

**Agricultural Biotechnology and the
Midwestern Agricultural Producer**

Michael E. Lawson¹ Ronald G. Stover² Donna J. Hess³

Gary A. Gorham⁴ George A. Youngs⁵

Sponsored By:

The Consortium to Address the Social, Ethical, and Economic Aspects of Agricultural Biotechnology. Funded by: The Initiative for Future Agriculture and Food Systems, Cooperative State Research, Education, and Extension Service, United States Department of Agriculture under agreement No. 00-52100-9617.

May 2003

¹ South Dakota State University, Department of Rural Sociology, Brookings, SD. E-mail: Michael_Lawson@sdstate.edu.

² South Dakota State University, Department of Rural Sociology, Brookings, SD. E-mail: Ronald_Stover@sdstate.edu.

³ South Dakota State University, Department of Rural Sociology, Brookings, SD.

⁴ North Dakota State University, Department of Sociology-ANthropology, Fargo, ND.

⁵ North Dakota State University, Department of Sociology-Anthropology, Fargo, ND.

Agricultural Biotechnology and the Midwestern Producer

The genetic modification of agricultural plants and animals—agricultural biotechnology—recently sparked substantial debate. Opinions about agricultural biotechnology range from those suggesting genetically modified organisms (GMOs) should be banned altogether to those strongly supportive of the development of GMOs. While typically thought to be principally a biological and agricultural issue, the debate includes important social dimensions. In contrast to the biological and agricultural sciences' focus on gene discovery, manipulation, and transfer of agricultural biotechnology, the focus of the social sciences is on the human dimensions. These dimensions include social issues such as the attitudes and perceived concerns about the use of GMOs, economic concerns such as the ease or difficulty of marketing GMOs, and ethical issues such as the moral acceptance of genetic manipulation of plants and animals. To understand fully the societal implications of agricultural biotechnology, it is important to investigate these human dimensions.

Nine Midwest land grant universities and colleges (including four tribal colleges) formed a consortium to investigate the social, economic, and ethical aspects regarding the application of biotechnology to food production and to the adoption or rejection of GMOs. This consortium is sponsored by the United States Department of Agriculture Initiative for Future Agricultural and Food Systems (USDA-IFAFS). As part of the research activities of the consortium, a questionnaire was mailed to a randomly selected sample of agricultural producers, as well as organic farmers, in five Midwestern states—Iowa, Minnesota, North Dakota, South Dakota, and Wisconsin. This report summarizes the responses to this questionnaire.

SECTION 1: RESPONDENT BACKGROUND INFORMATION

Table 1. State where Respondent Resides

<u>State</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Iowa	168	17.9
Minnesota	163	17.4
North Dakota	157	16.8
Wisconsin	154	16.4
South Dakota	195	20.8
<u>Organic Farmer</u>	100	10.7
Total	937	100.0

Table 2. Respondent Age

<u>Age</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
18-28	9	1.1
29-38	48	5.7
39-48	176	20.9
49-58	243	28.9
59-68	196	23.3
69-78	120	14.3
79-88	44	5.2
89 or older	5	.6
Total	841	100.0
<u>Missing</u>	96	
Total	937	

Table 3. What is your gender?

<u>Gender</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Male	783	92.7
Female	62	7.3
Total	845	100.0
<u>Missing</u>	92	
Total	937	

Table 4. What race do you consider yourself to be?

<u>Race</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
American Indian or Alaska Native	3	.4
Asian	1	.1
White	829	98.8
Write-in Responses		
Some other race	1	.1
White/some other race	2	.2
White/American Indian or Alaska Native	1	.1
Some other race/Human	1	.1
American	1	.1
Total	839	100.0
<u>Missing</u>	98	
Total	937	

Table 5. What is your current marital status?

<u>Status</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Married	716	84.5
Living as Married	8	.9
Widowed	24	2.8
Divorced	28	3.3
Separated	2	.2
Single	69	8.1
Total	847	100.00
<u>Missing</u>	90	
Total	937	

Table 6. Please indicate the highest level of education you have completed.

