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ENHANCING EXPORT POTENTIAL FOR NORTHERN PLAINS MUSTARD

David L. Watt
Randall S. Sell
Steven E. Edwardson

Department of Agricultural Economics • Agricultural Experiment Station
North Dakota State University • Fargo, ND 58105-5636

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Highlights

The vast array of crops, which are successfully produced in North Dakota, places this state in an excellent position to expand export markets for numerous commodities and their value-added products.

Mustard is produced predominantly in Canada, China, Europe, India, the United Kingdom, and the United States. North Dakota is the leading producer of mustard in the United States. Mustard production is concentrated in the north central area of the state.

Mustard is a minor crop of regional economic importance to North Dakota. The combination of suitable production areas and processing capabilities for Northern Plains mustard makes development of export enhancement strategies a viable option.

Mustard is economically competitive with spring wheat on North Dakota farm program flex acres. Canada has higher direct costs than North Dakota producers; however, Canada's total cost of production is lower than North Dakota's. From 1991 through 1993, mustard has contributed about 1.1 million dollars annually to North Dakota's economy. Mustard is an excellent candidate for export expansion since North Dakota mustard producers have a lower direct cost than Canadian producers.

This report focuses on market assessment of mustard for export. Results indicate that export potential exists to further strengthen North Dakota's position as a producer and processor of value-added mustard. Germany and the United Kingdom are the two main countries which should be targeted for additional export market development. Industry structure in Europe indicates an educational program and targeted marketing to the companies producing spices for processed meats in Germany and Belgium are entry points that could yield high returns. Future research on Eastern Europe supply estimation and into World Trade Center (WTC) leads are recommended.

Enhancing Export Potential for Northern Plains Mustard

David L. Watt, Randall S. Sell, and Steven E. Edwardson*

Introduction

Diversification is a key component to reducing risk and enhancing an agricultural economy. Cropping systems, including a mix of conventional and alternative crops, can assist farmers in maintaining viable farming operations. However, for farmers to include alternative crops (e.g., buckwheat, mustard) in their cropping systems, domestic and international markets must be established for these alternative crops and their associated value-added products.

We will discuss market development for alternative crops as a two-phase process. The first phase (which is evaluatory in nature) focuses on gathering the basic information to develop a comprehensive understanding of the domestic and international market situations for a given crop. The second phase focuses on applying preliminary market information for use in developing market entry and/or enhancement strategies. This is especially important in assessing the export potential for a value-added agricultural product.

This report presents an evaluation of export market potential for Northern Plains mustard. An assessment of world mustard production is presented along with the regional economic impact of mustard to Northern Plains agriculture. Uses of mustard are presented along with United States' exports of mustard to major regions of the world. Mustard product flows from production to consumption levels are presented. The cost of production for yellow mustard in North Dakota and Canada is presented. Opportunities for market growth are discussed, followed by strategies for market growth enhancement. Summary comments are presented along with suggested future research directions for Northern Plains mustard.

North Dakota Mustard Production

Three principal types of mustard are produced in North Dakota: yellow, brown, and oriental. Of the three, yellow mustard is the predominant type. Mustard is used to produce dry (39 percent) and prepared mustard (61 percent) (Forhan and Tisdale 1989). Alternative uses of the three types of mustard include seasonings, flavorings, emulsifier, and water binding agent (Appendix A).

Mustard production in North Dakota tends to be concentrated in the north central part of the state (Figure 1). Approximately 66 percent of all mustard produced in North Dakota is produced in Bottineau, Ramsey, and Towner Counties (Table 1).

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*Watt is associate professor and Sell is research associate, in the Department of Agricultural Economics, North Dakota State University, Fargo. Edwardson is vice president of research and development, MINN-DAK Growers Ltd., Dickinson, ND.

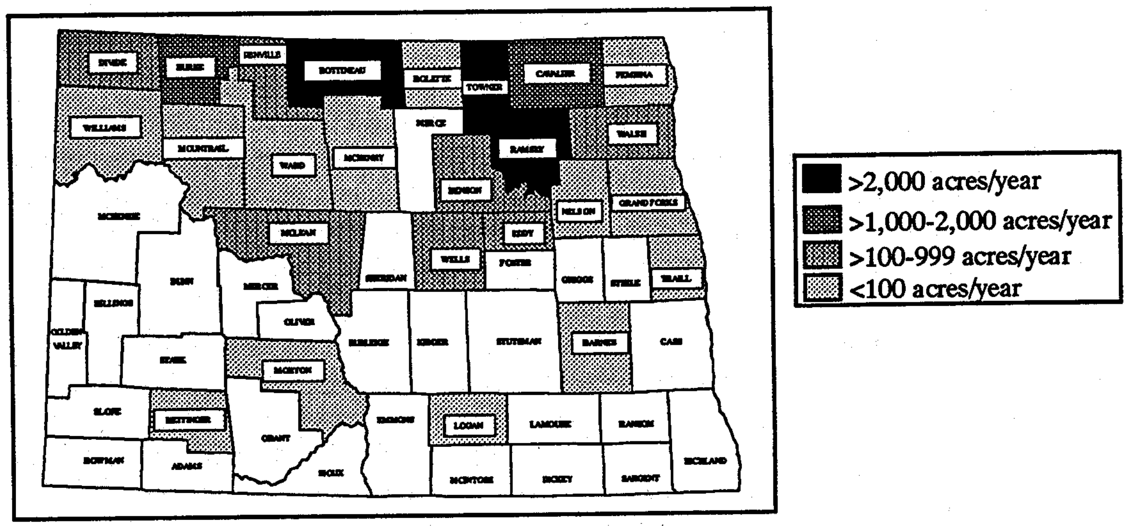

Figure 1. Average Acres of Mustard Production in North Dakota, 1991-1993

Source: North Dakota State Agricultural Stabilization and Conservation Service (1994).

Mustard makes a significant contribution to the regional agricultural economy of northeast and north central North Dakota. The majority of North Dakota mustard production (85 percent) is concentrated in the northeast and north central parts of the state, within the counties of Bottineau, Ramsey, Cavalier, Towner, and Burke. On average from 1991 to 1993, mustard contributed 1.1 million dollars annually to North Dakota's economic base (Table 2). According to Coon et al. (1989), the gross receipts multiplier for crop production in North Dakota is 3.6851. This direct impact results in a total economic impact to North Dakota of 4.1 million dollars (Coon et al. 1989).

Table 1. Regional Distribution of Mustard in North Dakota, 1991-1993

County	Years 1991	1992	1993	Average	Percent of Total
Bottineau	3,393	5,197	4,792	4,461	30.52
Ramsey	2,519	1,983	3,385	2,629	17.99
Towner	3,217	2,213	2,240	2,557	17.49
Cavalier	1,824	1,105	1,634	1,521	10.41
Burke	990	948	1,776	1,238	8.47
Renville	605	391	460	485	3.32
Benson	474	479	220	391	2.67
Walsh	406	83	349	279	1.91
McLean	0	280	163	148	1.01
Eddy	60	146	224	143	0.98
Williams	78	13	332	141	0.96
Divide		0	236	117	1180.80
Pembina	72	169	0	80	0.55
Mountrail	210	0	15	75	0.51
Barnes	210	0	0	70	0.48
Grand Forks	43	149	0	64	0.44
Ward	56	0	97	51	0.35
Hettinger	22	79	44	48	0.33
McHenry	0	0	105	35	0.24
Nelson	0	0	100	33	0.23
Morton	0	0	78	26	0.18
Logan	34	0	0	11	0.08
Rolette	0	29	0	10	0.07
Traill	0	0	6	2	0.01
Golden Valley	0	0	1	0	0.00
	14,213	13,500	16,138	14,617	100.00

Source: North Dakota Agricultural Stabilization and Conservation Service (1991-1993).

Table 2. Contribution of Mustard to North Dakota

Year	Acres	Yield	Price	Gross Production	Value	Economic Impact
		(lb/ac)	($/cwt)	(lbs)		
1991	14,213	684	$10.50	9,721,692	$1,020,778	$3,761,668
1992	13,500	684	11.50	9,234,000	1,061,910	3,913,245
1993	16,138	684	11.50	11,038,392	1,269,415	4,677,922
Avg:	14,617	684	$11.17	9,998,028	$1,117,368	$4,117,611

Source: North Dakota Agricultural Stabilization and Conservation Service (1994) and Edwardson (1993).

World Mustard Production

Developing a thorough assessment of world mustard production is important in developing export enhancement strategies. This section provides basic information on mustard production regions in the world.

Mustard produced in various locations in the world basically follows the same marketing channels (Lovas 1993). Mustard marketing channel proceeds from farm level raw seed through various processing stages (Figure 2). Farm level production (e.g., raw seed) is delivered to the processor. The processor cleans the mustard seed and sells it as 1) whole seed; 2) ground mustard, which includes the bran (hull); and 3) mustard flour. The processed mustard products are marketed as food ingredients to a variety of food companies.

Major mustard-producing regions of the world include Canada, United States, and Europe (Figure 3). Canada, the United States, and Europe collectively represent 95 percent of the world's mustard-producing regions (Lovas 1993).

