

# ***EOS Series***

## ***EXPORT OPPORTUNITY SURVEYS***



---

# **The Market for Organic RYE in Germany and the United States**

EOS Research Paper 2/2014

December 2014



Fachhochschule Köln  
Cologne University of Applied Sciences

Schmalenbach School of Business and Economics



# Table of Content

<b>Authors and contact persons .....</b>	<b>4</b>
<b>List of figures .....</b>	<b>5</b>
<b>List of tables .....</b>	<b>6</b>
<b>List of abbreviations .....</b>	<b>7</b>
<b>Executive summary.....</b>	<b>8</b>
<b>1. Product description .....</b>	<b>9</b>
<b>2. Production, foreign trade &amp;consumption .....</b>	<b>11</b>
Production .....	11
Foreign Trade.....	12
German and US Trade .....	14
Apparent Consumption.....	17
<b>3. Market characteristics .....</b>	<b>19</b>
Germany .....	19
The US.....	20
<b>4. Market access.....</b>	<b>23</b>
Tariffs .....	23
Standards and Regulations .....	23
Non-tariff barriers .....	24
<b>5. Prices .....</b>	<b>25</b>
Prices at Producer Level .....	25
Prices at Wholesale Level .....	26
Prices at Retail Level.....	29
Value chain .....	30
<b>6. Distribution channels.....</b>	<b>32</b>
<b>7. Commercial practices .....</b>	<b>34</b>
Germany .....	34
The US.....	34
<b>8. Packaging and labeling .....</b>	<b>36</b>
Packaging .....	36
Labeling.....	37

<b>9. Sales promotion .....</b>	<b>39</b>
Trade fairs and exhibitions.....	39
Online trade platforms .....	41
Trade magazines.....	42
<b>10. Market prospects.....</b>	<b>44</b>
Germany .....	44
The US.....	44
<b>References.....</b>	<b>47</b>

# Authors and contact persons

This market research paper has been prepared under the supervision of Prof. Dr. Wolfgang Veit of Cologne University of Applied Sciences and Prof. Dr. Carol Scovotti of University of Wisconsin-Whitewater in the course of the inter-university cross-border collaboration student research project “Export Opportunity Surveys (EOS)”. The respective authors are responsible for the content of their own texts.

## ***Authors***

Neriman Kocacal, Cologne University of Applied Sciences

Marilyn Parise, University of Wisconsin-Whitewater

Nina Sips, Cologne University of Applied Sciences

Sarah Stepanek, University of Wisconsin-Whitewater

Melanie Werner, Cologne University of Applied Sciences

Christa Zimmerman, University of Wisconsin-Whitewater

## ***Contact persons***

Prof. Dr. Wolfgang Veit

Cologne University of Applied Sciences

Schmalenbach School of Business and Economics

Phone: +49 221 8275 3420

E-Mail: wolfgang.veit@fh-koeln.de

Prof. Dr. Carol Scovotti

University of Wisconsin-Whitewater

Department of Marketing

Phone: +1 262 472 5469

E-Mail: scovottc@uww.edu

# List of figures

Figure 1: Countries Export Value Shares 2013 .....	13
Figure 2: Countries Import Value Shares 2013 .....	14
Figure 3: Difference in Producer Prices in Germany - Conventional and Organic Rye .	26
Figure 4: Market Price Development 2009 - 2004 in Germany .....	27
Figure 5: Price Development at German Wholesale Level between Bread Rye and Feed Rye .....	28
Figure 6: Consumer Price Development of Rye and Mixed Grains Bread in Germany from 2000 - 2013 .....	30
Figure 7: Value Chain - Grain Trade .....	31
Figure 8: Supply Chain.....	32

# List of tables

Table1: Top Rye Producers and Production Levels .....	11
Table 2: Annual Producer Prices for Rye .....	12
Table 3: Countries Export Value and Export Quantity of Rye.....	12
Table 4: Countries Import Value and Quantity of Rye .....	13
Table 5: Germany's Main Import Partners and Import Values.....	15
Table 6: Germany's Main Export Partners and Export Values .....	15
Table 7: US's Main Import Partners and Import Values .....	16
Table 8: US's Main Export Partners and Export Values .....	16
Table 9: Rye Consumption Level in US.....	17
Table 10: Rye Consumption Level in Germany .....	18
Table 11: Historical cost per bushel to produce Organic Rye in US .....	28
Table 12: Price Development at Value Chain for Bread Rye in 2014.....	31
Table 13: Market Prospect Summary .....	45

# List of abbreviations

Avg.	average
B	billion
CBI	Centrum Bevordering Import (Netherlands)
CFR	Code of Federal Regulations
CIF	Cost Insurance Freight
EU	European Union
€	Euro
FAO	Food and Agricultural Organization
FDA	Food and Drug Administration
FOB	Free on board
HS	Harmonized Commodity Description and Coding System
kg	kilogram
m	million
MFN	Most Favored Nation
MT	metric ton
No.	Number
SITC	Standard International Trade Classification
SPS	Sanitary and phyto-sanitary
US	United States
US\$	US Dollar
USDA	US Department of Agriculture
WTO	World Trade Organization

# Executive summary

This Export Opportunity Survey examines the markets for organic rye in both the United States (US) and Germany. While rye can be used for many purposes, including baking, distilling and feeding livestock, rye grains are primarily used as either flour for bread or for the production of alcohol, including whiskey and beer.

Rye grain grows best in areas with cold winters, dry summers and is primarily cultivated as a winter crop.

Germany is the largest importer and producer of rye in the world, importing over 24% and producing 28% of the world's rye. The US imports the second largest amount of rye, at 15%, but falls to 10<sup>th</sup> place for world-wide production. It is estimated that consumption in the US has grown significantly within the last five years, increasing by 46% since 2009. Rye is gaining popularity in the US and its demand is expected to increase due to increasing demand in organic products. Interestingly, the US consumes 129% of their current production, which causes significant need to import rye to the US. Rye consumption in Germany also appears to be increasing with an estimated 14% increase since 2009.

There was no import duty on rye until 2014, when the EU placed an import due of € 10.44 per MT. The EU tries to limit the entry of lower priced grains through duties and quotas, however, due to the rye partnership that exists between the US and Germany, the two countries calculate this import tariff differently than with other countries.

Organic rye pricing is significantly influenced by the intended consumption of the product. These producer level categories include feed rye (animal feed), bread rye (bread-making rye) and energy rye. At the wholesale level, prices are mostly determined at German regional grain exchanges, while the US sells its rye to customers at whatever price the market allows. At the retail level, in both the US and Germany, organic rye, including rye berries, flour and grain are sold to consumers within retail stores.



# 1. Product description

This Export Opportunity Survey covers the market for organic rye in the US and Germany. Organic Rye is classified under the following codes:

- HS: 100200 Rye;
- SITC: 045.1 Cereals, unmilled (other than wheat, rice, barley and maize);
- ISIC: C1061 Grain milling: production of flour, groats, meal or pellets of wheat, rye, oats, maize (corn) or other cereal grains.



It should be noted that while commodities such as wheat, rice and corn have been given organic HS codes, organic rye still has not yet received an HS code (USDA 2011).

**Rye** is an erect annual grass that can grow to a height of 1 to 2 m (4-6 feet), and is composed of flat blades and long spikes (Encyclopedia Britannica 2014). The spikes, called spikelets, contain the florets, where one-seeded grains are developed (USDA 2002). Grains are considered relatively large (0.3-0.5 inches long) and their color may change between light brown to dark gray. Rye grows best in areas with cold winters and dry summers. Rye is mainly cultivated as a winter crop where climate and soil are unfavorable to grow other cereals (Encyclopedia Britannica 2014). It can withstand dry conditions with minimal annual rainfall. This is due to its highly developed root system that can survive with minimal water. The structure of the rye plant allows it to capture and hold a protective snow cover so it can

stand cold temperatures and most severe climates (University of California: Division of Agriculture and Natural Resources 2014).