<u>Education</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Graduate Degree	55	6.5
Some Graduate Work	37	4.4
College Degree	206	24.4
Some College or Technical School Training but no Degree	232	27.5
High School Graduate or GED Diploma	267	31.6
11th Grade or Less	48	5.7
Total	845	100.0
<u>Missing</u>	92	
Total	937	

Table 7. What is the population size of the community in which you were reared?

<u>Population</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Had less than 2500 Residents	614	72.9
Had 2500 to 4999 Residents	86	10.2
Had 5000 to 14,999 Residents	86	10.2
Had 15,000 to 24,999 Residents	22	2.6
Had 25,000 to 49,999 Residents	20	2.4
Had 50,000 to 99,999 Residents	5	.6
Had 100,000 or more Residents	9	1.1
Total	842	100.0
<u>Missing</u>	95	
Total	937	

Table 8. Counting yourself: How many persons live at your residence?

<u>Persons</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
1	76	9.0
2	410	48.8
3	122	14.5
4	116	13.8
5	72	8.6
6	34	4.0
7	7	.8
8	2	.2
9	2	.2
Total	841	100.0
<u>Missing</u>	96	
Total	937	

SECTION 2: ABOUT RESPONDENT FARMING AND/OR RANCHING OPERATIONS

Table 9. For how long have you been farming and/or ranching?

<u>Time</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
I am not in Farming or Ranching	40	4.7
0-5 Years	13	1.5
6-10 Years	24	2.8
11-20 Years	101	12.0
21-25 Years	110	13.0
More than 25 Years	557	65.9
Total	845	100.0
<u>Missing</u>	92	
Total	937	

Table 10. In what state is your operation located?⁶

<u>State</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Iowa	153	18.3
Minnesota	160	19.1
North Dakota	164	19.6
Wisconsin	128	15.3
South Dakota	191	22.8
South Dakota/North Dakota	2	.2
N/A	39	4.7
Total	837	100.0
<u>Missing</u>	100	
Total	937	

⁶ Frequencies and percentages for “County in which farming operation are located” are not provided here due to the large number of answers to this open-ended question.

Table 11. Acres owned and operated in 2001

<u>Acres</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
0-100	162	19.9
101-200	129	15.8
201-300	86	10.6
301-400	82	10.1
401-500	49	6.0
501-1000	153	18.8
1001-2000	88	10.8
2001-3000	14	1.7
>3000	12	1.5
N/A	39	4.8
Total	814	100.0
<u>Missing</u>	123	
Total	937	

Table 12. Acres rented in and operated in 2001

<u>Acres</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
0-100	341	41.9
101-200	73	9.0
201-300	52	6.4
301-400	42	5.2
401-500	41	5.0
501-1000	100	12.3
1001-2000	83	10.2
2001-3000	27	3.3
>3000	16	2.0
N/A	39	4.8
Total	814	100.0
<u>Missing</u>	123	
Total	937	

Table 13. Total acres of canola planted in 2001

<u>Acres</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
0-100	725	90.7
101-200	7	.9
201-300	6	.8
301-400	10	1.3
401-500	3	.4
501-1000	8	1.0
1001-2000	1	.1
N/A	39	4.9
Total	799	100.0
<u>Missing</u>	138	
Total	937	

Table 14. Total acres of corn planted in 2001

<u>Acres</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
0-100	420	52.6
101-200	123	15.4
201-300	69	8.6
301-400	42	5.3
401-500	35	4.4
501-1000	55	6.9
1001-2000	14	1.8
2001-3000	1	.1
N/A	39	4.9
Total	789	100.0
<u>Missing</u>	139	
Total	937	

Table 15. Total acres of potatoes planted in 2001

<u>Acres</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
0-100	754	94.4
101-200	1	.1
201-300	3	.4
501-1000	2	.3
N/A	39	4.9
Total	799	100.0
<u>Missing</u>	138	
Total	937	

Table 16. Total acres of soybeans planted in 2001

<u>Acres</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
0-100	419	52.5
101-200	102	12.8
201-300	72	9.0
301-400	45	5.6
401-500	37	4.6
501-1000	60	7.5
1001-2000	16	2.0
2001-3000	5	.6
>3000	3	.4
N/A	39	4.9
Total	798	100.0
<u>Missing</u>	139	
Total	937	