World mustard production is estimated at 188,000 metric tons annually, with Canada accounting for 85 percent of the world mustard production (Lovas 1993). North Dakota produces about 4,500 metric tons annually, or about 3 percent of world output. Although this is a relatively small market share, further exploitation of this crop in North Dakota, especially through enhanced market strategies of value-added mustard products, could improve contributions to regional economies. North Dakota already has a definite niche in the world mustard market, and this niche could be further enhanced.

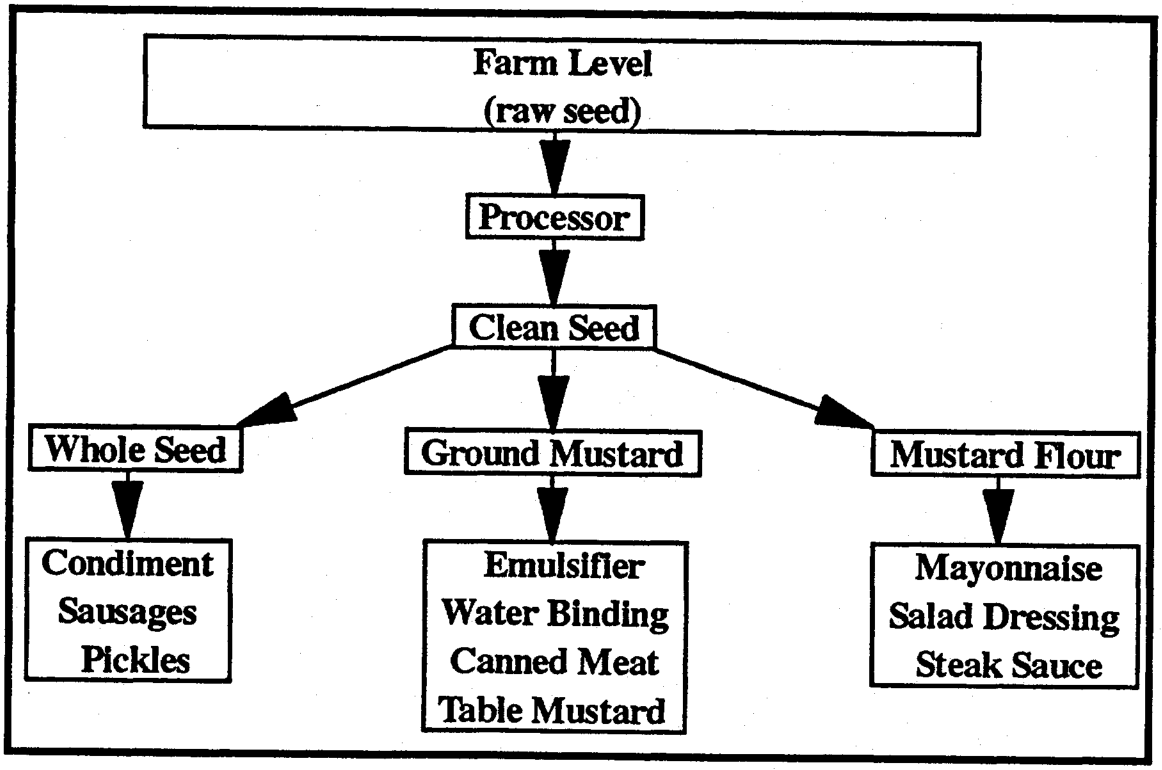

Figure 2. Mustard Product Flows

Canadian mustard production ranged between 121,000 and 250,000 metric tons from 1985 to 1992 (Table 3). Saskatchewan producers produce the greatest amount of mustard. The annual average mustard production in Canada for 1985 through 1992 was 393,488 acres or 159,238 metric tons (Saskatchewan Agriculture and Food 1988-1992). Hungary, France, and Germany also produce mustard, most of which is consumed in the EC-12 countries (Lovas 1993, Boshnakova 1993). Research conducted for this project indicates that reliable estimates of mustard production in Europe are difficult to obtain due to limited records (Boshnakova 1993).

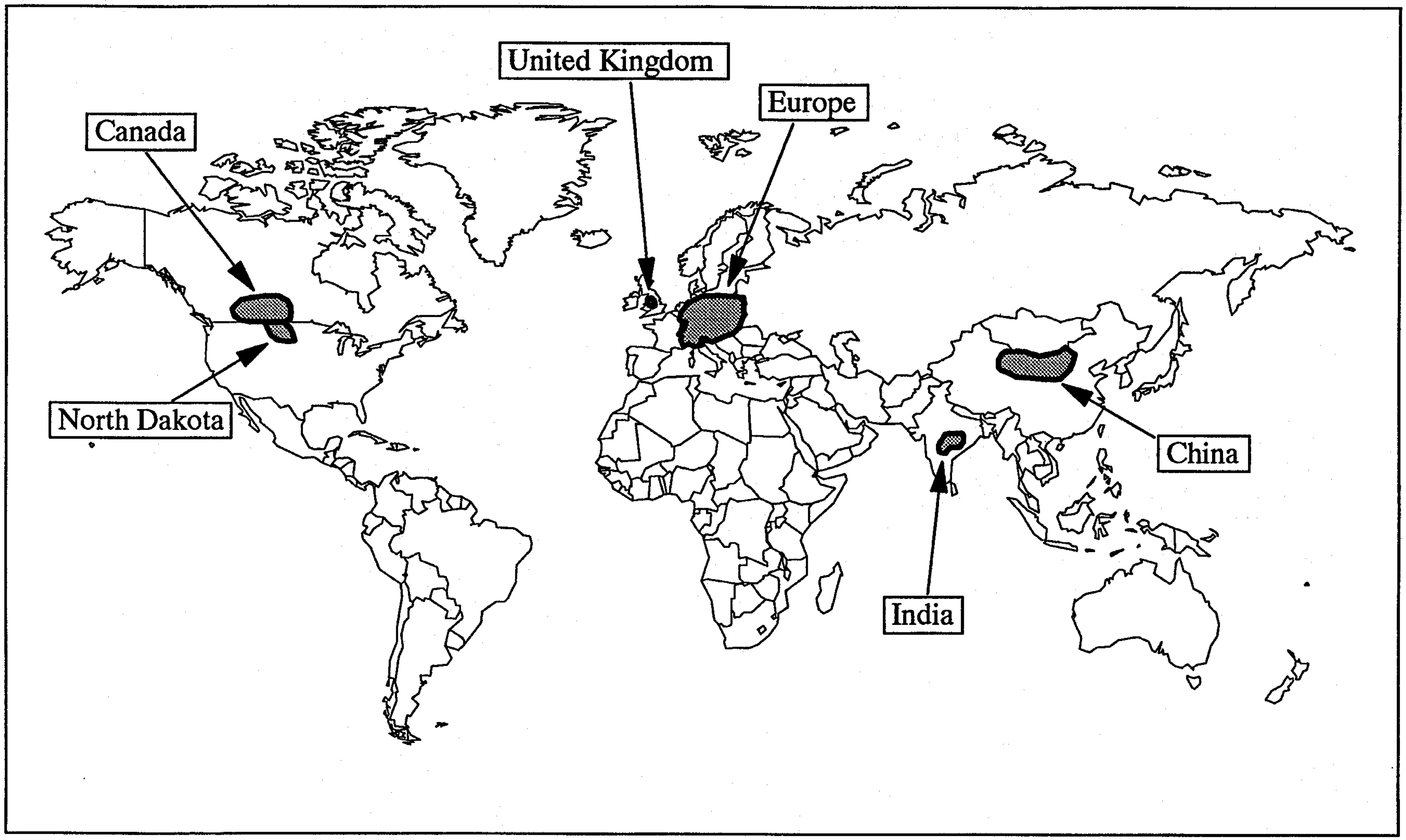

Figure 3. Major Mustard-producing Regions of the World
Source: Forhan and Tisdale (1989).

Table 3. Canadian Mustard Production by Crop Year

Item	1985	1986	1987	1988	1989	1990	1991	1992	Average
Acres Planted									
Alberta	60,000	70,000	55,000	70,000	70,000	80,000	59,900	45,000	63,738
Saskatchewan	250,000	350,000	210,000	325,000	400,000	465,000	202,700	265,000	308,463
Manitoba	30,000	35,000	15,000	15,000	24,000	25,000	16,300	10,000	21,288
Total	340,000	455,000	280,000	410,000	494,000	570,000	278,900	320,000	393,488
Production (metric tons)									
Alberta	15,000	32,700	24,500	22,700	29,500	34,500	30,500	20,100	26,188
Saskatchewan	95,300	176,900	100,200	90,700	117,900	201,800	81,700	121,000	123,188
Manitoba	15,000	17,200	7,700	6,000	7,400	13,200	8,900	3,500	9,863
Total	125,300	226,800	132,400	119,400	154,800	249,500	121,100	144,600	159,238

Source: Saskatchewan Agriculture and Food (1988, 1989, 1990, 1991, 1992).

The United States accounts for 44 percent of Canadian mustard exports (Table 4). The remainder of annual Canadian exports typically goes to Europe and Japan. Enhancing exports of U. S. mustard to Europe and Japan may be difficult due to established market channels with Canada, thus posing a potential barrier to trade.

