly Dock	1	1.6	480	1.7
Wild Mustard	1	1.6	454	1.6
Field Bindweed	1	1.6	450	1.6
Wild Sunflower	1	1.6	275	1.0
Wild Buckwheat	1	1.6	143	0.5
None	1	1.6	860	3.1
<b>Northharvest</b>				
Lambsquarters	61	50	23,912	48.6
Nightshade	50	41.0	20,047	40.8
Kochia	39	32.0	17,525	35.6
Redroot Pigweed	36	29.5	15,169	30.9
Biennial Wormwood	33	27.0	15,084	30.7
Ragweed	42	34.4	14,511	29.5
Volunteer Grain	18	14.8	9,207	18.7
Canada Thistle	22	18.0	8,516	17.3
Cocklebur	12	9.8	5,264	10.7
Waterhemp	9	7.4	2,392	4.9
Foxtail	10	8.2	2,053	4.2
Wild Oat	4	3.3	1,885	3.8
Wild Buckwheat	2	1.6	654	1.3
Curly Dock	1	0.8	480	1.0
Wild Mustard	1	0.8	454	0.9
Field Bindweed	1	0.8	450	0.9
Wild Sunflower	2	1.6	337	0.7
Crabgrass	1	0.8	290	0.6
Velvetleaf	1	0.8	160	0.3
None	2	1.6	1,175	2.4

<sup>a</sup>Ranked as No. 1, 2 or 3 weed by respondents.

<sup>b</sup>Respondents' acres only.

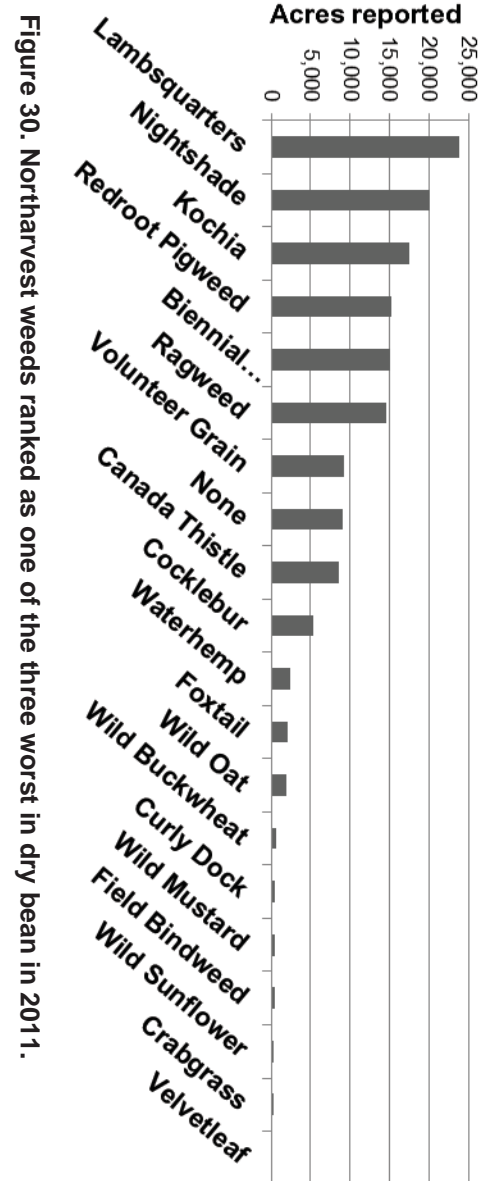
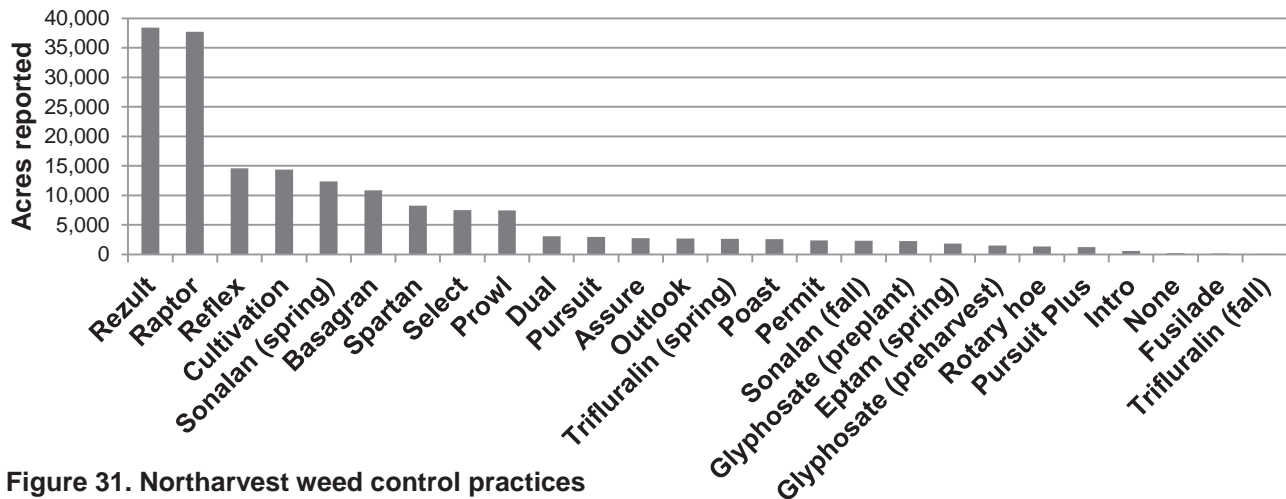