The origin of rye, known as the *Secale cereale* specie, is unknown. It is believed to have originated from a wild rye found either in southwestern Asia or in the location of Syria, Armenia and Iran; migrated west through the Balkan Peninsula or over Europe (Bushuk 2001). Today, the broad area of production includes northern, eastern and central Europe as well as Asia and North America. The main producers of rye grain are Germany, Russia, and Poland.

The main type of rye is the *winter rye*, also known as *fall rye*. This type is planted in autumn, usually in September. When it is planted in autumn, it needs to pass the winter and be harvested in the summer of the same year (Northern Grain Growers 2011). Fall rye is ready to harvest before other cereals such as winter wheat and barley (Alberta - Agriculture and Rural Development 2011). The crop is harvested as soon as its grain is hard and dry. A combine harvester - a complex piece of farm equipment that both cuts and threshes, or separates the seed from the plant - is used to harvest rye (Encyclopedia Britannica 2014). Since rye seeds thresh very easily, the harvesters must be careful in picking up the swath (the rows of cut rye

left by the combines) to avoid shattering. When grains are separated, the hull must also be removed.

After the rye harvest, winter rye can be processed into many forms, including rye berries, cracked rye or rye chops, rye flakes and rye flour. Rye berries are whole rye kernels, while cracked rye or rye chops describe cracked or cut up rye berries. These pieces are easier to prepare than the completely intact rye berry, which some people prepare and eat like oatmeal. Rye flakes are created by steaming the berries, rolling and then drying them. The flakes look like rolled oats (Whole Grains Council 2013). Rye can be used for industrial purposes such as baking, distilling and milling as well as feeding livestock. Mainly, its grains are used as flour for bread and for the production of alcoholic beverages such as whiskey and beer (Bushuk 2001).

Rye bread and rye based foods are gaining popularity because consumers are increasingly interested in healthy and balanced diets. Rye is often mentioned in relation to healthy nutrition because of its nutrients. Rye is very rich in carbohydrates and provides a good source of fiber and antioxidants, known to reduce the risks associated with diabetes, cardiovascular diseases and certain cancers. It has high amounts of phosphorous, magnesium and small quantities of vitamins including copper and pantothenic acid as well lignan phytonutrients, which are beneficial hormone-like compounds (The World's Healthiest Foods 2014).

## 2. Production, foreign trade & consumption

### Production

During mid-1990s, the importance of rye production started to decline due to the increase of other major crops such as wheat, rice and maize. Table 1 provides an overview of the top rye producers in the world from 2008 to 2013, and the percentage share in global production. Rye is a particularly important crop in Germany, Russia and Poland. Around 68% of the world's rye is grown in these three countries. In Germany, due to unfavorable weather conditions, the yield was low in 2010 and 2011 (Schaack et al. 2011).

Note: International databases such as the UN Comtrade, FAOSTAT and Trade Map do not distinguish between organic rye and non-organic rye. As a result of the lack of data on organic rye production, the following data relates to rye in general (with no distinction between organic and non-organic rye).

Rank	Countries	1995	2008	2009	2010	2011	2012	2013	Share in Global Production in Year 2013
1	World	22,610	18,128	18,294	11,961	13,016	14,616	16,697	
2	Germany	4,533	3,744	4,329	2,904	2,521	3,893	4,689	28,1%
3	Russia	4,098	4,505	4,333	1,636	2,971	2,132	3,360	20,1%
4	Poland	6,288	3,449	3,713	2,852	2,601	2,888	3,359	20,1%
5	China	600	645	630	570	680	678	650	3,9%
6	Ukraine	1,280	1,051	954	465	579	677	638	3,8%
7	Denmark	518	152	238	255	294	384	527	3,2%
8	Turkey	240	247	343	366	366	370	365	2,2%
9	Canada	294	316	281	232	195	337	208	1,2%
10	US	252	203	178	189	161	176	195	1,2%

Source: Euromonitor International, 2014. Countries and Consumers Annual Data: Production of Rye

Note: Historical Data of 1995 production is retrieved from Cereals Food World: Rye Production and Uses Worldwide, 2001.

Table 2 shows the annual producer prices for rye between 2010 and 2012. Annual producer prices in Russia, Ukraine, Denmark, Turkey and Canada increased each year. In 2012, producer price was highest in China with US\$ 692 per MT followed by US with US\$ 303/MT.

Table 2: Annual Producer Prices for Rye (US\$/MT)					
Rank	Countries	2010 Annual Producer price (US\$/MT)	2011 Annual Producer price (US\$/MT)	2012 Annual Producer price (US\$/MT)	Net Production Value for 2012
1	Germany	170	281	260	277
2	Russia	112	134	147	144
3	Poland	140	253	229	226
4	China	-	168	692	15
5	Ukraine	100	161	165	54
6	Denmark	166	239	256	35
7	Turkey	253	268	279	32
8	Canada	155	218	236	27
9	US	198	305	303	3
Net production value is in 1,000,000 US\$					
Source: FAOSTAT					

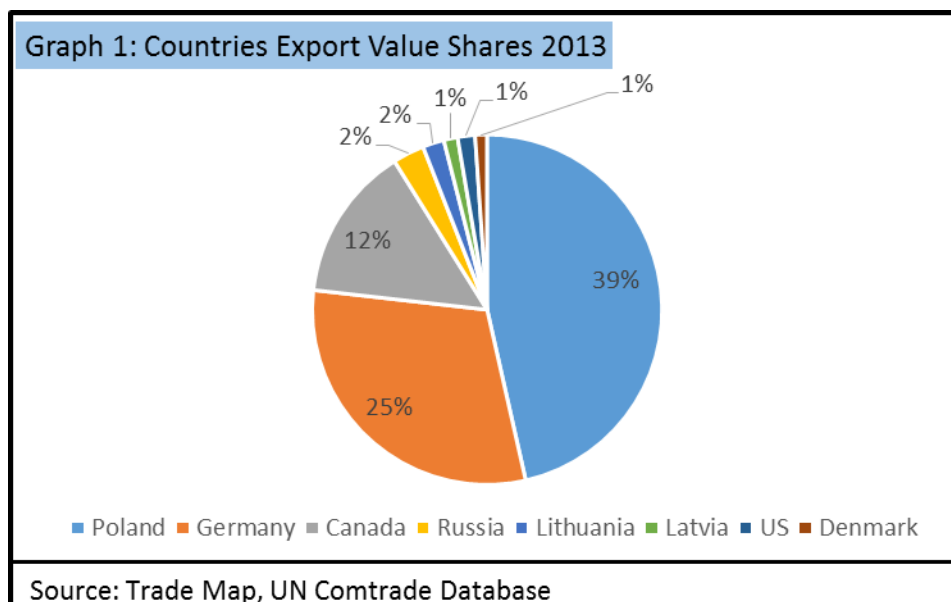
## Foreign Trade

### World Exports

Table 3 shows the export value and export quantity of rye from different countries. Europe stands as the major exporter of rye to the world. In 2013, Poland had the highest export value of US\$ 191m, followed by Germany with the export value of US\$ 125m. In 2013 trade value per kilogram was highest in the US with US\$ 0.94.