Table 17. Total acres of “other” planted in 2001

<u>Acres</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
0-100	574	71.9
101-200	43	5.4
201-300	32	4.0
301-400	19	2.4
401-500	8	1.0
501-1000	31	3.9
1001-2000	35	4.4
2001-3000	11	1.4
>3000	6	.8
N/A	39	4.9
Total	798	100.0
<u>Missing</u>	139	
Total	937	

Table 18. Total acres of GM canola planted in 2001

<u>Acres</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
0-100	736	91.0
101-200	9	1.1
201-300	9	1.1
301-400	5	.6
401-500	3	.4
501-1000	6	.7
1001-2000	1	.1
2001-3000	1	.1
N/A	39	4.8
Total	809	100.0
<u>Missing</u>	128	
Total	937	

Table 19. Total acres of GM soybeans planted in 2001

<u>Acres</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
0-100	531	65.7
101-200	86	10.6
201-300	48	5.9
301-400	28	3.5
401-500	27	3.3
501-1000	31	3.8
1001-2000	14	1.7
2001-3000	2	.2
>3000	2	.2
N/A	39	4.8
Total	808	100.0
<u>Missing</u>	129	
Total	937	

Table 20. Total acres of GM potatoes planted in 2001

<u>Acres</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
0-100	766	94.8
101-200	2	.2
501-1000	1	.1
N/A	39	4.8
Total	808	100.0
<u>Missing</u>	129	
Total	937	

Table 21. Total acres of GM corn planted in 2001

<u>Acres</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
0-100	612	75.7
101-200	74	9.2
201-300	34	4.2
301-400	15	1.9
401-500	17	2.1
501-1000	15	1.9
1001-2000	1	.1
2001-3000	1	.1
N/A	39	4.8
Total	808	100.0
<u>Missing</u>	129	
Total	937	

Table 22. Total acres of GM "other" planted in 2001

<u>Acres</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
0-100	750	92.7
101-200	9	1.1
201-300	6	.7
301-400	1	.1
401-500	1	.1
501-1000	3	.4
N/A	39	4.8
Total	809	100.0
<u>Missing</u>	128	
Total	937	

Table 23. Which of the following best describes your orientation to farming?

<u>Orientation</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Conventional	604	72.9
Organic	99	12.0
Sustainable	84	10.1
Conventional/Organic	2	.2
N/A	39	4.7
Total	828	100.0
<u>Missing</u>	109	
Total	937	

Table 24. Have you considered planting genetically engineered seed on your farm?

<u>Considered Planting</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Yes	597	71.8
No	196	23.6
N/A	39	4.7
Total	832	100.0
<u>Missing</u>	105	
Total	937	

Table 25. Have you ever planted genetically engineered seed?

<u>Ever Planted</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Yes	522	63.9
No	53	6.5
N/A	242	29.6
Total	817	100.0
<u>Missing</u>	120	
Total	937	

Table 26. For how many years have you been planting GMO crops?

<u>Years</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
0-2 Years	156	18.8
3-4 Years	230	27.7
5-6 Years	119	14.4
7 or more Years	32	3.9
N/A	292	35.2
Total	829	100.0
<u>Missing</u>	108	
Total	937	

Table 27. Will you plant genetically modified crops next year?

<u>Will Plant</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Yes	501	62.2
No	65	8.2
N/A	239	29.7
Total	806	100.0
<u>Missing</u>	131	
Total	937	

Table 28. Why did you plant genetically modified crops?⁷

<u>Why Plant</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Easier to manage/Rid persistent weeds	129	15.7
To get rid of Persistent Weeds	107	13.0
Other	296	36.0
N/A	291	35.4
Total	823	100.0
<u>Missing</u>	114	
Total	937	

⁷ Frequencies and percentages are not provided for the answers to the open-ended part of this question.