Figure 30. Northharvest weeds ranked as one of the three worst in dry bean in 2011.

**Table 31. Weed control practices used in dry bean in 2011.**

Herbicide or other practice	Acres reported (no.) <sup>a</sup>	Acres reported (%) <sup>b</sup>	Herbicide or other practice	Acres reported (no.) <sup>a</sup>	Acres reported (%) <sup>b</sup>
<b>Minnesota</b>			<b>Northharvest</b>		
Raptor	18,501	86.0	Rezult	38,391	78.1
Rezult	13,878	64.5	Raptor	37,720	76.7
Reflex	7,833	36.4	Reflex	14,586	29.3
Basagran	7,609	35.4	Cultivation	14,378	29.2
Cultivation	6,851	31.9	Sonalan (spring)	12,391	25.2
Sonalan (spring)	4,641	21.6	Basagran	10,831	22.0
Prowl	3,229	15.0	Spartan	8,279	16.8
Dual	3,095	14.4	Select	7,479	15.2
Poast	2,490	11.6	Prowl	7,455	15.2
Select	2,110	9.8	Dual	3,095	6.3
Permit	2,047	9.5	Pursuit	2,980	6.1
Outlook	2,044	9.5	Assure	2,748	5.6
Trifluralin (spring)	1,879	8.7	Outlook	2,694	5.5
Eptam (spring)	1,818	8.5	Trifluralin (spring)	2,659	5.4
Sonalan (fall)	1,561	7.3	Poast	2,610	5.3
Pursuit	1,468	6.8	Permit	2,345	4.8
Assure	1,430	6.7	Sonalan (fall)	2,301	4.7
Pursuit Plus	989	4.6	Glyphosate (preplant)	2,252	4.6
Glyphosate (preharvest)	779	3.6	Eptam (spring)	1,818	3.7
Intro	606	2.8	Glyphosate (preharvest)	1,479	3.0
Spartan	490	2.3	Rotary hoe	1,327	2.7
Rotary hoe	467	2.2	Pursuit Plus	1,239	2.5
Fusilade	155	0.7	Intro	606	1.2
None	83	0.4	Fusilade	155	0.3
<b>Herbicide Total<sup>c</sup></b>	<b>78,652</b>		Trifluralin (fall)	104	0.2
<b>North Dakota</b>			None	225	0.5
Rezult	24,513	88.6	<b>Herbicide Total<sup>c</sup></b>	<b>166,217</b>	
Raptor	19,219	69.5	<sup>a</sup> Respondents' acres only. Includes acreage treated more than once with the same product.		
Spartan	7,789	28.2	<sup>b</sup> 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.		
Sonalan (spring)	7,750	28.0	<sup>c</sup> Herbicide total does not include cultivation, rotary hoe or nontreated acres.		
Cultivation	7,527	27.2			
Reflex	6,753	23.8			
Select	5,369	19.4			
Prowl	4,226	15.3			
Basagran	3,222	11.6			
Glyphosate (preplant)	2,252	8.1			
Pursuit	1,512	5.5			
Assure	1,318	4.8			
Rotary hoe	860	3.1			
Trifluralin (spring)	780	2.8			
Sonalan (fall)	740	2.7			
Glyphosate (preharvest)	700	2.5			
Outlook	650	2.3			
Permit	298	1.1			
Pursuit Plus	250	0.9			
Poast	120	0.4			
Trifluralin (fall)	104	0.4			
None	142	0.5			
<b>Herbicide Total<sup>c</sup></b>	<b>87,565</b>				