Table 3: Countries Export Value (1,000,000 US\$) and Export Quantity of Rye (1,000 MTs)															
Countries	2009			2010			2011			2012			2013		
	Quantity	Price Value (per kg)	Price (per kg)	Quantity	Price Value (per kg)	Price (per kg)	Quantity	Price Value (per kg)	Price (per kg)	Quantity	Price Value (per kg)	Price (per kg)	Quantity	Price Value (per kg)	Price (per kg)
Poland	589	81,8	0,14	391	63,3	0,16	97	27,5	0,28	287	76,8	0,27	894	191,2	0,21
Germany	465	88,6	0,19	355	65,3	0,18	225	74,1	0,33	211	69,1	0,33	426	124,9	0,29
Canada	100	26,4	0,26	160	34,9	0,22	200	57,7	0,29	167	53,8	0,32	161	58,9	0,37
Russia	8	1,1	0,13	9	0,7	0,08	85	17,1	0,20	281	61,2	0,22	49	12,0	0,24
Lithuania	118	18,5	0,16	21	3,8	0,18	28	7,9	0,28	80	22,2	0,28	30	8,2	0,27
Latvia	73	12,8	0,18	35	5,5	0,16	25	6,7	0,27	112	31,7	0,28	24	5,3	0,22
US	4	0,3	0,09	4	2,0	0,50	4	3,3	0,83	7	6,3	0,90	7	6,6	0,94
Denmark	25	10,3	0,41	62	18,0	0,29	102	33,7	0,33	39	12,7	0,33	6	4,5	0,76
Source: Trade Map, UN Comtrade Database															

In 2013, the total worldwide value of exported rye was US\$ 493m. Poland had the highest exported value at US\$ 191m making up 39% of total rye exports.



### World Imports

Table 4 shows the import value and import quantity of rye from different countries. In 2013, Germany had the highest imported value of US\$ 121m, followed by Netherlands with an import value of US\$ 80m.

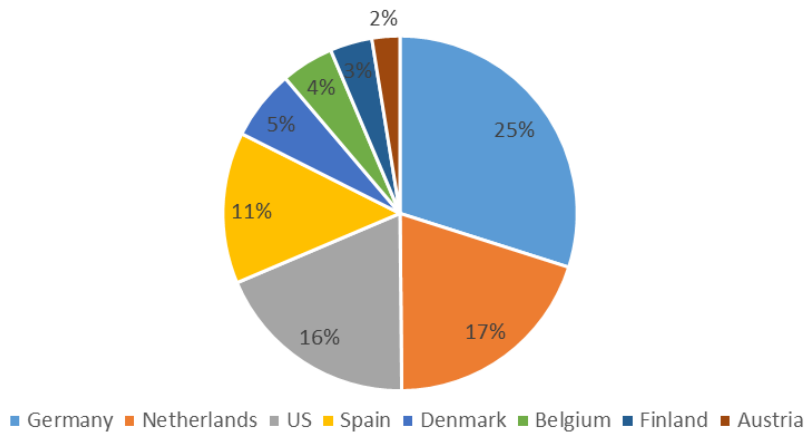
**Table 4: Countries Import Value (1,000,000 US\$) and Quantity of Rye (1,000 MTs)**

Countries	2009			2010			2011			2012			2013		
	Quantity	Value	Price (per kg)	Quantity	Value	Price (per kg)	Quantity	Value	Price (per kg)	Quantity	Value	Price (per kg)	Quantity	Value	Price (per kg)
Germany	354	54,6	0,15	322	55,6	0,17	267	81,2	0,30	360	102	0,28	519	121	0,23
Netherlands	166	61,4	0,37	211	33,6	0,16	136	36,3	0,27	237	65	0,27	293	80	0,27
US	120	28,3	0,24	120	25,4	0,21	171	46,2	0,27	179	53	0,30	235	76	0,32
Spain	415	73,5	0,18	140	23,7	0,17	11	3,3	0,30	190	55	0,29	209	56	0,27
Denmark	39	9,2	0,24	14	4,8	0,34	9	4,0	0,42	19	7	0,37	90	26	0,29
Belgium	56	8,9	0,16	27	4,1	0,15	11	3,5	0,31	18	6	0,33	76	20	0,26
Finland	60	10,6	0,18	44	8,9	0,20	38	11,9	0,31	51	16	0,31	56	16	0,29
Austria	59	10,6	0,18	56	12,0	0,21	35	11,4	0,33	36	12	0,33	41	11	0,27

Source: Trade Map, UN Comtrade Database

The US imported the third largest amount (in dollars), at US\$ 76m or 16% of total rye imports.

Graph 2: Countries Import Value Shares 2013



Source: Trade Map, UN Comtrade Database

## German and US Trade

### Germany

#### *Imports*

Total import value of rye in Germany increased significantly between 2009 and 2013, from US\$ 54,6m to US\$ 121m. The major supplier of rye to Germany is Poland. In 2013, Germany imported US\$ 99,2m of rye from Poland.

Table 5: Germany's Main Import Partners and Import Values (1,000,000 US\$)					
Countries	2009	2010	2011	2012	2013
Poland	36,6	37,4	28,4	44,5	99,2
France	2,8	3,4	6,7	7,2	6,7
Czech Rep.	2,6	3,8	5,1	3,0	6,6
Austria	2,6	2,1	3,0	3,8	2,2
Netherlands	5,1	3,2	4,4	0,9	1,9
Denmark	0,5	2,4	15,7	6,5	1,0
Latvia	2,1	1,3	0,9	13,7	0,0
<b>Total Import Value</b>	54,6	55,5	81,1	102,0	121,0

Source: UN Comtrade Database

### Exports

In 2013, Germany exported total value of US\$ 124,8m of rye to the world. Germany's main export partner is the Netherlands. Total trade value of US\$ 51,6m of rye had been exported to the Netherlands in 2013.

Table 6: Germany's Main Export Partners and Export Values (1,000,000 US\$)					
Countries	2009	2010	2011	2012	2013
Netherlands	29,1	25,1	24,5	27,2	51,6
US	8,7	1,8	-	6,6	16,5
Poland	1,6	0,6	6,4	4,2	12,6
Japan	3,4	7,3	2,1	5,7	8,0
Belgium	4,5	2,0	2,3	1,9	6,3
Denmark	4,6	4,2	5,4	3,0	3,3
Austria	2,4	3,4	5,1	4,1	3,1
<b>Total Export Value</b>	88,6	65,2	74,0	69,1	124,8

Source: UN Comtrade Database

## The US

### Imports

The largest supplier of rye to the US in 2013 was Canada, with a total trade value of US\$ 52m. Behind Canada, was Germany at US\$ 18,6m and both Poland and Sweden at roughly US\$ 2,3m each.

While Canada and Germany have been long-term import partners to the US, countries like Poland and Sweden have recently become trade partners.

Table 7: US's Main Import Partners and Import Values (1,000,000 US\$)					
Countries	2009	2010	2011	2012	2013
Canada	17,3	25,3	36,8	45,9	52,6
Germany	10,9	-	2,4	7,0	18,6
Poland	-	-	-	-	2,3
Sweden	-	-	-	-	2,3
Denmark	-	0	6,7	-	-
<b>Total Import Value</b>	28,2	25,3	46,1	52,9	76,1

Source: Trade Map

### Exports

The US exports the majority of its rye to the Republic of Korea. As the chart below highlights, trade values into Korea increased by 60% from 2011 to 2012.

Table 8: US's Main Export Partners and Export Values (1,000,000 US\$)					
Countries	2009	2010	2011	2012	2013
Rep. of Korea		1,4	2,4	5,5	6,3
Japan	0,2	0,4	0,6	0,5	0,1
Mexico	-	-	0,1	0,1	0,1
South Africa	-	-	-	-	0,1
Canada	0,1	0,0	0,0	0,1	0,0
<b>Total Export Value</b>	0,3	1,9	3,3	6,3	6,6

Source: Trade Map



The US is a bigger importer of rye than an exporter. In 2013, US imported a value of over US\$ 76m, whereas the exports were valued at US\$ 6.6m.