Canada exports nearly 75 percent of its mustard production (Table 5). This reflects the fact that Canada is well established in the mustard export market. Although this establishment may impose barriers to trade, U.S. companies may be able to develop their own niche, which would increase market share relative to the production in the Northern Plains (U.S.) states.

Table 4. Canadian Mustard Exports and Destinations

Region	1989/90	1990/91	1991/92	Average	Percent
	metric tons				
United States	51,273.3	61,786.3	53,791.0	55,616.9	44.82
Belgium/Luxembourg	18,282.2	24,059.9	14,986.7	19,109.6	15.40
Northern Europe	16,499.6	11,200.7	10,021.9	12,574.1	10.13
Japan	8,193.9	10,602.8	9,006.5	9,267.7	7.47
West Germany	9,244.3	1,846.9	6,948.2	6,013.1	4.85
Other	23,901.3	17,445.3	23,137.4	21,494.7	17.32
Total Exports:	127,394.6	126,941.9	117,891.7	124,076.1	

Source: Saskatchewan Agriculture and Food (1992).

Table 5. Mustard Supply and Disposition for Western Canada

Crop Year	Aug 1 Stocks	Acres	Production	Total Supply	Exports	Domestic Use	Seed	Feed, Waste and Dockage	July 31 Stocks	Export Value
---mt---			---------- Metric Tons ----------							
1982/83	10,000	157,000	76,500	86,500	74,200	4,200	1,293	3,920	2,888	NA
1983/84	2,888	235,000	86,400	89,288	74,200	4,410	1,909	4,717	4,052	NA
1984/85	4,052	347,000	112,400	116,452	89,000	4,631	1,870	9,363	11,588	NA
1985/86	11,588	340,000	125,300	136,888	122,600	4,862	2,503	2,095	4,829	$317.00
1986/87	4,829	455,000	226,800	231,629	120,600	45,105	1,540	16,571	47,813	$335.00
1987/88	47,813	280,000	132,400	180,213	119,265	34,862	2,255	6,165	17,666	$286.00
1988/89	17,666	410,000	119,400	137,066	91,934	17,605	2,717	2,902	21,908	$344.00
1989/90	21,908	494,000	154,800	176,708	127,395	27,454	3,135	6,747	11,977	$383.00
1990/91	11,977	570,000	249,500	261,477	126,942	16,445	1,534	7,167	109,388	$366.00
1991/92	10,938	278,927	121,100	132,038	117,892	17,267	1,760	7,478	86,091	$336.00
1992/93	86,091	320,000	144,600	230,691	120,000	18,130	1,815	27,474	63,272	---NA---
Average		353,357	140,836	161,723	107,639	17,725	2,030	8,600	34,679	$338.14

Source: Saskatchewan Agriculture and Food (1992).

Destinations of Northern Plains mustard to consumption areas indicate mustard products flow to major demographic areas in the United States as well as to Australia, the European Communities, Great Britain, and Japan (Figure 4). Typically, processed mustard leaves the Northern Plains as an intermediate product (e.g., ground mustard) which is used as an ingredient in additional products, such as processed meats (Appendix A). Mustard exported to other countries is also used as an ingredient in other products (Appendix A).

On average, from 1990 through 1993, the United States received more than 99 percent of all mustard seed imports from Canada (U.S. Bureau of the Census Trade Data 1993). The United States also received most (84 percent) of its imported mustard flour from Canada over the same time frame (Table 6). A smaller percentage of prepared mustard products comes from Canada (26 percent) with France representing the greatest amount of prepared mustard imports into the United States (62 percent) (Table 7).

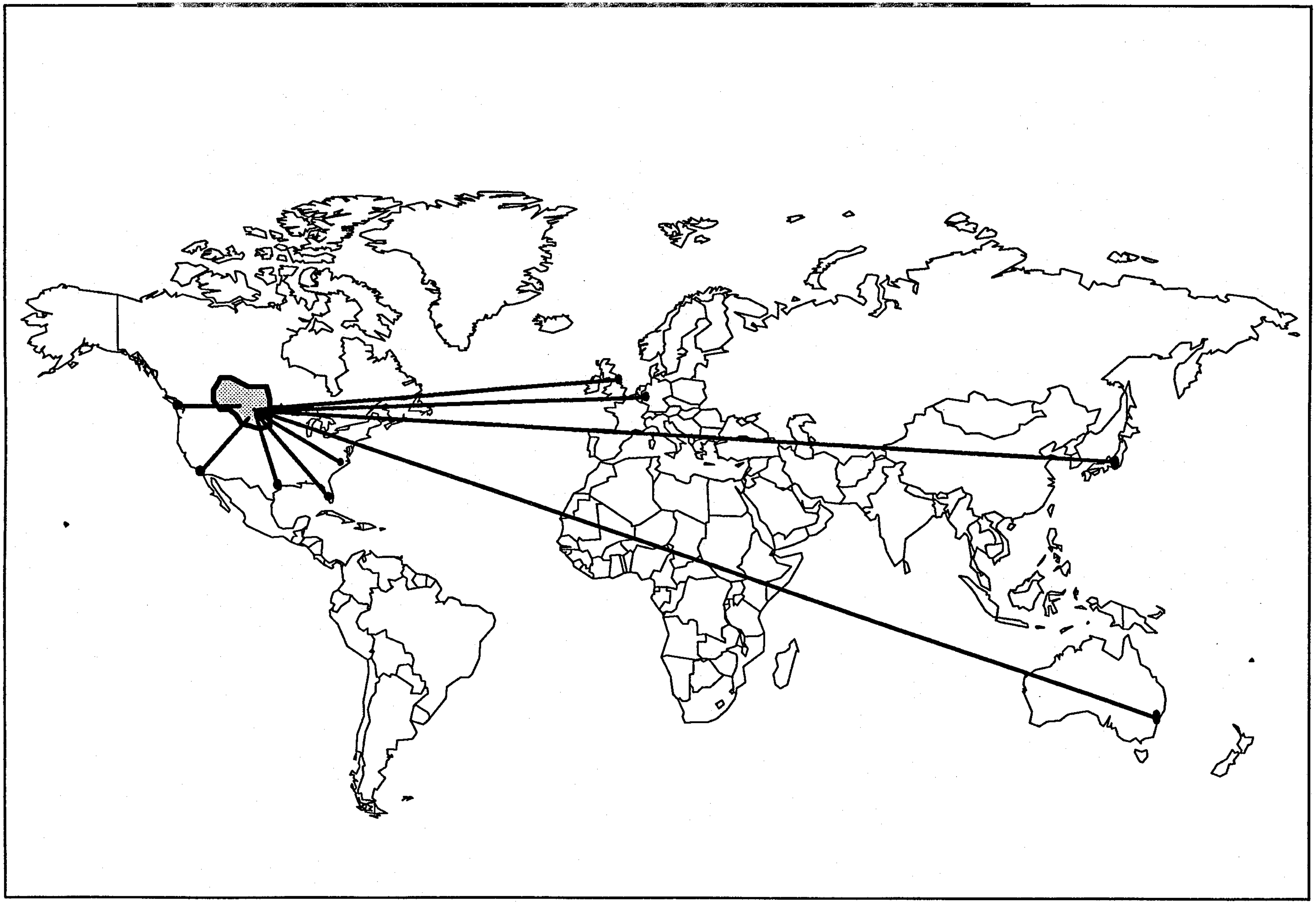

Figure 4. Destinations of Northern Plains Mustard
Source: Edwardson (1993), Lovas (1993).

Table 6. Mustard Flour and Meal Imports From Country of Origin to United States, 1990-1993

Country	Average			Total Lbs	Total $
	($ 000)	(Lbs)	($/lb)	(%)	(%)
World	4,180	9,655,276	0.4329	100.00	100.00
Canada	2,645	8,097,302	0.3266	83.86	63.27
United Kingdom	1,222	1,190,211	1.0269	12.33	29.24
France	143	290,213	0.4910	3.01	3.41
Japan	134	44,003	3.0396	0.46	3.20

Source: U.S. Bureau of the Census Trade Data (1993).

Note: Countries are ranked in declining order of total dollars. Those countries representing less than .5 percent are not shown.

Table 7. Prepared Mustard Product Imports From Country of Origin to United States, 1990-1993

Country	Average			Total Lbs	Total $
	($ 000)	(Lbs)	($/lb)	(%)	(%)
World	6,168	8,005,575	0.7704	100.00	100.00
France	3,811	6,356,948	0.5995	79.41	61.79
Canada	1,629	831,264	1.9597	10.38	26.41
Germany, West	186	152,855	1.2168	1.91	3.02
Thailand	123	257,437	0.4758	3.22	1.99
United Kingdom	90	51,944	1.7326	0.65	1.46
Japan	82	22,594	3.6403	0.28	1.33
China (Taiwan)	62	87,913	0.7081	1.10	1.01
Belgium	42	82,850	0.5069	1.03	0.68
Hong Kong	37	39,053	0.9474	0.49	0.60

Source: U.S. Bureau of the Census Trade Data (1993).

Note: Countries are ranked in declining order of total dollars. Those countries representing less than .5 percent are not shown.