**Figure 31. Northharvest weed control practices used in dry bean in 2011.**

**Table 32. Weed control practices used by dry bean market class in 2011.**

Herbicide or other practice	Black	Kidney	Navy	Pink	Pinto	Red
	% Acres Treated <sup>a,b</sup>					
<b>Minnesota</b>						
Assure	0	0	19.3	0	0	0
Basagran	60.6	21.9	53.9	46.8	13.5	0
Cultivation	27.0	18.5	38.4	27.9	68.5	100
Dual	13.5	28.3	1.3	8.5	0	0
Eptam (spring)	0	4.8	18.3	0	0	0
Fusilade	0	0	2.1	0	0	0
Glyphosate (preharvest)	0	8.1	0	0	0	0
Intro	0	6.3	0	0	0	0
None	0	0	1.1	0	0	0
Outlook	0	16.8	4.1	16.8	0	0
Permit	21.2	11.2	6.2	11.0	5.9	0
Poast	25.9	3.9	21.3	0	7.7	0
Prowl	29.0	12.1	17.9	0	15.3	0
Pursuit	0	9.2	5.9	0	7.2	0
Pursuit Plus	11.9	7.8	0.8	0	0	0
Raptor	110.8	74.5	96.4	91.5	95.1	0
Reflex	35.0	35.7	39.6	8.5	30.5	100
Rezult	36.7	60.7	63.1	44.7	112.6	100
Rotary hoe	0	0	0	0	23.9	0
Select	13.5	0.7	17.5	11.0	23.9	0
Sonalan (fall)	0	0	19.1	0	7.7	0
Sonalan (spring)	21.2	5.9	38.4	0	46.4	0
Spartan	7.7	0	3.5	0	5.9	0
Trifluralin (spring)	16.6	1.8	15.4	44.3	0	0
<b>North Dakota</b>						
Assure	0	0	21.6	0	2.3	0
Basagran	3.1	0	20.8	102.4	9.3	0
Cultivation	9.5	0	37.0	203.2	25.4	0
Glyphosate (preharvest)	5.7	0	0	0	1.9	0
Glyphosate (preplant)	0	0	0	0	14.5	0
None	0	0	0	0	0.9	0
Outlook	0	0	0	0	4.2	0
Permit	0	0	5.3	0	0.4	0
Poast	1.7	0	0	0	0	0
Prowl	25.0	100	11.3	0	12.3	0
Pursuit	3.6	0	1.9	0	7.6	0
Pursuit Plus	0	0	5.6	0	0	0
Raptor	69.8	100	69.2	134.4	66.7	0
Reflex	19.7	100	52.3	0	19.2	0
Rezult	88.7	100	86.7	50.4	90.6	0
Rotary hoe	8.0	0	0	0	1.9	0
Select	18.8	0	25.9	0	18.7	0
Sonalan (fall)	6.4	0	2.9	0	1.0	0
Sonalan (spring)	16.2	0	41.7	50.4	28.7	0
Spartan	32.9	0	11.4	0	32.1	0
Trifluralin (fall)	0	0	0	0	0.7	0
Trifluralin (spring)	4.3	0	4.5	0	1.8	0
<b>Northharvest</b>						
Assure	0	0	20.2	0	2.1	0
Basagran	13.2	21.7	41.5	72.5	9.7	0
Cultivation	12.6	18.4	37.9	108.9	30.2	100
Dual	2.4	28.2	0.8	4.6	0	0
Eptam (spring)	0	4.7	11.5	0	0	0
Fusilade	0	0	1.3	0	0	0
Glyphosate (preharvest)	4.7	8.0	0	0	1.7	0
Glyphosate (preplant)	0	0	0	0	12.9	0
Intro	0	6.2	0	0	0	0
None	0	0	0.7	0	0.8	0
Outlook	0	16.6	2.6	9.0	3.7	0
Permit	3.7	11.1	5.9	5.9	1.0	0
Poast	6.0	3.9	13.3	0	0.9	0
Prowl	25.7	12.7	15.5	0	12.6	0
Pursuit	2.9	9.1	4.4	0	7.5	0
Pursuit Plus	2.1	7.7	2.6	0	0	0
Raptor	77.0	74.7	86.2	111.3	69.8	0
Reflex	22.4	36.1	44.4	4.6	20.5	100
Rezult	79.6	60.9	72.0	47.3	93.1	100
Rotary hoe	6.6	0	0	0	4.4	0
Select	17.8	0.7	20.7	5.9	19.3	0
Sonalan (fall)	5.3	0	13.0	0	1.8	0
Sonalan (spring)	17.1	5.9	39.7	23.3	30.6	0

Herbicide or other practice	Black	Kidney	Navy	Pink	Pinto	Red
			% Acres Treated <sup>a,b</sup>			
Spartan	28.5	0	6.5	0	29.1	0
Trifluralin (fall)	0	0	0	0	0.6	0
Trifluralin (spring)	6.5	1.8	11.3	23.8	1.6	0

<sup>a</sup>Respondents' acres only. Includes acreage treated more than once with the same product.