In summary, Germany and the US have both experienced significant upward trends in imports, exports and pricings. Germany's total import value has been increasing over the last 5 years, from US\$ 54.6m in 2009 to US\$ 121m in 2013 while the US increased from US\$ 28.3m in 2009 to US\$ 76.1m in 2013. From an export standpoint, Germany's total export value in 2010 was US\$ 65.3 m, and in 4 years has grown to US\$ 124.9m, a 91.27% increase. Finally, from a pricing standpoint, Germany and the US's import prices per kilogram in 2013 were relatively similar, at US\$ 0.23 and US\$ 0.32 respectively. Germany's export price per kilogram increased from US\$ 0.19/kg in 2009 to US\$ 0.29/kg in 2013, while the US's price was significantly higher at US\$ 1,01/kg in 2013. The US's export price in 2013 is roughly 50% higher than it was in 2010.

## Apparent Consumption

The estimated yearly consumption of both countries is equal to their total production plus imports minus exports. The two tables below provide the estimated total consumption from 2009 to 2013 for both Germany and the US. This calculation was used, as primary consumption data could not be found.

Table 9: Rye Consumption Level in US (in millions)					
US	2009	2010	2011	2012	2013
Total Production (kg)	161	171	146	160	177
Imports (kg)	120	120	171	179	235
Exports (kg)	3,9	3,9	4,0	7,2	6,5
Est. Consumption (kg)	277	288	313	332	405
Per Capita Consumption in US (kg)	0,8	0,9	0,9	1,0	1,2
Source: UN Comtrade Database, Euromonitor International, 2014. Countries and Consumers Annual Data: Production of Rye					

Table 10: Rye Consumption Level in Germany (in millions)					
GERMANY					
	2009	2010	2011	2012	2013
Total Production (kg)	3,926	2,634	2,287	3,531	4,253
Imports (kg)	353	322	267	360	519
Exports (kg)	465	355	225	211	426
Est. Total Consumption(kg)	3,815	2,601	2,329	3,681	4,347
Per Capita Consumption in Germany (kg)	47	32	28	45	53

Source: UN Comtrade Database, Euromonitor International, 2014. Countries and Consumers Annual Data: Production of Rye

As the information above illustrates, the estimated consumption in US is nearly twice its imports, with an increase of 46% since 2009. Regarding Germany, its estimated total consumption is fairly similar to its total country production. Germany's rye consumption has also been increasing since 2009 with an estimated 14% increase. The table shows that Germany is a major consumer of rye, compared to the US. Although rye appears to be gaining popularity in the US, per capita, Germany's consumption rates are significantly higher. It should be mentioned however that the consumption rates provided refer to the use by final consumers of rye. In other words, rye may still be exported in the form of bread, to other countries. This is significant to address, as the data provided does not include processed rye.

# 3. Market characteristics

## Germany

### *Preferences*

For the German consumer, quality and origin of a product are very important. For almost half of the customers, food quality is “highly important”. Overall the demand for fair-trade and organic products has been rising, making Germany the second largest market for organic products (Global Agricultural Information Network 2014). German consumers as well as German mills prefer local rye because a long supply chains increase the risk of violating organic standards (Meyermühle 2014).

### *Market Segments*

The German rye market can be divided into three segments:

- German bread market
- bioenergy production
- animal feed (Ryebelt 2014)

The importance of rye as animal feed is rising, but it still plays a minor part in Germany compared to other grains/products (Meyer et al. 2012). More than half of the rye yield in Germany is used for animal feed (Roggenforum 2006).

Compared to the relative small percentage in world consumption Germany’s rye consumption is at a very high percentage, because rye flour is the basis for bread in Germany. Consumption in Germany was at 8,8kg/capita in 2012 which makes up 13% of overall bread consumption (Ryebelt 2014). A study conducted by “Vereinigung Getreide-, Markt- und Ernährungsforschung GmbH” found out that rye bread is mostly preferred by middle and older age groups. German consumers choose rye mostly because of the rich taste but increasingly because of its health benefits and because of ethical and environmental reasons. (GMF Vereinigung Getreide-, Markt- und Ernährungsforschung 2004). Consumers choose organic products to reduce risks for their own health and for the environment (OECD 2002).

Germany was one of the first countries to consider and produce biofuel. The European Biodiesel Board estimated that in 2012 Germany was the biggest producer of biofuel in Europe. (European Biodiesel Board, 2014). Rye is increasingly used as a renewable source for bioenergy (Roggenforume.V. 2006). In 2007, 25% of Germany’s rye harvest was used for bioenergy production (Julius Kühn-Institut 2010).

### ***Conditions of Acceptance***

German buyers emphasize the quality of rye. Quality is especially important for the bread industry since low quality ingredients will have an impact on the final product. There are several quality indicators that should be fulfilled. The consumer demands a product of steady characteristics like color and taste.

Eighty-seven percent of Germans say that the most important reason to buy organic food is to support regional producers and 92% prefer local products (BÖLW 2014). However, price is not a crucial factor. For constant consumers of organic food, price is not a barrier to purchase (BÖLW 2010).

### ***Competition***

Rye has a small part in the overall cereal production. Wheat is the top competitor representing almost 50% of overall cereal production in the EU and Germany (World Grain, 2011). Other important competitors include barley and corn (European Commission 2014). Companies looking to export to Germany have to compete with local and regional farmers. (Ryebelt, 2014(b)). Germany imports organic crop when the domestic harvest is too small to satisfy consumers' demand. The higher the German yield the less is imported because German rye is preferred to foreign crop (Schaack et al. 2011). But due to the high consumption of rye, Germany remains the biggest rye importer (see Chapter 2). Regarding bioenergy production rapeseed and corn are the biggest competitors. In 2011, rapeseed represented around 40% of all energy crops produced in Germany (Bauernverband 2012).

### ***Demand Trends***

According to the International Trade Centre, the value in exported rye from Germany took slight hits in 2010 and 2012 which was due to poor yields. But overall Germany is one of the top exporters with one of the highest exported value of rye in 2013. The value of imported rye increased throughout 2009 to 2013 (ITC 2014). The European Commission predicts that the overall demand of cereals will be stable with production experiencing modest growth (European Commission 2014). Income and price elasticity for agricultural products is low in the long term. The demand only faintly reacts to price changes throughout the year (Wirtschaftslexikon 24 n.d.). This applies to rye as well.

## **The US**

### ***Preferences***

The US market for organic food is customer driven. The US organic food market has grown US\$ 31.5 billion in sales, which means a growth of 9.5% in 2011. There is still a large market to gain with only 4.2% of food sales in the US being organic varieties (Organic Trade Association 2012).

The consumer perceives organic products as healthier and safer than conventional varieties. The health and safety perception of organic products are key to why consumers are willing to

pay a premium price for the product. (Yiridoe, E., Bonti-Ankomah, S., Martin, R. 2005). The end consumer is typically an individual who buys products made from rye such as breads and whiskey. The typical consumer of organic rye products in the US is young and well-educated adults ages 25 to 34 years (Silva et al. 2012). These consumers value a healthier lifestyle.

### ***Market Segments***

Two main business market segments for rye can be identified for the US market:

- US food market-bakery and bread factories
- By-products such as alcoholic beverages and ethanol (Fuller 2004)

Customers for organic rye in the US are bakeries and bread factories. Consumers are trending more to whole grain breads for the health benefits (Food Navigator 2012). For a bread to be advertised as “whole grain” in Germany it has to consist of at least 90% of whole grain rye (Bioland 2013). In the US bread is considered as being “whole grain” with just around 25% of whole grain (AACC International 2013).

Another customer of organic rye is distilleries that use rye to produce distilled alcohol for liquor products. In the last few years the US saw an increase of rye whiskey production. Rye whiskey must consist of at least 51% of rye grain whereas normal bourbon contains at least 51% of corn.

Additional markets for organic rye include distillers’ grain and ethanol. Distillers’ grain has increased from estimated 3m MT in 2000 to 35m MT in 2012. Distiller grains exports have also increased from estimated 1m in 2000 to over 7.5m in 2011 (RFA, 2012). As mentioned earlier an additional by-product of rye is ethanol but in the US it is mainly produced from corn.