The United States exported almost 50 percent of all mustard seed to Mexico from 1990 through 1993 (Table 8). However, U.S. annual exports averaged only 2.1 million pounds from 1990 to 1993, while total U.S. mustard flour imports averaged 9.7 million pounds over the same time frame. Mustard flour and prepared mustard exports were not categorized separately as imports were. The United States exported 3.7 million pounds of mustard flour and prepared mustard products to Canada annually from 1990 to 1993 (Table 9).

Table 8. Mustard Seed Exports From United States to Country of Destination, 1990-1993

Country	Average			Total Lbs	Total $
	($ 000)	(Lbs)	($/lb)	(%)	(%)
World	424	2,187,969	0.1938	100.00	100.00
Mexico	194	918,014	0.2113	41.96	45.75
Canada	116	917,355	0.1259	41.93	27.24
Japan	31	31,747	0.9607	1.45	7.19
Costa Rica	12	44,665	0.2575	2.04	2.71
Hong Kong	12	38,077	0.3020	1.74	2.71
Brazil	9	22,354	0.3802	1.02	2.00
Colombia	8	16,914	0.4582	0.77	1.83
Panama	8	14,785	0.5073	0.68	1.77
Venezuela	7	34,483	0.2102	1.58	1.71
Thailand	6	23,554	0.2547	1.08	1.42
Philippines	5	12,861	0.4082	0.59	1.24
El Salvador	4	16,266	0.2305	0.74	0.88
Saudi Arabia	3	10,725	0.2564	0.49	0.65
Spain	3	10,977	0.2278	0.50	0.59
Guatemala	2	10,977	0.2050	0.50	0.53
United Kingdom	2	9,748	0.2308	0.45	0.53

Source: U.S. Bureau of the Census Trade Data (1993).

Note: Countries are ranked in declining order of total dollars. Those countries representing less than .5 percent are not shown.

Table 9. Mustard Flour, Meal and Prepared Product Exports From United States to Country of Destination, 1990-1993

Country	Average			Total Lbs	Total $
	($ 000)	(Lbs)	($/lb)	(%)	(%)
World	4,694	9,255,669	0.5071	100.00	100.00
Canada	1,752	3,715,885	0.4716	40.15	37.33
United Kingdom	457	913,538	0.5000	9.87	9.73
Greece	273	341,172	0.7987	3.69	5.81
Japan	247	487,527	0.5066	5.27	5.26
Singapore	205	262,488	0.7819	2.84	4.37
Korea, South	201	397,311	0.5046	4.29	4.27
Mexico	194	485,602	0.3985	5.25	4.12
China (Taiwan)	117	217,625	0.5365	2.35	2.49
Saudi Arabia	104	376,654	0.2755	4.07	2.21
Thailand	103	137,019	0.7517	1.48	2.19
French Polynesia	83	129,048	0.6432	1.39	1.77
Lebanon	73	133,602	0.5445	1.44	1.55
Germany, West	70	171,536	0.4095	1.85	1.50
Hong Kong	65	119,716	0.5430	1.29	1.38
Bahamas	59	62,650	0.9378	0.68	1.25
Colombia	49	91,518	0.5327	0.99	1.04
Honduras	47	84,082	0.5619	0.91	1.01
United Arab Emirates	46	55,360	0.8309	0.60	0.98
Italy	41	49,153	0.8392	0.53	0.88
Argentina	39	58,951	0.6573	0.64	0.83
Australia	38	140,037	0.2678	1.51	0.80
Bolivia	26	72,996	0.3596	0.79	0.56
Costa Rica	26	63,011	0.4047	0.68	0.54
Barbados	25	26,418	0.9463	0.29	0.53

Source: U.S. Bureau of the Census Trade Data (1993).

Note: Countries are ranked in declining order of total dollars. Those countries representing less than .5 percent are not shown.

The majority of U.S. mustard production is concentrated in the Northern Plains states of North Dakota, Montana, and Minnesota (Berglund and Schneiter 1993, Lovas 1993). Since mustard is a cool-season crop (Berglund and Schneiter 1993, Forhan and Tisdale 1989), production potential in other areas of the United States is limited. Of the three states, North Dakota produces the majority of the mustard in the Northern Plains (Edwardson 1993, Lovas 1993). Montana's and Minnesota's production varies, suggesting that production is relatively risky or that mustard does not compete well economically against more conventional crops.

Exporting processed mustard flour or ground mustard creates more economic activity than exporting mustard seed. The average value of mustard seed from 1991 to 1993 was $11.17 per hundred weight (Table 2) while the average value of exported mustard flour from 1990 to 1993 was $50.71 per hundred weight (Table 9). One hundred pounds of mustard seed will yield about 83 pounds of mustard flour. Conversion of mustard seed to flour results in an average value-added of $30.92 per hundred weight from processing the mustard seed. If all mustard produced in North Dakota was exported as flour instead of seed, an additional 13.7 million dollars in economic activity could be generated.

Cost of Production and Competitiveness

For producers to consider mustard as an alternative crop, it must be relatively profitable compared to alternative crops. The 1990 U.S. farm legislation made crops like mustard a more economically viable option by eliminating deficiency payments on flex acres and allowing producers to raise 'non-program' crops on those acres. When mustard is compared with spring wheat in north central North Dakota, it cannot compete with spring wheat if deficiency payments are included (Appendix B). However, without spring wheat deficiency payments, mustard has a greater return over direct and total costs (Appendix B).

The net return per dollar invested is a ratio which measures how efficiently a given crop enterprise utilizes input dollars. The ratio is return over total cost divided by total cost. Net return per dollar invested for mustard is $0.50 per dollar invested versus $0.30 for wheat, not including deficiency payments (Appendix B). If deficiency payments are included, wheat's efficiency ratio is about $0.60 per dollar invested. Mustard is a more efficient crop to raise on flex acres than wheat.

The average price of mustard paid to Canadian farmers from 1991 to 1993 was $4.84 per cwt (in U.S. dollars) (Barber 1993). In contrast, farm prices for mustard from 1991 to 1993 in North Dakota averaged $11.17 per cwt (F.O.B. Grand Forks, ND) (Edwardson 1993). This amounts to a $6.33 per cwt. (U.S.) price advantage to the U.S. producer. Canadian producers also have direct production costs which are typically 15 to 35 percent higher than North Dakota producers (Edwardson 1992, Lovas 1993). Canadian producers typically use higher rates of fertilizer and more pesticides than U.S. producers. Consequently, U.S. producers can typically compete favorably with Canadian producers due to lower direct production costs (Table 10).

Table 10. Canadian and North Dakota Yellow Mustard Enterprise Budgets in 1993

	Canadian[1]	North Dakota
Market Yield (cwt)	11.6	12.2
Market Price	$4.84	$10.93
Market Income	$56.27	$133.35
Direct Costs		
Seed	$2.84	$3.20
Herbicides	6.37	5.99
Fertilizer	2.72	5.24
Crop Insurance	3.47	4.00
Fuel and Lubrication	2.10	4.95
Repairs	7.91	8.24
Custom Work and Labor	3.02	
Miscellaneous	6.91	1.05
Operating Interest	1.01	1.43
Total Direct Costs	$36.35	$34.10
Indirect Costs		
Misc. Overhead	$1.51	$3.50
Machinery Depreciation	7.75	14.22
Machinery Investment	6.20	6.16
Property Taxes	2.47	3.93
Land Investment	13.95	26.80
Total Indirect Costs	$31.89	$54.61
Total All Costs	$68.23	$88.71
Direct Costs (BEP) per cwt	$3.13	$2.80
Total Cost (BEP) per cwt	$5.87	$7.27

Source: Canadian budget, Barber (1993); North Dakota budget, Haugen et al. (1993).

[1]Canadian dollars have been converted to U.S. dollars.

Note: Enterprise budgets do not include government farm program payments.

Production practices in eastern Europe are similar to those in the United States (Budin 1994). Mustard in eastern Europe typically follows wheat or a legume in the crop rotation. Soil preparation begins in the fall, before planting the mustard, with disk harrowing and plowing up to 11 inches deep. About 1/3 of the nitrogen and 2/3 of the potassium and phosphorus are applied in the fall. The remaining fertilizer requirements are applied just before planting. Mustard is generally planted in 5 inch rows as early in the growing season as possible. Herbicides and insecticides are applied as needed. Harvesting is done with a large grain combine. Because land costs, government regulations, and yields were not available, profitability of European mustard production relative to the United States was not determined.

Opportunities for Mustard Market Growth

Evaluation of trade leads provides information on potential market growth areas for Northern Plains mustard. Computerized data banks provide numerous types of trade leads for a variety of products. The Best Market Prospect Analysis (BMPA) and Market Intelligence Services data provide reliable market information trends for mustard.

U. S. exports of mustard and mustard seed have been increasing. Export projections for mustard flour and prepared mustard were derived for regional and leading country markets using the BMPA model (U.S. Bureau of the Census Trade Data 1993).

The value of U.S. exports of mustard flour meal and prepared mustard from 1989 through 1992 has increased steadily (Table 11). The top five U.S. export markets in 1992 (in order) were Canada, the United Kingdom, Greece, Korea, and Mexico. From 1989 through 1992, the value of U.S. exports of mustard flour meal and prepared mustard to Canada alone increased from $134,000 dollars (U.S.) to $1,907,000 dollars.