Table 29. Are you employed by an agricultural business?⁸

<u>Respondent Employed</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Yes	82	9.8
No	713	85.4
N/A	40	4.8
Total	835	100.0
<u>Missing</u>	102	
Total	937	

⁸ Frequencies and percentages for the types of agricultural businesses are not provided here due to the large number of answers to this open-ended question.

Table 30. Is your spouse/partner employed by an agricultural business?

<u>Spouse/Partner Employed</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Doesn't have Spouse or Partner	101	12.1
Yes	53	6.3
No	643	76.8
N/A	40	4.8
Total	837	100.0
<u>Missing</u>	100	
Total	937	

Table 31. Which of the following categories represents the total gross farm receipts for your farm business in 2001?

<u>Receipts</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Under \$20,000	80	10.4
\$20,000-\$49,999	132	17.1
\$50,000-\$99,999	119	15.4
\$100,000-\$149,999	105	13.6
\$150,000-199,999	82	10.6
\$200,000-\$249,999	58	7.5
\$250,000-\$499,999	92	11.9
\$500,000 or More	65	8.4
N/A	39	5.1
Total	772	100.0
<u>Missing</u>	165	
Total	937	

SECTION 3: THE PRACTICAL CHALLENGES OF THE USE OF GENETICALLY MODIFIED ORGANISMS

Table 32. If genetically modified crops had to be segregated from non-genetically modified crops at the farm level, I would not plant genetically modified crops.

<u>Would Not Plant</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	142	16.8
Agree	261	30.9
No Opinion	136	16.1
Disagree	266	31.5
Strongly Disagree	40	4.7
Total	845	100.0
<u>Missing</u>	92	
Total	937	

Table 33. The segregation of genetically modified crops from non-genetically modified crops is not practical.

<u>Not Practical</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	133	15.7
Agree	404	47.6
No Opinion	93	11.0
Disagree	160	18.9
Strongly Disagree	58	6.8
Total	848	100.0
<u>Missing</u>	89	
Total	937	

Table 34. The use of genetically modified organisms will help solve the problem of farm surpluses by finding new uses for crops and livestock.

<u>Solve Problem</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	32	3.8
Agree	242	28.6
No Opinion	228	27.0
Disagree	253	29.9
Strongly Disagree	91	10.8
Total	846	100.0
<u>Missing</u>	91	
Total	937	

Table 35. The use of genetically modified organisms will harm American farmers by increasing farm surpluses.

<u>Harm</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	83	9.8
Agree	199	23.6
No Opinion	144	17.0
Disagree	355	42.0
Strongly Disagree	64	7.6
Total	845	100.0
<u>Missing</u>	92	
Total	937	

Table 36. I am concerned whether or not U.S. consumers will accept genetically modified crops in the future.

<u>Concerned</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	286	33.7
Agree	423	49.9
No Opinion	58	6.8
Disagree	70	8.3
Strongly Disagree	11	1.3
Total	848	100.0
<u>Missing</u>	89	
Total	937	

Table 37. I am concerned whether or not foreign consumers will accept genetically modified crops in the future.

<u>Concerned</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	181	21.3
Agree	473	55.8
No Opinion	61	7.2
Disagree	119	14.0
Strongly Disagree	14	1.7
Total	848	100.0
<u>Missing</u>	89	
Total	937	

SECTION 4: ATTITUDES, VALUES, AND BELIEFS ABOUT GENETICALLY MODIFIED ORGANISMS

Table 38. Consumers are adequately informed about health risks associated with GM food products.

<u>Adequately Informed</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	23	2.7
Agree	226	26.5
No Opinion	119	14.0
Disagree	324	38.0
Strongly Disagree	160	18.8
Total	852	100.0
<u>Missing</u>	85	
Total	937	

Table 39. Consumers are adequately protected by the governmental approval process.

<u>Adequately Protected</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	62	7.3
Agree	343	40.2
No Opinion	129	15.1
Disagree	210	24.6
Strongly Disagree	109	12.8
Total	853	100.0
<u>Missing</u>	84	
Total	937	

Table 40. Farmers are adequately informed of domestic and export market risk for genetically modified crops.