### ***Competition***

The main competitors of organic rye in the US are corn, soybean, and wheat. Corn is mainly used in animal feed, human consumption, and its by-product is used for ethanol production. The US produces and consumes over 30% of the world production and consumption of corn (USDA 2014). Soybean is a tough competitor for field space because it is also a main ingredient in animal feed. Wheat is another competitor since the US is a major producer and exporter of this product (USDA 2012).

Foreign producers are important players in competition. Canada would be a competitor for both the US and Germany. Rye is one of Canada’s major export goods to the US, Europe, and Japan (Biomanantial 2014).

Resellers are players in competition as well. Resellers include natural food retailers, which are typically specialty stores. They accounted for 39% of total organic food sales in 2010 (Silva et al. 2012).

### ***Demand Trends***

The demand trend is increasing every year. Total production, exports and consumption level of rye has been increasing from 2009 to 2013 in the US. Rye consumption level doubles the production level. The US produces 1.2% of the total world production (See Table 1). For the year 2014/2015 it is expected that the US will improve their rye production levels from 177m kg to 213m kg and consumption level will increase from 405m kg to 432m kg.

The price elasticity for organic rye in the US is low. There is an increase in consumption of 46% and increase in price of 60%. This gives a price elasticity of +0.77 which means an increase in price would not impact demand negatively.

## 4. Market access

### Tariffs

The EU has import bound duties for all cereals under “The General Agreement on Tariffs and Trade” (GATT). However, for some cereals the rates applied are different. Since October 19th 2010, import duty for rye has been set at 0€/MT. In July 2014, the European Commission has announced that import duty on rye is set at 5.32€/MT (US\$ 6.62/MT) (European Commission Press Release Database 2014). However after two months, on 18 September 2014, the European Commission issued Regulation No. 984/2014, increasing the import duties on maize, sorghum and rye from EUR 5.32€/MT to EUR 10.44€/MT (US\$ 13.01/MT) (Global Trade Alert 2014). This decision was based on the low global feed grain prices (HGCA 2014).

Due to the 2014 Normal Trade Relations (NTR), which was formerly known as the Most Favored Nation (MFN), the US holds a duty rate of US\$ 0 on rye. This holds a binding status through the World Trade Organization. For small number of countries that are not included in the NTR, the US applies a rate of US\$ 0.59 per kg.

The US has 14 Free Trade Agreements enforced within 20 different countries, called Partner Countries. In addition to the FTA, the US is included in many different agreements aimed to lower or eliminate tariffs. The CAFTA-DR (Central American/Dominican Republic FTA) for example, is an agreement that allows free trade to essentially all of Central America.

### Standards and Regulations

All member states of the EU (EU), including Germany, form a customs territory (the European Customs Union) where unified customs arrangements apply. Goods imported into the EU are subject to EU-wide import regulations, customs tariffs and customs procedures (NRW.Invest Germany 2014). Regulation (EC) No 834/2007 defines all stages for production, distribution, inspection, and labeling (such as "Bio", ecological, or organic) of organic products that may be marketed and traded within the EU. Goods that fall within this regulation number and which are imported from non-EU countries may only be released for free circulation after the presentation of the original inspection certificate (German Customs Administration 2014).

In Germany, the Federal States are responsible for supervising whether grains meet the requirements for import. Also, special monitoring procedures are in place for agricultural goods from non-EU countries to protect the health of consumers. These measures require, for example for grains such as rye, special food legislation documents such as a common entry document to be submitted to the customs offices. At the national level, the Federal Ministry of Food and Agriculture is responsible for food and feed legislation (German Customs Administration 2014).

The US import requirements include regulation by the Custom and Border Protection and the United States Department of Agriculture. Both organizations are responsible to protect the US producers and suppliers. The requirements for importing grains into the US are:

- Documentation including Entry Manifest or application and special permit for immediate delivery, evident of right to make entry, and commercial or pro forma invoice
- Examination of goods by customs will take place to be sure it matches the invoice and meets all requirements
- Evidence of bond posted to cover potential duties, taxes, and additional charges
- Comply with all provision related to the organic rye
  - This includes a permit/license for import of organic rye (USDA APHIS 2014)
- Upon arrival, the FDA has a right to inspection. The product must be in good condition and free of invasive fungus and or pests that would be potential problem for homeland crops (CBP 2006)

## **Non-tariff barriers**

Non-tariff barriers can include measures such as sanitary and phytosanitary requirements, and technical barriers. In Germany, the official Plant Protection Services of the Federal States are in charge of the execution of federal laws, orders, and the application of the phytosanitary measures. They are responsible for inspections of plants and plant products for import, export as well as in production and trade within the EU (Julius Kühn-Institut 2014).

In the US, a document confirming that plants and plant products, that are about to be imported, have been inspected according to appropriate procedures, are free from quarantine or injurious pests, and are conforming with the current phytosanitary regulations of the importing country. This document is required for customs clearance and market access and it has to be issued by the appropriate plant health authorities of the country of origin. The US phytosanitary authorities accept phytosanitary certificates issued by a competent authority of any EU member state if all relevant information is provided (Market Access Database 2014).



## 5. Prices

Rye is usually cheaper than wheat or other grains on the market. Price development is very volatile due to differences between forecasted yield and actual harvested yield. In addition, price development is dependent on trends for other grains, especially wheat and corn (Ryebelt 2014). Also, organic rye receives a premium price from customers because of the added value.

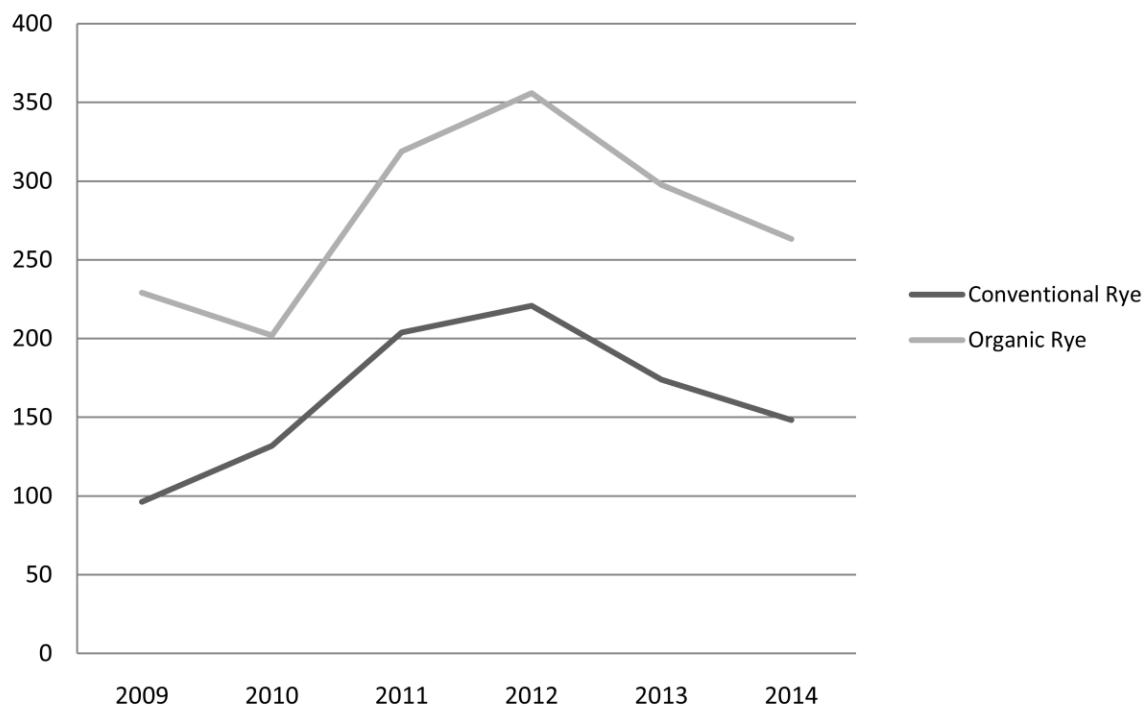
### Prices at Producer Level

#### *Germany*

For organic rye there are different levels of pricing. Feed rye - rye used for animal feed, bread rye - rye used for bread making and energy rye all record different price developments (Ryebelt 2014). German producers of organic rye receive public funding for ecological and economic reasons. Ecological agriculture also means more work for production and cultivation. Choosing to produce organic products results in higher prices compared to non-organic products (Ökolandbau 2014). German prices also depend on the quality and fulfillment of certain contract agreements. Deductions from the price are possible if certain requirements are not fulfilled (Proplanta 2014).