United States export projections for mustard flour and prepared mustard to all countries indicate an increase in value of mustard exports is likely through 1998 (Figure 5). The U.S. mustard flour and prepared mustard export markets are fairly concentrated (Figure 6). Over 60 percent of U.S. mustard flour and prepared mustard exports were concentrated in the top eight markets. Focusing on the regional and specific country markets listed in Table 11 would provide the information necessary to determine the potential to expand exports of Northern Plains mustard (both raw and processed seed) to these markets.

Table 11. United States Mustard Flour and Prepared Mustard (Excluding Mustard Seed) Export Markets

Leading Regional Markets	1989	1990	1991	1992
	($,000)			
North America	257	1,034	1,934	2,142
EC-12	372	685	824	834
The Four Tigers of Asia	388	655	442	528
South America	68	88	117	283*
Middle East	154	164	388*	255
Asian-4 Nations	77	128	59	190
Central America	148	81	63	163
Oceania and Pacific Islands	100	132*	131	123
Japan	129	304	159	122
Caribbean Islands	88	73	86	117
Non-EC West Europe	40	20	42	44
North Africa	0	15	16	21*
South Asia	33*	0	0	0
Sub-Sahara Africa	0	0	5	0
Total Exports	1,856	3,384	4,269	4,823

Leading Country Markets	1989	1990	1991	1992
	($,000)			
Canada	134	850	1,766	1,907
United Kingdom	83	399	455	481
Greece	239	183	289	273
Korea, Republic of	117	273*	91	260
Mexico	123	184	168	235*
Singapore	171	232*	184	184
Japan	129	304	159	122
Thailand	54	90	42	108
Lebanon	51	43	66	91
Honduras	67	6	3	83
Bolivia	0	0	0	80*
French Pacific Islands	62	68	77	74
Bahamas	58	53	48	68*
Argentina	0	0	0	67
Colombia	43	61	49	64
Rest of World	526	637	874	726

Source: U.S. Bureau of the Census Trade Data (1993).

*Denotes highest levels since 1970.

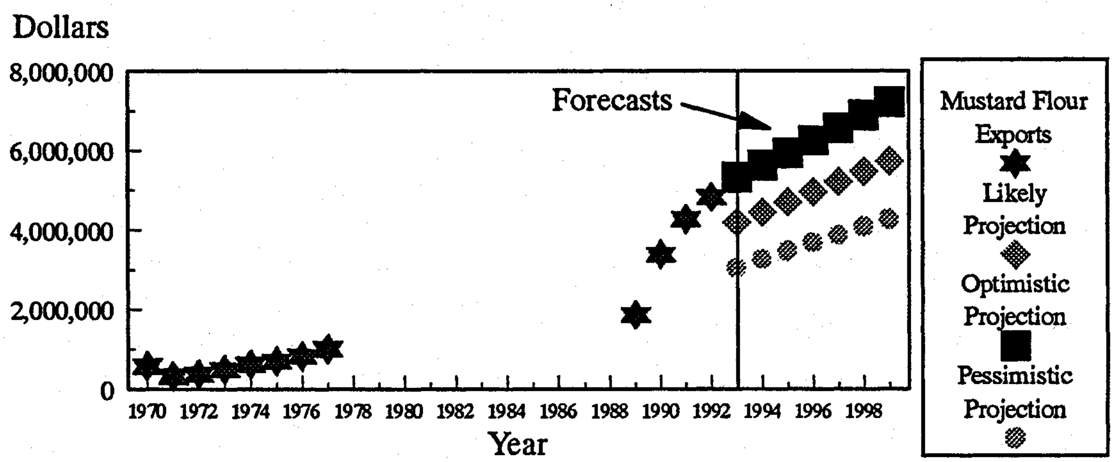

Figure 5. United States Export Projections for Mustard Flour and and Prepared Mustard, excluding Mustard Seed

Source: U.S. Bureau of the Census Trade Data, Trade and Marketing Analysis Branch/TEID/ITP/Foreign Agricultural Service
Note: 1978-1988 Census Trade data was not available.

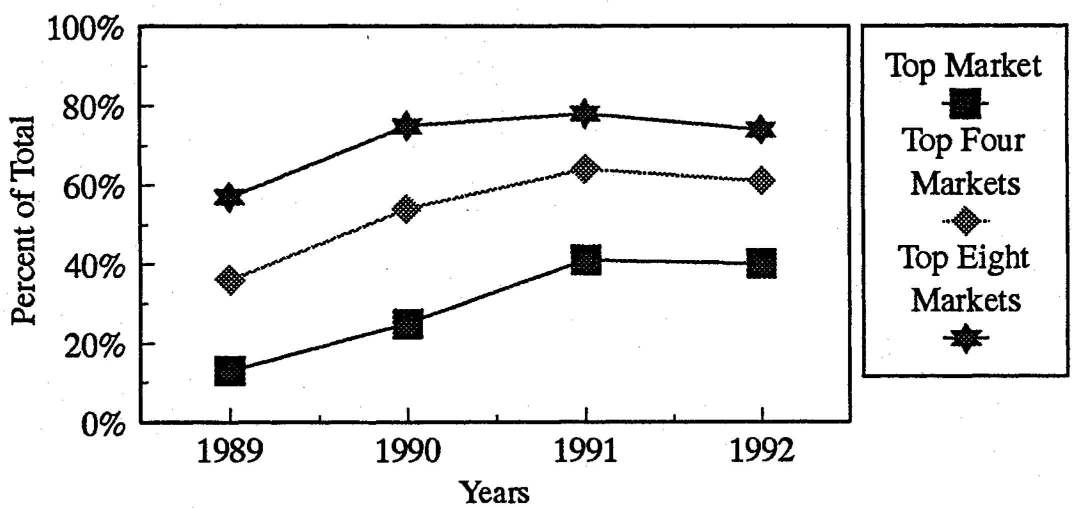

Figure 6. United States Export Concentration Ratios for Mustard Flour and Prepared Mustard, excluding Mustard Seed, 1989-1992

Source: U.S. Bureau of the Census Trade Data. Trade and Marketing Analysis Branch/TEID/ITP/Foreign Agricultural Service.

Understanding product release trends provides the basic information necessary to develop strategies for market growth. This type of information provides a mechanism for targeting segments of the market to enhance position.

Trends in consumer demographics and product release provide information on opportunities for domestic mustard market growth. Market Intelligence Services Ltd. (Market Intelligence Services 1994) was utilized to evaluate trends in domestic mustard consumption. Companies located in the United States have released a number of new product announcements at the retail level which contained mustard in 1990 to 1993 (Table 12) (Figure 7). Although 1992 had a slight decrease in new products announcements, the overall trend indicates that more products containing mustard are being released each year.

The categorical distribution of mustard in retail food products released in the United States from January, 1990, to April 15, 1994, indicates that new mustard products are broadly distributed (Table 13). As indicated, 72 percent of mustard use is concentrated in mustard (37.5 percent), salad dressing (21.39 percent), and other sauces (13.89 percent) (Table 13). In this case, mustard is defined as mustard sauces such as "hot dog" mustard. Other sauces include barbecue sauces and garnishes for various dishes. Mustard use, as a food ingredient, is increasing with potential for expansion into additional product lines.

Table 12. Number of Products, Which Contained Mustard, Released at the Retail Level in the United States, 1990-1993

Year	Number of Products Released
1990	82
1991	89
1992	70
1993	94
Total	335

Source: Market Intelligence Services (1994).

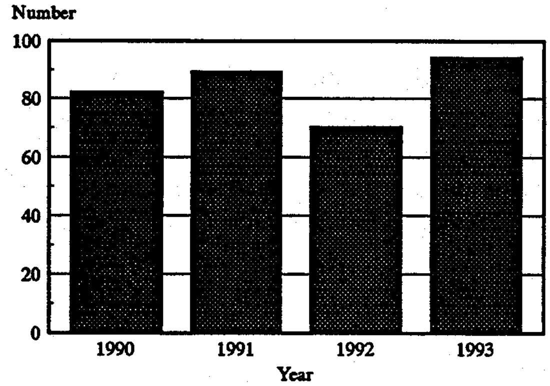

Figure 7. New Retail Product Announcements Containing Mustard, 1990-1993
Source: Market Intelligence Services (1994).

Table 13. Categorical Distribution of Mustard in Retail Food Products Released in the United States from January 1990 Through April 15, 1994

Category	Number of Products	Percent of Total
Mustard	135	37.50
Other Sauces	50	13.89
Salad Dressing	77	21.39
Spices	22	6.11
Poultry	17	4.72
Other Snacks	11	3.06
Mayonnaise	8	2.22
Meats and Entrees	6	1.67
Vegetables and Vegetable Entrees	6	1.67
Fish	5	1.39
Pickles	5	1.39
Bread Products	4	1.11
Cheese	4	1.11
Chips	2	0.56
Savory Spreads	2	0.56
Crackers	1	0.28
Margarine	1	0.28
Oil and Shortening	1	0.28
Popcorn	1	0.28
Prepared Salads	1	0.28
Soup	1	0.28
Total	360	100.00

Source: Market Intelligence Services (1994).