<u>Adequately Informed</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	26	3.0
Agree	326	38.2
No Opinion	75	8.8
Disagree	314	36.8
Strongly Disagree	112	13.1
Total	853	100.0
<u>Missing</u>	84	
Total	937	

Table 41. Foods that have been produced using genetic modification pose a serious health hazard to consumers.

<u>Health Hazard</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	41	4.8
Agree	78	9.2
No Opinion	192	22.7
Disagree	339	40.0
Strongly Disagree	197	23.3
Total	847	100.0
<u>Missing</u>	90	
Total	937	

Table 42. Genetically modified seeds increase crop yields.

<u>Increase Crop Yields</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	62	7.3
Agree	383	44.8
No Opinion	183	21.4
Disagree	191	22.4
Strongly Disagree	35	4.1
Total	854	100.0
<u>Missing</u>	83	
Total	937	

Table 43. Genetically modified seeds cut operating expenses like fertilizers and herbicides.

<u>Cut Expenses</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	64	7.5
Agree	394	46.3
No Opinion	125	14.7
Disagree	218	25.6
Strongly Disagree	50	5.9
Total	851	100.0
<u>Missing</u>	86	
Total	937	

Table 44. A moratorium should be placed on the use of genetically modified crops until it is demonstrated that public health is safeguarded.

<u>Moratorium</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	136	15.9
Agree	232	27.2
No Opinion	156	18.3
Disagree	232	27.2
Strongly Disagree	98	11.5
Total	854	100.0
<u>Missing</u>	83	
Total	937	

Table 45. A moratorium should be placed on the use of genetically modified crops until it is demonstrated they can be kept segregated from non-genetically modified crops.

<u>Moratorium</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	109	12.8
Agree	196	23.0
No Opinion	169	19.8
Disagree	286	33.5
Strongly Disagree	93	10.9
Total	853	100.0
<u>Missing</u>	84	
Total	937	

Table 46. Scientists should be limited in the kinds of genetic manipulation they can do to crops.

<u>Limited Manipulation</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	158	18.8
Agree	229	27.2
Neither Agree nor Disagree	190	22.6
Disagree	197	23.4
Strongly Disagree	67	8.0
Total	841	100.0
<u>Missing</u>	96	
Total	937	

Table 47. Genetic material should not be owned by human beings.

<u>Not Owned</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	140	16.9
Agree	174	21.0
Neither Agree nor Disagree	288	34.8
Disagree	173	20.9
Strongly Disagree	52	6.3
Total	827	100.0
<u>Missing</u>	110	
Total	937	

Table 48. That which is natural is superior to that which is human-made.

<u>Natural is Superior</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	107	12.7
Agree	158	18.7
Neither Agree nor Disagree	274	32.5
Disagree	242	28.7
Strongly Disagree	62	7.4
Total	843	100.0
<u>Missing</u>	94	
Total	937	

Table 49. Naturally occurring crops, along with hybridized ones, are preferable to GMO crops.

<u>Natural Crops Preferable</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	109	12.9
Agree	194	23.0
Neither Agree nor Disagree	292	34.6
Disagree	205	24.3
Strongly Disagree	45	5.3
Total	845	100.0
<u>Missing</u>	92	
Total	937	

Table 50. GMOs promote land stewardship.

<u>Stewardship Promoted</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	45	5.4
Agree	241	29.2
Neither Agree nor Disagree	295	35.7
Disagree	150	18.2
Strongly Disagree	95	11.5
Total	826	100.0
<u>Missing</u>	111	
Total	937	

Table 51. GMOs represent an opportunity to reduce the use of farm chemicals.

<u>Reduce Chemicals</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	138	16.4
Agree	413	48.9
Neither Agree nor Disagree	122	14.5
Disagree	107	12.7
Strongly Disagree	64	7.6
Total	844	100.0
<u>Missing</u>	93	
Total	937	

Table 52. The choice of whether or not to plant GMO crops should be made by individual farmers.

<u>Choice to Plant</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	274	32.3
Agree	388	45.7
Neither Agree nor Disagree	92	10.8
Disagree	54	6.4
Strongly Disagree	41	4.8
Total	849	100.0
<u>Missing</u>	88	
Total	937	

Table 53. Consumers should be free to decide for themselves if GMO foods are safe to eat.