Prices of organic rye experienced high volatility in each year between 2009 and 2014 in Germany. Figure 1 shows average producer prices. These prices were rising until 2012 where they peaked at around 350€/MT. After 2012 prices decreased largely due to higher yield in 2013. The price difference between conventional and organic rye between 2009 and 2014 displayed in Figure 1 indicates the average markup from conventional to organic being around 115€/MT.

Graph 3: Difference in Producer Prices in Germany - Conventional and Organic Rye



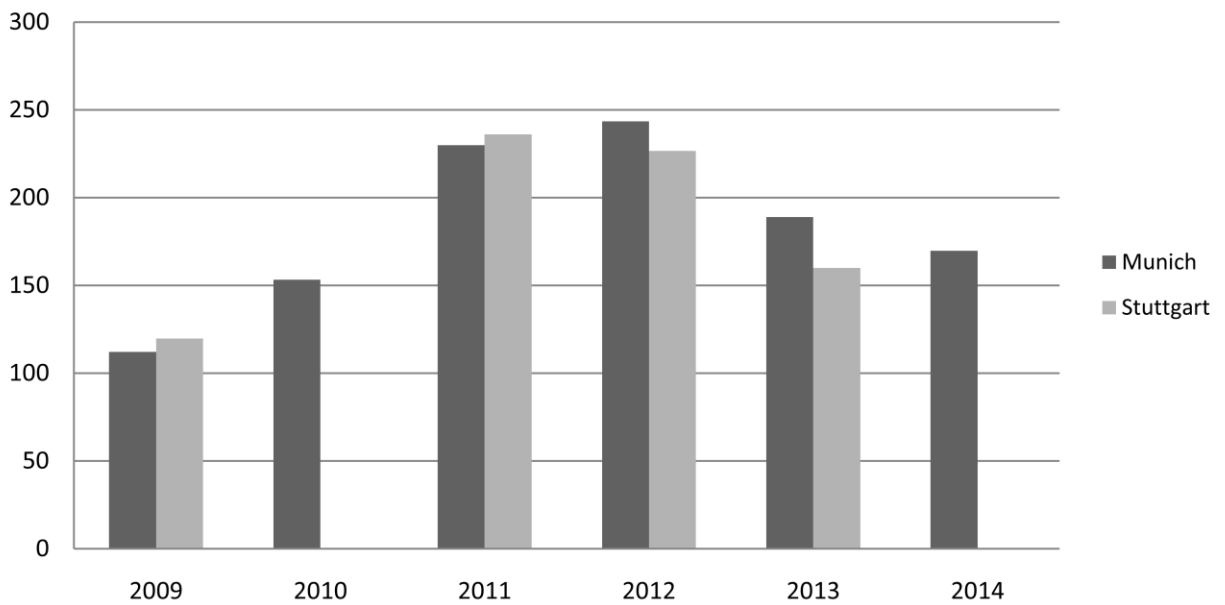
Source: AMA - AgrarMarkt Austria 2014

## Prices at Wholesale Level

### Germany

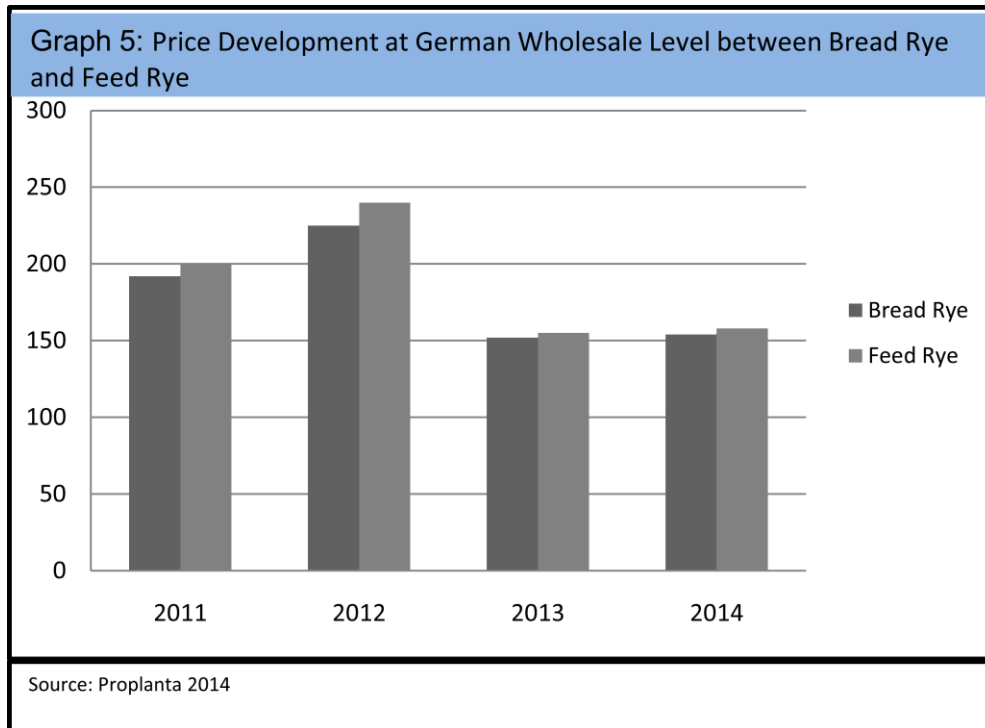
Wholesale prices for rye are 0-20€ (US\$ 0-24.95) above producer price level (Proplanta 2014). German wholesalers mainly buy at regional grain exchanges. At these exchanges, rye is directly bought and ready for pick up (Universal Lexikon Academic 2012). Regional grain exchanges mean different prices for every region. Figure 2 shows the different price developments at two regional grain exchanges from 2009 to 2014.

Graph 4: Market Price Development 2009 - 2014 in Germany



Source: AMA - AgrarMarkt Austria 2014

Furthermore, prices also vary by the different categories of rye. Figure 2 shows that although the overall trend in bread rye and feed rye may be the same, the prices still differ.



It should be noted that for Figure 1 and 2 no data for organic rye could be found. For estimating organic rye prices an average markup of 115€/MT can be added. Apart from a few slumps within each year the German price level shows an overall rising trend.

### ***The US***

US wholesalers, which are typically grain mills, process and package the grain and sell to facilities such as bakeries, distilleries and retail stores (Grainmillers.com 2014). In 2010, feed grade rye was selling for US\$ 4.44 for 25.5kg (a bushel, around US\$ 174.8/MT) and 2011 the price averaged US\$ 7.34 for 25.5kg (around US \$288.96/MT). These prices are weighted average and include Free on Board (FOB) (USDA Feed and Grain Database 2014). A MT rye is equivalent to 39.3680 bushels of rye (Alberta - Agriculture and Rural Development 1999).

The US prices for rye increased over 60% in the last five years. In 2009, 25.5kg cost US \$4.93 and in 2013 it was at US\$ 7.93. Averaging around US\$ 6.67/25.5kg (US\$ 262.6/MT). The prices were steadier over the last two years (YCharts 2014).