Results from the BMPA analysis indicate that Europe (especially the United Kingdom) could expand mustard exports from the United States to this region. To further evaluate trade lead potential in the European market, Watt and Edwardson (1992) attended the ANUGA Food Exposition in Cologne, Germany, in October 1993. The ANUGA show is held every two years in Cologne and is the world's largest international food trade show. One of the primary reasons for attending this show was to collect information about the export potential for mustard.

Mustard market research was conducted primarily by contacting exhibitors that listed mustard as one of their primary products in the ANUGA product information database. Each exhibitor contacted was scored using a number of factors developed by Watt and Edwardson (1992). An outline of the data collection and scoring system used is presented (Appendix C) (Edwardson 1994).

The large size of the ANUGA exposition made statistical sampling impossible. Therefore, the data gathered was in the form of an opportunity survey. Each company contacted was scored on the basis of the criteria outlined in Appendix C. The following comments summarize the data contained in Appendix D.

1. In many cases, it was difficult to locate the appropriate person to visit about mustard. Many companies that were listed in the mustard database on the ANUGA computer system were exhibiting other products as well. This meant that the person in charge of mustard was not always at the booth.

2. Scores were tabulated across all companies contacted, thus attempting to provide a holistic view of the mustard market.

3. Of all the companies contacted from the different countries, 65.5 percent scored well with respect to country trade status (CTSS - see Appendix C for a definition of this and other scores). Information gained regarding shipping and handling as well as other country-related infrastructure issues indicated that working within a given country posed no major obstacles.

4. The political scoring (PS) system indicated that 10.3 percent of the contacts made were located in countries where the political climate would not interfere with trade. In addition, 69 percent indicated only a fair political situation with respect to trade in a given country. Most of these issues on politics involved issues from the GATT to changes in political administrations.

5. The social score (SS) was developed to simply assess the attitude of the company being contacted. Issues from anti-American sentiment (especially in France) to consumer acceptance of U.S. products were utilized in this part of the subjective scoring system. In general, 13.8 percent and 69.0 percent of the contacts made received good to fair social scores. Germany, Belgium, and Italy received the highest scores, while France scored the lowest. The anti-American sentiment in France as well as the general attitude of the French people would make trade in this country difficult.

6. The trade lead score (TLS) was used to indicate the potential that a given company would a good trade lead. In general, 13.8 percent and 34.5 percent of the companies contacted appeared to have good to fair trade lead potential, respectively. Forty-five percent of the companies contacted indicated poor potential. Reasons for receiving a poor score for a given company typically included the following:

   a. The wrong person was in the booth and was discussing a mustard program without proper knowledge.

   b. The person in the booth indicated that the company had a good mustard supplier and was not interested in changing suppliers.

7. Obtaining physical quantity values of annual mustard use by a given company was also difficult, simply because the person in the booth did not know the answer. In only one instance was a firm answer received to this question (Appendix D, 700 mT per year). Most of the time, the question was deferred to a higher official in the company who was not at the show.

8. Most personnel at a given booth had little knowledge of the ISO-9000 requirements and their impact on mustard and related products. In nearly every case where this question was asked, the individual at the booth indicated the company had some form of in-house quality assurance department that handled this issue exclusively.

9. Canada, Hungary, France, and Germany were the main sources of mustard in the EC-12. The fact that Canada is a dominant supplier was no major surprise. However, of the companies contacted, most indicated an interest in evaluating other sources of supply, especially since the political climate in Hungary cast some doubt on its ability to supply mustard consistently.

10. Information gained through the U.S. Embassy in Bonn indicated that tariffs on mustard were not a major constraint to trade in the EC-12. In addition, the companies contacted were not aware of any tariff constraints.

Developing a list of companies that purchase value-added mustard was one of the objectives originally proposed by Watt and Edwardson (1992). A list of possible contact companies is provided (Appendix D). Many of these companies were interviewed, but were exhibiting products other than mustard and, consequently, had no knowledgeable personnel on mustard working in the booth. This was especially true of the U.K. firms, which had many displays on either retail condiments or seafood.

An informal conclusion drawn during the interview process, but not expected, was that the best prospects for improving mustard exports would be with the spice companies of Germany and Belgium. In general, the processed meat and meat selling companies were not familiar with the spices used in their work, but merely purchased the appropriate spices from the spice companies. Their selection was based on its impact on meat taste, cost, and its change in the value of their product. The mustard flour product has the potential to greatly increase the value of processed meat. The survey did not directly address this issue, but further work should provide an investigation of it.

Information on the distribution of exhibitors related to mustard by country is provided in Tables 14 and 15. This information was summarized to assist in identifying the product flow of mustard in the EC-12. Germany, France, and the United Kingdom (U.K.) represent 81.3 percent of all exhibitors with business activities in mustard (Table 14). Of these three, Germany should be considered the number one target country for additional export market development, with the U.K. as number two. France holds potential for trade, but would be difficult due to the political scores received. The contacts listed are those which received a score (Table 15). Numerous other contacts were made, but not scored due to insufficient information. This was usually due to lack of an English-speaking translator at a given booth.

Table 14. Total Number of Mustard Related Exhibitors by Country, ANUGA Trade Fair, October 1993, Cologne, Germany

Country	Number of Exhibits	Percent of Total
Austria	1	1.6
Belgium	2	3.1
Egypt	1	1.6
France	16	25.0
Germany	27	42.2
Hungary	1	1.6
Arran	1	1.6
Israel	1	1.6
Netherlands	2	3.1
Taiwan	1	1.6
United Kingdom	9	14.1
United States	2	3.1
Total	64	100.0

Table 15. Total Number of Contacts by Country, ANUGA Trade Fair, October 1993, Cologne, Germany

Country	Number of Exhibits	Percent of Total
Austria	1	3.4
Belgium	2	6.9
Egypt	1	3.4
France	3	10.3
Germany	14	48.3
Hungary	1	3.4
Arran	1	3.4
Israel	1	3.4
Italy	1	3.4
Netherlands	2	6.9
Taiwan	1	3.4
United States	1	3.4
Total	29	100.0

Even when the appropriate person was not at a given booth, contacting these various companies was worthwhile to obtain a business card and sometimes the name of another person with whom to visit. Above all, an initial contact was made to acquire basic information to enter into a computer database so that the company could be treated as a potential trade lead.

Results from the ANUGA exposition indicated that targeted education is necessary to enhance exports of Northern Plains mustard. Educational programming needs to be targeted as follows:

1. U.S. Agricultural Trade Officers (ATOs) need to be made aware of U. S. mustard products and how they can be utilized in a given market.

2. Further utilization of ATOs would be beneficial in developing a trade mission to show international firms how value added mustard can be used as a food ingredient.

3. Direct training of meat spice companies supplying spices for EC-12 countries.

Strategies for Market Growth

The Northern Plains must develop a market growth strategy to continue to enhance its position in the domestic and international mustard market. Developing a market growth strategy for mustard requires the following steps:

1. Evaluating the general characteristics of the domestic and international markets (e.g., supply and demand, economic contributions, buyers, sellers, importers, exporters, and product movement).

2. Participating in domestic and international trade shows, which allows an exhibitor to
   a. display products.
   b. visit other exhibitors who may be potential customers.
   c. evaluate trade lead potential.
   d. develop export projections.

3. Developing a targeted educational program to enhance marketing.
   a. Domestically, this involves targeting education to U.S. companies on how mustard can be utilized.
   b. Internationally, education is typically targeted to a given geographic region (e.g., Europe), then more specifically targeted to specific countries (i.e., United Kingdom.).
   c. Germany and the United Kingdom. should be the initial focal points for targeted education to increase awareness for mustard utilization.

Summary Comments and Future Research Directions

Export market development and expansion for value-added alternative crop products is an important part of agricultural diversification. Integration of market research information will assist in export enhancement and help to increase the market share for a given crop and its value-added products.

Information presented in this report indicates that potential exists to further expand exports of North Dakota mustard products. Identifying production and obtaining information on new product development and consumer demographics and trends will help to develop an export enhancement strategy for mustard products. This should strengthen North Dakota's market share of mustard.

North Dakota is a leading producer and value-added processor of mustard. Developing a holistic market research and development effort for mustard will help to enhance exports of processed mustard products. This report has significantly documented a practical methodology to assist in enhancing the position of the Northern Plains in the global mustard market. Specifically, this project has provided the following results:

1. It has provided a database of information for evaluating the domestic and international mustard markets.

2. It has provided a list of potential trade leads in the international marketplace (Appendix D).

3. It has identified the main product categories for processed mustard.

4. Current and potential barriers to export expansion have been identified as follows:
   a. Canada has a substantial share of the export market.
   b. Displacing Canadian firms from the export market will be difficult.
   c. Lack of product awareness (e.g., mustard utilization) exists, but this can be overcome with targeted education.

5. Major mustard production regions have been identified.

6. Educational programs need to be developed to enhance the acceptance and use of mustard products in the international marketplace.

7. Germany and the United Kingdom have been identified as the top countries for targeted education to increase imports of U.S. mustard, both through the ANUGA scoring system and BMPA data.