<sup>b</sup>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.

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# APPENDIX I.

Please circle or fill in the requested information on pest problems and pesticide used on your 2011 dry bean crop.

Total dry bean acres planted in 2011
Total irrigated acres
Total dry bean acres on tile-drained ground
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 904		
	3. GT 907		
	4. Maverick		
	5. Mariah		
	6. Medicine Hat		
	7. Santa Fe		
	8. LaPaz		
	9. Windbreaker		
	10. Lariat		
	11. Sonora		
	12. Stampede		
	13. ND-307		
	14. Other pinto (specify)		
Navy	21. HMS Medalist		
	22. Mayflower		
	23. Navigator		
	24. Norstar		
	25. Vista		
	26. Ensign		
	28. T9905		
	29. Avalanche		
	30. Other navy (specify)		
	Kidney	41. Montcalm (DRK)	
		42. Red Hawk	
43. CELRK			
44. Chinook 2000			
45. Foxfire			
46. Pink Panther			
47. Red Rover			
48. Closeau			
49. Other kidney (specify)			
Black	61. Zorro		
	62. Jaguar		
	63. T-39		
	64. Eclipse		
	65. Loreto		
	66. Bandit		
	67. Condor		
	68. Shania		
	69. Other black (specify)		
	Pink	81. Sedona	
82. Floyd			
83. Viva			
84. Other pink (specify)			
Other	91. (specify class and variety)		

Crop Rotation (field with dry beans in 2011) (write in crops grown in previous years)		
	Field 1 - dry beans '11	Field 2 - dry beans '11
2010		
2009		
2008		
2007		

Agronomy	
What is your row spacing in inches for prostrated varieties?	
What is your row spacing in inches for upright (type II) varieties?	
What is your plant population (plants per acre)?	

What TILLAGE practice(s) do you use? (estimate acreage for each type)	
Tillage	Acreage
Conventional tillage	
Strip-tillage	
No-till	

Biggest Production Problem in Dry Beans (circle one and complete table)		
	Acres Affected	Bean Class
1. Applied herbicide injury*		
2. *List herbicide in No. 1		
3. Herbicide drift injury		
4. Delayed planting		
5. Emergence/stand		
6. Harvest		
7. Disease		
8. Insects		
9. Micronutrient deficiency		
10. Weeds		
11. Excess water		
12. Other (specify)		
13. None		





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

Fungicides Used on Dry Beans			
Fungicide Used (write in name or number)	No. Acres Treated	No. of Sprays	Application Method (circle one)
			air ground
			air ground
			air ground
			air ground
			air ground
			air ground
			air ground
<b>Dry Bean Fungicides</b>	1. Bravo/Echo/generics 2. Champion/Champ 3. Endura 4. Folcur/generics 5. Headline 6. Intercept 7. Kocide 8. Omega 9. Proline 10. Maneb	11. Rovral 12. Serenade 13. Switch 14. Tliolux 15. Tilt 16. Topsin/generics (broadcast) 17. Topsin/generics (banded) 18. Quadris/Amistar 19. Quadris Opti 20. Other 21. Any tank mixes? List combination	

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

General Fertilizer Program for Dry Beans - pounds per acre applied				
Nitrogen	Phosphate	Potash	Zinc	Other
Inoculate with rhizobium bacteria?	Yes	No		
Soil test prior to fertilization?	Yes	No		

Direct Harvest	A type II bean is an upright bean with a short vine that is commonly used for direct harvest. If you used a upright (type II) bean, please answer the two questions below.
	1) What was your row spacing in inches that you used for upright (type II) beans? _____
	2) What was your seeding rate for upright (type II) beans in live seeds per acre? _____
	On your farm, what percentage of your total dry bean area is being harvested using direct combining? (circle one) 0%      1 - 25%      26 - 50%      51 - 75%      76 - 100%
	What is your estimated yield loss in your direct harvested field (percentage)? _____ %
What is your estimated yield loss in your conventionally harvested field (percentage)? _____ %	

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Cover photos by H.J. Kandel and J.M. Osorno

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