<b>Table 11: Historical cost per bushel to produce Organic Rye in US.</b>					
	2009	2010	2011	2013	2014
Cost per bushel	4.93	5.03	7.76	7.93	7.96

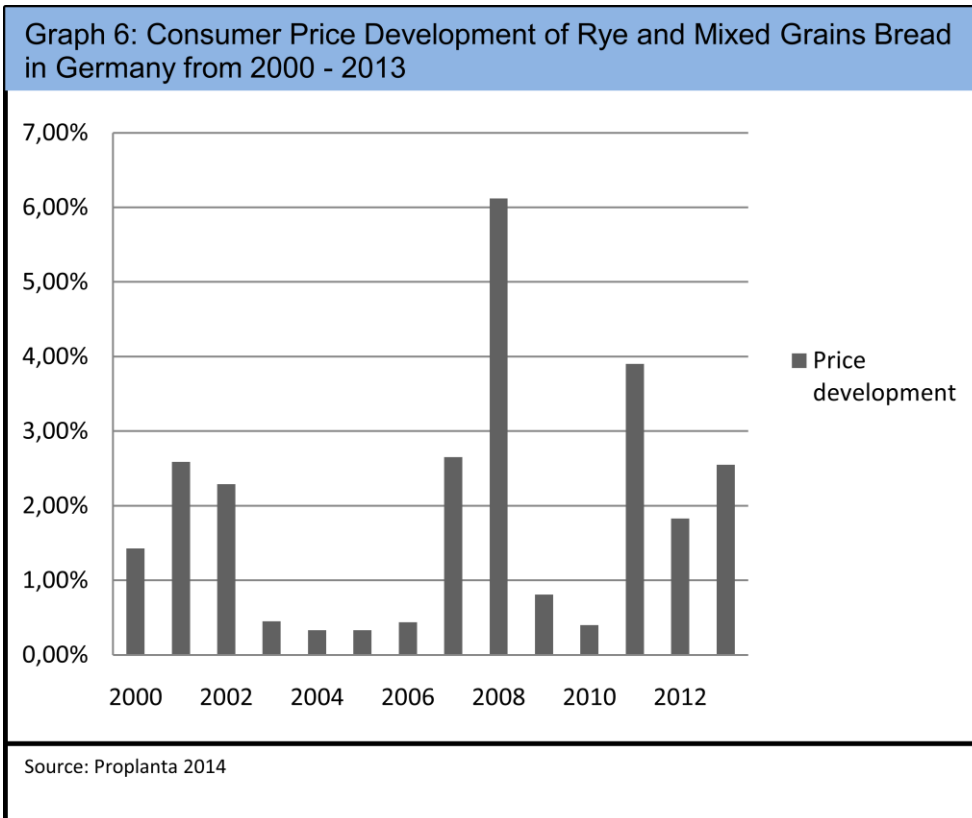
## **Prices at Retail Level**

### ***The US***

The primary products based on organic rye in the US are rye berries, flour, and the grain itself. Retail prices vary from US\$ 2.2/kg to US\$ 6.58/kg for less than 5lb (2.27kg) packages and packaging sizes vary from 1lb to 50lb (0.45kg - 22.68kg) packages. The average pricing for organic rye berries is US\$ 5.32/kg for 1lb to 5lb. Certain retailers sell closer to wholesale prices because they ship directly from the manufacturer. The average pricing for organic rye flour is US\$ 5.46/kg for less than 5lb (2.27kg) packaging. The markup of organic rye over regular rye flour, is US\$ 3.00 per 5lb bag. These two products offer discounted prices per pound, if they are purchased in bulk packaged in 25lb (11.34kg) or 50lb (22.68kg) bags. Organic rye grain is sold without additional processing but mainly in bulk quantities ranging from US\$ 1.58/kg to US\$ 4.25/kg. These prices were taken from nuts.com, lherb.com, breadtopia.com, Bob's Red Mill/Vitacost.com, and Great River Organic Milling/Amazon.com.

### ***Germany***

German rye products are similar to the US and are offered in special organic stores or bigger retail chains. Retail prices for rye products depend heavily on supply and demand. The following graph demonstrates consumer price development over the last 13 years. Even though the data does not explicitly show organic bread it gives an idea over how volatile price trends can be. It also shows that prices were continually higher compared to the year before.

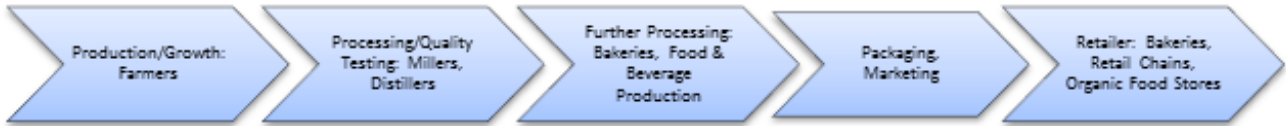


In Germany, current organic rye bread prices vary between 1.98€/kg and 4.6€/kg. Rye berries are sold between 1.35€/kg and 2.29€/kg. Rye flour prices can range between 1.35€/kg and 1.99€/kg (Rewe Bio, Alnatura, Rossmann Bio). These prices, however, were collected in November and in a certain region of Germany which means that variations are possible.

## Value chain

The US and German value chains are similar and start with producers growing organic rye grain. The harvested grain is sold to mills or bioenergy plants; sometimes it is marketed directly. The rye can then be further processed. Mills will store, export, process, package or directly sell the product. Some millers will process the organic rye to be sold to other businesses such as whiskey and bread manufacturers. These manufacturers process the organic rye into the finished products to be sold to retailers and consumers.

**Figure 7: Value Chain - Grain Trade**



Source: Information Medien Agrar e.V. 2014; Bundesprogramm Ökologischer Landbau 2002

The value added for the product lies in the packaging, marketing, and for organic products mostly in its quality and health benefits. The implementation of these values takes place throughout the processes (Information Medien Agrar e.V. 2014; Bundesprogramm Ökologischer Landbau 2002). Table 12 illustrates price development during the value chain for bread rye in 2014. Prices changes for every step of the value chain could not be determined, but an overall development on producer, wholesale and retail prices is given.

<b>Table 12: Price Development at Value Chain for Bread Rye in 2014</b>			
<b>Avg. Prices per kg in 2014</b>	<b>Producer Level Bread Rye</b>	<b>Wholesale Level Bread Rye</b>	<b>Retailer Level Rye Bread</b>
<b>US</b>	US\$ 0.31	-	US\$ 5.46
<b>Germany</b>	US\$ 0.32	US\$ 0.323	US\$ 4.09

## 6. Distribution channels

### *Supply Chain*

The distribution channel structure in Germany and US are similar. Intermediaries in Germany and US vary based on the end use of organic rye.

**Figure 8: Supply Chain**



Source: Own illustration based on previous chapters of this paper

### *Growing and Harvesting*

Production starts with farmers acquiring seeds from seed mills and planting. Farmers must be certified as organic farmers to produce certified organic rye. It is harvested and stored until transported (NC State University 2013). Before the grain is transportable, its moisture content must be a maximum of 14%. This usually takes one to two months and helps to protect the grain from mold infestation and ergot. A certain percentage of ergot in the harvested rye will make the harvest unfit for feed or food usage but can be managed with crop rotation or tillage (TIS 2014; Wiersma et al. n.d.).

### *Storage*

Rye grain has to be stored in dry, odorless and clean rooms. Additionally, the store room needs to be free of vermin. These conditions also hold for transportation. If these rules are followed, dry rye can be stored up to twelve months (TIS 2014). The storage of the grain can occur in different parts of the distribution chain. In the US, the grain is usually stored on farms for local shipment. For shipments of a greater distance, the grain is stored in grain elevators (Meersman 2014).