The following research projects should be implemented to further enhance the mustard market for export:

1. The trade lead scoring system described in this report should be refined. This should be a separate project which focuses on developing methodology to assist companies in obtaining information from potential customers at trade shows. Developing this type of methodology would have an impact on a number of different value-added products produced in the Northern Plains.

2. Further utilization of the World Trade Center (WTC) trade lead database needs further evaluation. Although use of this service was discussed in the proposal by Watt and Edwardson (1992), it was not feasible to execute because of funding limitations and time constraints. Evaluation of this system and its associated value to mustard exports (and other crops) will require a specific research plan.

3. Supply estimation techniques need to be further developed. Although Canada and the United States have reasonably accurate records of mustard acreage and output, this information is extremely lacking in foreign countries (Lovas 1992, Boshnakova 1993). Consequently, computerized modeling techniques should be evaluated in which environmental parameters (e.g., temperature data) are used to estimate mustard yields on a regional level. This could be conducted over a range of typical planting dates for a given region and would consequently provide an estimated yield per acre. Yields per acre could be used with long-term average production (acreage) data to estimate supply. This would provide individual companies with valuable information for managing market position.

Integrating production, processing, and market development information will provide the framework necessary to enhance the export potential for value-added mustard and, consequently, strengthen North Dakota's position in the global mustard market.

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Appendix A Uses of Yellow, Brown, and Oriental Mustard

Yellow mustard seed: The main use for yellow mustard seed is in prepared ("hot dog") mustard and is often used in pickles.

Brown mustard seed: Brown mustard seed is usually found in the hotter deli-type mustard, such as cajun-style mustard. It has a hot, pungent flavor.

Oriental mustard seed: Also a very hot and pungent mustard, oriental mustard is more oily than brown mustard and is not often used outside of mustard flour production.

General Description of Mustard Products

Mustard seed (i. e., yellow, brown, and oriental) is typically processed into three broad types of products:

1. Ground mustard, which is the whole seed ground to specific granulations.

2. Mustard flour, which has the bran removed.

3. Mustard bran, which is a by-product of mustard flour milling.

The uses of the various types of processed mustard are listed as follows:

1. Ground yellow mustard is mainly used in the meat packing industry as an aid to flavor, emulsification, water binding, slicing, and texture in hot dogs, bologna, and other processed meats. The amount of ground mustard used in these products is limited by the FDA to a maximum of 3 percent of weight in product. Ground yellow mustard has the ability to absorb excess fat and fluid (approximately 4.5 times its own weight) and is also used with seasoned hamburger, meat loaf, liver sausage, chili, and various canned meat products. The protein level ranges from 27 percent to 31 percent, and the protein is highly soluble. Ground yellow mustard is also used to prepare some table mustard.

2. Ground oriental mustard is mainly used as a low grade Chinese mustard but is also used as an ingredient by some spice blending houses for its hot, pungent flavor. It does not have the moisture absorption qualities of ground yellow mustard.

3. Ground brown mustard use is limited. It is mostly used to prepare of hot, spicy table mustard.

4. Mustard flour is considered an essential ingredient in mayonnaise, salad dressings, barbecue sauce, baked beans (e.g., pork and beans), some steak sauces, certain relishes, and many other sauces such as Hollandaise sauce and cheese sauce. It is also used in the very hot Chinese mustard sauce. Its main property is its ability to stabilize oil and water emulsions. It can absorb 1.5 times its weight of salad oil and 2 times its weight of water. It can also inhibit growth of certain molds and yeast, which extends the shelf life of certain products.

Appendix B North Dakota Mustard and Spring Wheat Budget

Appendix Table B1. Yellow Mustard Profitability Budget for North Dakota in 1993

Market Yield		12.2	
ASCS Yield		0.0	Profitability Per Acre
MARKET INCOME	Market Price:	10.930	133.35
Herbicides			5.99
Fungicides			0.00
Insecticides			0.00
Fertilizer			5.24
Crop Insurance			4.00
Fuel & Lubrication			4.95
Repairs			8.24
Drying			0.00
Miscellaneous			1.05
Operating Interest			1.43
			========
SUM OF LISTED DIRECT COSTS			34.10
Machinery Depreciation			14.22
Machinery Investment			6.16
Land Taxes			3.93
Land Investment			26.80
			========
SUM OF LISTED INDIRECT COSTS			54.61
TOTAL COST			88.71
NET RETURN			44.64
NET RETURN PER DOLLAR INVESTED			0.50
Indirect Costs			4.48
Total Costs			7.27
LABOR REQUIRED	1.0 hrs		

Source: Haugen et al. (1993).

Appendix Table B2. Spring Wheat Profitability Budget for North Dakota in 1993

Market Yield		42.5	
ASCS Yield		34.4	Profitability Per Acre
MARKET INCOME	Market Price:	3.180	135.15
Herbicides			5.39
Fungicides			1.25
Insecticides			0.00
Fertilizer			10.66
Crop Insurance			3.00
Fuel & Lubrication			5.88
Repairs			8.77
Drying			0.00
Miscellaneous			1.05
Operating Interest			1.96
			========
SUM OF LISTED DIRECT COSTS			46.79
Machinery Depreciation			15.62
Machinery Investment			7.03
Land Taxes			3.93
Land Investment			26.80
			========
SUM OF LISTED INDIRECT COSTS			57.30
TOTAL COST			104.09
NET RETURN			31.06
NET RETURN PER DOLLAR INVESTED			0.30
Cost of Setaside (-)			0.00
RETURN TO LABOR & MANAGEMENT			61.17
NET CASH FLOW			xxxxxx
Cost of Setaside (-)			0.00
RETURN TO LABOR & MANAGEMENT			66.49
NET CASH FLOW			xxxxxx
Indirect Costs			1.35
Total Costs			2.45
LABOR REQUIRED	1.2 hrs		

Source: Haugen et al. (1993).

Appendix C Survey Format Used in Trade Lead Evaluation at ANUGA

Explanation of inputs for data recording form.

1. E#: This is simply an access column for the software to use in sorting summarized data.

2. Commodity: Enter the raw commodity code as follows: a. YM - Yellow mustard.
b. OM - Oriental mustard.
c. BM - Brown mustard.
d. CS - Confection sunflowers.
e. BW - Buckwheat.
f. CO - Coriander.

3. Product: The product code is related to the commodity code as follows:
a. GM - Ground mustard.
b. MF - Mustard flour.
c. IS - In shell confection sunflowers.
d. HK - Kernel confection sunflowers (w/o hull).
e. WB - Whole buckwheat seed.
f. BF - Buckwheat flour.
g. BG - Buckwheat groats [kasha].
h. GC - Ground coriander.
i. WC - Whole coriander.

4. Company: A brief name of the company.
a. Booth: Company inquiring.
b. Floor: Company booth being visited.

5. Contact: Name of the contact person.

6. Card Ref.: This is used to assist in cataloging business cards.
A simple 1-2-3 number system on the back of a card will suffice.

7. Importer (Y/N): If the company imports a product, indicate with a Y for yes. If not, indicate with an N for no.

8. Tariffs (Y/N): Indicate with a yes or no if there are tariffs which may apply to the commodity and/or product.

9. Basic Product Line: The basic products the company handles.
Examples include
a. Salad dressings.
b. Processed meats.
c. Sauces and condiments.
d. Baked goods.
e. Healthy snacks.

10. Annual use: Indicate the annual use (in metric tons) that a given company has for a MINN-DAK product (e.g., 3 FCL/month ground mustard).

11. ISO-9000: If the company requires suppliers to be ISO-9000 certified, say "yes," otherwise say "no."

12. Country Trade Status Score: This is a subjective score used to determine the relative ease of trading in this country. The scores are as follows:
   a. 1 - Substantial trade barriers will make trade difficult.
   b. 2 - Trade barriers exist that are manageable.
   c. 3 - Relatively few trade barriers; efficient trade potential.
   d. 0 - Insufficient information obtained to score effectively.

13. Political Score: This is a subjective score used to evaluate the general political climate and its potential influence on trade. The scoring system is as follows:
   a. 1 - Volatile political climate would make trade difficult.
   b. 2 - Political climate changing, but manageable.
   c. 3 - Stable political climate to make trade efficient.
   d. 0 - Insufficient information obtained to score effectively.

14. Social Score: This is a subjective score used to evaluate the general social climate (e.g. American sentiment) and its potential influence on trade. The scoring system is as follows:
   a. 1 - Social pressures too volatile to warrant efficient trade.
   b. 2 - Social pressures somewhat difficult, but manageable.
   c. 3 - Socially stable for relatively efficient trade.
   d. 0 - Insufficient information obtained to score effectively.

15. Trade Lead Score: This is a subjective score to determine the efficiency of trade with the COMPANY itself. The scoring system is as follows:
   a. 1 - Appears to be a poor trade lead.
   b. 2 - Potential for good trade; needs follow up.
   c. 3 - Good to excellent trade potential.
   d. 0 - Insufficient information obtained to score effectively.