<u>Free to Decide</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	123	14.5
Agree	409	48.2
Neither Agree nor Disagree	151	17.8
Disagree	123	14.5
Strongly Disagree	43	5.1
Total	849	100.0
<u>Missing</u>	88	
Total	937	

Table 54. GMO farmers should take responsibility to prevent pollen drift that affects GMO-free farmers' crops.

<u>Responsible to Prevent Pollen Drift</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	188	22.1
Agree	288	33.8
Neither Agree nor Disagree	201	23.6
Disagree	120	14.1
Strongly Disagree	54	6.3
Total	851	100.0
<u>Missing</u>	86	
Total	937	

Table 55. There should be limits on the corporate liability for negative consequences of consuming GMO crops.

<u>Limited Corporate Liability</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	44	5.2
Agree	198	23.4
Neither Agree nor Disagree	215	25.4
Disagree	197	23.3
Strongly Disagree	191	22.6
Total	845	100.0
<u>Missing</u>	92	
Total	937	

Table 56. Farmers should have a basic right to plant any kind of seeds they wish natural, hybrid, or GMO.

<u>Right to Plant</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	246	28.9
Agree	406	47.8
Neither Agree nor Disagree	86	10.1
Disagree	68	8.0
Strongly Disagree	44	5.2
Total	850	100.0
<u>Missing</u>	87	
Total	937	

Table 57. Consumers should have a basic right to know if their food contains GMO ingredients.

<u>Right to Know</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	259	30.4
Agree	480	56.4
Neither Agree nor Disagree	87	10.2
Disagree	19	2.2
Strongly Disagree	6	.7
Total	851	100.0
<u>Missing</u>	86	
Total	937	

Table 58. Corporations that develop GMOs and sell the seeds to farmers should have a basic right to prevent farmers from saving these seeds and replanting them the following year.

<u>Right to Prevent</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	30	3.5
Agree	160	18.8
Neither Agree nor Disagree	180	21.2
Disagree	265	31.1
Strongly Disagree	216	25.4
Total	851	100.0
<u>Missing</u>	86	
Total	937	

Table 59. GMOs promote family farming as much as they promote industrial agriculture.

<u>Promote Family Farming</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	30	3.5
Agree	226	26.7
Neither Agree nor Disagree	266	31.4
Disagree	185	21.8
Strongly Disagree	141	16.6
Total	848	100.0
<u>Missing</u>	89	
Total	937	

Table 60. GMOs promote an unjust food production system.

<u>Promotes Unjust System</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	76	9.0
Agree	99	11.8
Neither Agree nor Disagree	325	38.7
Disagree	273	32.5
Neither Agree nor Disagree	67	8.0
Total	840	100.0
<u>Missing</u>	97	
Total	937	

Table 61. The use of GMOs should be promoted in developing countries in order to improve the incomes of small farmers.

<u>Promoted in Developing Countries</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	44	5.2
Agree	209	24.6
Neither Agree nor Disagree	324	38.2
Disagree	153	18.0
Strongly Disagree	118	13.9
Total	848	100.0
<u>Missing</u>	89	
Total	937	

Table 62. The spread of GMOs worldwide unfairly increases the power of corporations over farmers in developing countries.

<u>Increases Power</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	150	17.7
Agree	252	29.7
Neither Agree nor Disagree	293	34.6
Disagree	133	15.7
Strongly Disagree	20	2.4
Total	848	100.0
<u>Missing</u>	89	
Total	937	

Table 63. Corporations should be allowed to patent their genetic innovations.

<u>Corporations Allowed to Patent</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	29	3.4
Agree	316	37.2
Neither Agree nor Disagree	246	28.9
Disagree	162	19.1
Strongly Disagree	97	11.4
Total	850	100.0
<u>Missing</u>	87	
Total	937	

Table 64. All seed genetics should be freely available to the public.

<u>Seed Genetics Freely Available</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	107	12.7
Agree	315	37.3
Neither Agree nor Disagree	248	29.4
Disagree	135	16.0
Strongly Disagree	39	4.6
Total	844	100.0
<u>Missing</u>	93	
Total	937	

Table 65. GMOs should be promoted worldwide to produce more food for hungry people.