16. Brochure: Simply enter a "yes" if a brochure was obtained from this company and a "no" if not.

17. Source: If importing a MINN-DAK product, indicate the source of their supply [i. e., country].

Appendix D ANUGA Contact Companies

Appendix Table D1. Companies directly contacted at ANUGA with respect to mustard

E#	COMPANY	CITY	COUNTRY	PRODUCT	CONTACT	BUSINESS CARD REF. NO.	Y/N IMPORTER	Y/N or NA TARIFFS	BASIC PRODUCT LINE	(MT) ANNUAL USE	Y/N ISO-9000	CTSS	PS	SS	TLS	BROCHURE	MUSTARD SOURCE
5	Spak VSD Austria	Susice	Austria	MF	Hans Peter Spak	NA	Y	NA	Prep. Must.	NA	N	2	2	2	1	NA	Hungary
28	Conserverie & Moutarderie	Raeren	Belgium	MS, GM	Philippe Renson	10-9-8	Y	NA	Condiments	NA	N	3	2	2	2	No	Canada
20	OVI	Olen	Belgium	Proc. Meat	Johan De Groot	10-9-3	Y	NA	Hot dogs	NA	N	3	2	2	1	No	NA
15	Trade Dev. Center	Giza	Egypt	Numerous	Aly Noerat	10-10-2	Y	NA	Prep. Must.	NA	N	2	1	1	1	NA	Various
2	Covinor S. A.	Reismes	France	MF	NL	NA	Y	NA	Numerous	NA	N	0	1	1	1	NA	NA
21	European Condiments	Marannay	France	Condiments	Pascale Robert	10-9-4	Y	NA	Condiments	NA	N	1	1	1	1	No	France
27	Salaison Des Blancs	______	France	Condiments	Jean-Luc Deroanne	10-9-7	Y	NA	Condiments	NA	N	2	2	2	1	No	Canada
16	Biolabor GmbH [ORGANIC]	Bremen	Germany	MF	NL	NA	Y	NA	Prep. Must.	NA	N	3	2	2	2	Yes	Various
11	Castle Tea Co. GmbH	Hamburg	Germany	MF, GM	NL	NA	Y	NA	Numerous	NA	N	3	2	2	2	NA	Various
26	Dolling	Elmshorn	Germany	Proc. Meat	Wulf Kustner	10-10-6	Y	NA	Proc. Meats	NA	N	3	2	2	2	No	NA
25	Geschaftsfuhrer	Dresden	Germany	MF, GM	Klaus L. Peterson	10-9-5	Y	NA	Proc. Meats	NA	N	3	2	2	3	Yes	Various
22	Gundelsheim	Gundelsheim	Germany	Numerous	Hans Lindner	10-10-1	N	NA	Prep. Must.	NA	N	3	2	2	1	No	Canada
8	Karl Kuhne GmbH & Co.	Hamburg	Germany	MF, MS, GM	NL	NA	Y	NA	Numerous	NA	NA	3	3	3	3	NA	Various
14	Luise Handlmaier	Regensburg	Germany	MF, GM	NL	NA	Y	NA	Prep. Must.	NA	N	3	2	2	2	Yes	Hungary
9	Rich. Hengstenberg	Esslingen	Germany	Numerous	NL	NA	Y	NA	Numerous	NA	N	3	2	2	1	NA	Various
12	Rila [ORGANIC]	Stemwede	Germany	MF	NL	NA	Y	NA	Prep. Must.	NA	N	3	2	2	2	NA	Germany
10	Ruth Bohl GmbH	Pfaffen	Germany	MF, MS, GM	NL	NA	Y	NA	Prep. Must.	NA	N	3	2	2	1	NA	France
13	Schwabische	Gundelsheim	Germany	MF, GM	NL	NA	Y	NA	Prep. Must.	NA	N	3	2	2	2	NA	Hungary
24	Shamel	Bayern	Germany	MF, GM	Hanns-Thomas Schamel	10-10-5	Y	NA	Prep. Must.	NA	N	3	2	2	2	Yes	NA
29	Spezialitaen Partner	Bremen	Germany	Numerous	Gunther Eckhardt	10-9-9	Y	NA	Prep. Must.	NA	N	3	2	2	2	No	Various
18	Wilke	Berndorf	Germany	Proc. Meat	Burghard Barthelmie	10-9-1	Y	NA	Meat	NA	N	3	2	2	1	Yes	NA
6	Globus	Budapest	Hungary	MF	NL	NA	Y	NA	Prep. Must.	NA	N	1	1	1	0	NA	Hungary
7	Arran Provisions	Lamlash	Isle/Arran	Numerous	NL	NA	Y	NA	Numerous	NA	N	1	1	1	1	NA	Hungary
1	Osem Export (1962) Ltd.	Tel-Aviv	Israel	MF	NL	NA	Y	NA	Numerous	NA	N	0	1	2	0	NA	NA
19	Negrini Angelo	Ferrara	Italy	Proc. Meat	Carlo Negrini	10-9-2	Y	NA	Meat	NA	N	3	3	3	1	No	NA
4	Altesse Quality Food	Raeren	Netherlands	MF	NL	NA	Y	NA	Prep. Must.	NA	N	2	3	3	1	NA	Canada
3	De Marne's Fab. B.V.	Groningen	Netherlands	MF	L. L. van der Velde	10-9-6	Y	NA	Numerous	700	N	2	2	3	3	NA	France
23	Ostmann	Carlstadt	N.J., USA	Spices	Walter Seifert	10-10-3	Y	NA	Spices	NA	N	3	2	2	3	Yes	Various
17	Lee Kum Kee Co. Ltd.	Taipei	Taiwan	MF	NL	NA	Y	NA	Prep. Must.	NA	N	3	2	2	2	NA	Canada
	TOTALS:											29	29	29	29		

Note: Total Number of Mustard Companies Present: 69

COLUMN HEADING KEY:
- -CTSS: Country Trade Status Score
- -PS: Political Score
- -SS: Social Score
- -TLS: Trade Lead Score

Summarization of Scores for All Contacts	CTSS	PS	SS	TLS
-Insufficient Information ------------------>	2	0	0	2
-Poor ------------------>	3	6	5	13
-Fair ------------------>	5	20	20	10
-Good ------------------>	19	3	4	4
Percentage Summarization of Scores for All Contacts	**CTSS**	**PS**	**SS**	**TLS**
-Insufficient Information ------------------>	6.9%	0.0%	0.0%	6.9%
-Poor ------------------>	10.3%	20.7%	17.2%	44.8%
-Fair ------------------>	17.2%	69.0%	69.0%	34.5%
-Good ------------------>	65.5%	10.3%	13.8%	13.8%
	100%	100%	100%	100%

Appendix Table D2. Other companies at ANUGA that indicated an association with mustard products

Company Name	City	Country	Comments
S. A. Conservie et Moutarderie	Raeren	Belgium	Buy from France
Astra Calve	Seclin	France	–
A. l'Olivier SARL	Carros/Cedex	France	–
Bourganne Specialites	St. George	France	–
Charbonneaux Brabant SA	Reims Cedex	France	–
Crepac Comite Regional	Chalons sur Marne	France	–
Ets. Fallot	Beaune	France	–
Ets. L. Royannes Fils	Romans	France	–
Ets. L. Royannez Fils	Romans	France	–
Ets. L. Royannez Fils	Romans	France	–
Sevenday S. A.	Mulhouse	France	–
Societe Covinor Vinaigrerie	Raismes	France	–
TMV Production Alimentaire S. A.	Reims	France	–
Vilux S. A.	Ornans	France	–
Appel & Frenzel GmbH	Dusseldorf	Germany	–
Appelwarder Spezialitaten	Kuhren	Germany	–
Carl Kuhne GmbH & Co. KG	Hamburg	Germany	Stopped by (interested)
Devely GmbH	Unterhaching	Germany	–
Dunekacke & Wilms Nachf. GmbH	Hamburg	Germany	–
Epifine GmbH	Hofheim	Germany	–
Hintz Foodstuff Prod. GmbH	Bremen	Germany	–
Importhaus Wilms GmbH & Co.	Taunusstein	Germany	–
Maggi GmbH	Frankfurt	Germany	–
Nestle Deutschland AG	Frankfurt	Germany	–
Raoul Rousso GmbH	Greven	Germany	–
Rich. Hengstenberg GmbH & Co.	Esslingen	Germany	–
Segma Liebig Maille	Assnieres Cedex	Germany	–

Appendix Table D2. (Continued)

Appendix Table D2 (Continued)

Company Name	City	Country	Comments
Voss-Zobuss GmbH	Esslingen	Germany	Not very interested
Globus Konservenindustrie	Budapest	Hungary	no prices, none for sale
Lee Kum Kee Co. Ltd.	Taipei	Taiwan	Little knowledge
Dartington Foods U. K. Ltd.	Devon	U. K.	–
Hazlewood Bottling Group	Selby	U. K.	–
Hazlewood Foods PLC	Derby	U. K.	–
Lion Foods Ltd.	Chesire	U. K.	–
Pettigrews of Scotland	Oven Kelso	U. K.	–
Regency Preserve Company	Buckinghamshire	U. K.	–
Wilsons Trading Co. Ltd.	Stebbing Green	U. K.	–
Wiltshire Trading Co. Ltd.	Calme, Wilts	U. K.	–
Wolfram Berge GmbH & Co.	Numbrecht	U. K.	–
Crystal International	New Orleans	U. S. A.	–
Epifine B. V.	Maarssen	n/a	–