<u>GMOs for Hungry People</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	54	6.4
Agree	266	31.3
Neither Agree nor Disagree	288	33.9
Disagree	133	15.6
Strongly Disagree	109	12.8
Total	850	100.0
<u>Missing</u>	87	
Total	937	

Table 66. GMOs are good because they are the latest scientific technological advancement made by humans.

<u>Technological Advancement</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	27	3.2
Agree	187	22.0
Neither Agree nor Disagree	324	38.1
Disagree	187	22.0
Strongly Disagree	125	14.7
Total	850	100.0
<u>Missing</u>	87	
Total	937	

Table 67. We should release GMO crops only when we are absolutely sure there is minimum risk associated with their use.

<u>Released if Minimum Risk</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	245	28.8
Agree	485	57.1
Neither Agree nor Disagree	79	9.3
Disagree	30	3.5
Strongly Disagree	11	1.3
Total	850	100.0
<u>Missing</u>	87	
Total	937	

Table 68. We should base our decisions about GMOs on basic ethical ideals rather than on the GMO's uses or consequences.

<u>Use Based on Ethical Standards</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	73	8.6
Agree	237	27.9
Neither Agree nor Disagree	300	35.4
Disagree	189	22.3
Strongly Disagree	49	5.8
Total	848	100.0
<u>Missing</u>	89	
Total	937	

Table 69. GMOs are not inherently good or bad, but rather should be evaluated in terms of their outcomes.

<u>Evaluated on Outcomes</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	126	14.8
Agree	497	58.4
Neither Agree nor Disagree	149	17.5
Disagree	46	5.4
Strongly Disagree	33	3.9
Total	851	100.0
<u>Missing</u>	86	
Total	937	

Table 70. Religious organizations should have a say in how modern genetic engineering is regulated.

<u>Religions Should have Say</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	36	4.3
Agree	124	14.9
No Opinion	207	24.8
Disagree	308	37.0
Strongly Disagree	158	19.0
Total	833	100.0
<u>Missing</u>	104	
Total	937	

Table 71. Does your church or denomination have an official position on genetically modified crops?⁹

<u>Church has Official Position</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Yes	15	1.8
No	342	40.9
Do Not Know	400	47.8
N/A	79	9.4
Total	836	100.0
<u>Missing</u>	101	
Total	937	

⁹Frequencies and percentages for “Church Affiliation” are not provided here due to the large number of answers to this open-ended question.

Table 72. How familiar are you with your church or denomination's official position on genetically modified crops?

<u>Extent Familiar</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Very Familiar	1	.1
Somewhat Familiar	8	1.0
Slightly Familiar	4	.5
Not Familiar at All	2	.2
N/A	820	98.2
Total	835	100.0
<u>Missing</u>	102	
Total	937	

Table 73. What is your church or denomination's official position on genetically modified crops?

<u>Official Position</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Favors	3	.4
Somewhat Favors	4	.5
Neutral	3	.4
Somewhat Opposes	4	.5
Strongly Opposes	1	.1
N/A	820	98.2
Total	835	100.0
<u>Missing</u>	102	
Total	937	

Table 74. To what extent do you agree or disagree with your church or denomination's position on genetically modified crops?

<u>Agree on Position</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Strongly Agree	6	.7
Somewhat Agree	3	.4
Neither Agree nor Disagree	3	.4
Somewhat Disagree	1	.1
Strongly Disagree	2	.2
N/A	820	98.2
Total	835	100.0
<u>Missing</u>	102	
Total	937	

Table 75. To what degree are you attempting to follow your church or denomination's position on genetically modified crops in your farming practices?

<u>Follow Position</u>	<u>Frequency</u>	<u>Valid Percent of Sample</u>
Follow them Very Closely	4	.5
Follow them Somewhat Closely	6	.7
Not Follow them Very Closely	1	.1
Not Follow them at All	3	.4
N/A	820	98.3
Total	834	100.0
<u>Missing</u>	103	
Total	937	