### *Transport*

Organic rye can be transported via ship, train, or truck. Therefore, it is usually transported in bulk containers and only as bagged cargo in standard containers. While shipping different kinds of grain, heavy grains like wheat and rye have to be stored in the lower part of the shipping space. Light grains like oats are stored in the upper part for more stability. In addition, the “Code for Safe Carriage of Grain in Bulk” by the International Maritime Organization (IMO) has to be considered (TIS 2014). Field crops are transported 16.6% by truck, 44.1% by rail, and 27.4% by ship (FAPRI 2004).



Rye distribution in Germany is usually facilitated by an importer/distributor; most retailers do not import themselves. The importers typically handle shipping, warehousing and moving of the products within the country. They handle regulations and customs as well (USDA 2011).

### ***Grain Processors/ Millers***

Some of the grain will be transported to facilities or millers for further processing. These companies will take this grain and process it into different products like grain berries, flour, ethyl alcohol, and feed (Grain Processing Corporation.com, Grain Millers, Inc.com). Mills can be wholesalers or retailers. They not only process rye but package the flour or grain into quantities for retail sales. During this phase of the distribution channel, the rye may be processed into other products like bread, cereals, etc. It can also be sold to the end user in retail stores or online.

### ***Competition in the Supply Chain***

Based on the data in this report the US organic rye farmers will compete with other farmers, millers, and countries exporting organic rye to the US. The millers will compete with other mills, exporting countries, and retailers. The secondary processors (bakeries and alcohol producers) will compete with other processors for suppliers and customers.

In Germany, the competition among farmers as well as among mills is not very high because co-operations are long-term. As mills usually only use regional grain their partners are local and therefore limited. Which means both farmers and mills are dependent on each other and do not change partners often. As a new exporter it might be difficult to step into cooperation with a mill due to the already established co-operations (Sessler 2014).

### ***Comparison of Value Chain and Supply Chain***

The value chain and supply chain are very similar. The value chain creates value through the processing of the organic rye. The supply chain provides needed resources like transportation. However, there are two big differences between the value and the supply chain. One is in the processing stage where value is added and profit is made. The second difference lies in the stage of packaging and marketing where organic labels add an important value to the final product. (Comparison based on EOS report data and Asif Rafique Bhatti 2009).

# 7. Commercial practices

## Germany

Grain trade in Germany is regulated by “Einheitsbedingungen im deutschen Getreidehandel”. These regulations provide the basis for any contracts concerning grain trade within Germany and with countries near the German border (BiolandMarkt 2007). The regulations do not apply to overseas trade. For this, traders usually use contracts provided by the “Grain and Feed Trade Association” (Gafta 2014).

The majority of rye is being supplied by German producers. Suppliers and buyers usually have long term contracts that determine all needed guidelines for observance of quality, delivery and payment requirements. Traded grain - in this example rye - is considered as food upon harvesting. Suppliers are required to fulfill all current regulations, clauses and laws concerning food.

First contact by farmers is done directly. That means farmers contact mills and communicate their offer. The first contact can also be established by associations of farmers. Contracts with fully-qualified traders and companies are usually required in written form, whereas agreements in agriculture can be concluded verbally. If the trading partners already have a contract, orders can also be made by phone, fax or e-mail. Orders are on short-term demand (Barth 2014). Contract specifications like payment, delivery date etc. can be defined individually. Normal payment is done on account with the usual payment conditions of 30 days (Barth 2014).

As previously mentioned, commonly used modes of transportation are ship, truck, and railroad (TIS 2014). Regulations depend on the mode of transportation. Within Germany train and truck transports are possible. For rail transportation the seller must order the wagon and make sure that all required regulations like fitness for and safe transport are given. Additionally, cleaning standards are required, which are for truck transportation written down in cleaning schedules. Rye that is transported by ship is usually imported from outside of Germany. For this process regulations for CIF or FOB contracts apply (BiolandMarkt 2007).

## The US

Grain trade in the US is regulated according to the standards in place by the National Grain and Feed Association (NGFA). These regulations were adopted in 1902 and have adapted to stay current, with the electronic trading rules, for example. Similar to Germany, these regulations do not cover oversea imports, only imports from Canada.

While the US does import more rye than it exports, the country makes an effort to purchase from local farmers. The majority of the rye production in the US takes place in Georgia and Oklahoma. According to the NGFA Grain Trade Rules, suppliers are urged to use a broker to work as the mediator between them and the buyer. The broker can be a person or simply a firm

that is present for electronic trading. The supplier would hire the broker who will make contact with the local mills and buyers. Once the supplier and the buyer make an agreement, both the supplier and the buyer must send a written confirmation to each other confirming the contract. Grain can be sold on the basis of samples, meaning it is the seller's duty to furnish a sample of the grain to the prospective buyer. In the event of a quality discrepancy, the rejected shipment should be compared against the sample of grain that was provided. This comparison will be done by an Inspection Committee or some other authorized or agreed upon committee. The ruling of the appointed committee is final. If the ruling is in favor of the buyer, and the seller fails to make the adjustment, the seller is responsible for fully reimbursing the buyer through invoice.

Similarly to Germany, most suppliers and buyers of rye have long standing and stable relationship. Also, similar modes of transportation are covered in the Grain Trade Rules: truck, rail, and barge. Regulations around the types of transportation and the standards that go with each are covered at length within the rules. Due to the amount of rye transported, rail and truck are the most common carrier methods. (NGFA Grain Trade Rule, 2014)

# 8. Packaging and labeling

## Packaging

Packaging of rye takes several forms. General forms include totes and bags. Totes (soft totes or super-sacks) that are woven polyethylene, provide easy transportation and hold up to 900kg. Wholesale bags also provide easy transportation and handling that can hold up to 22.7kg. Bags (pillow bags) are heat-sealed polyethylene that can hold between 500g and 5kg of rye (Grain Millers 2013). Additionally, since trends in consumption for organic products are increasing, demand for ecological packaging is also increasing. Because of this, the sector has developed a variety of different eco-friendly packaging made from renewable raw materials like corn, sugar or grain (Interpack n.d.).

Packaging needs to follow the EU packaging standards. Polyethylene is a plastic layer used for packaging and it is subject to EU Regulation No. 1183/2012 (Intertek 2013). Germany specifically has established legislation that contains certain rules for the disposal of packaging materials. Because of this, a cooperative effort for collecting and recycling packaging materials was initiated. The organization is called the "Duales System Deutschland," and it administers the use of the "Green Dot". This is a recycling symbol that can be found on the packaging material of all products sold in Germany. The importer pays a license fee to the packaging company (depending on the type and amount), and provides the exporter with the necessary information. Some other European countries like France, Austria and Belgium have similar programs (Export.gov 2008). There is also a license "Die Lizenzierungspflicht (§6 Abs. 1 VerpackV)" in Germany which forces all entrepreneurs to pay a license fee for packaging any good which is intended to be sold either commercially or privately (Joachim Schiller 2009). The "Duales System Deutschland" can, in addition to retail sales, also be applied by exporters to the transport packaging. Under this subcategory, producers and distributors are responsible for the recycling and labeling of the transport packaging that they put into circulation. The packaging forms and standards do not differ for either general or organic rye.

Food packaging regulation in the US is controlled by the FDA. Standards for organic foods have been developed by the Codex Alimentarius Commission of the WHO/FAO in the "Guidelines for the Production, Processing, Labeling and Marketing of Organically produced Foods". These guidelines hold for all countries and do not only affect import requirements but also help consumers to identify organic products. In addition, exporters have to consider the "WTO Agreement on Technical Barriers to Trade" which outlines the product and quality descriptions, labeling, packaging and fair practices in trade.

In European countries, standards for organic foods have been covered by Council Regulation (European Community) No. 834/2007 on organic production and labeling of organic products. It sets out the objectives and principles of organic production, packaging, labeling, controlling and trade with third countries. Organic products imported into Germany should take into account the

international standards mentioned in Codex Alimentarius (German Customs Administration 2014).

It should be noted that there are no sub-national regulations for packaging and labeling requirements and standards in Germany or in US.

## **Labeling**

The EU does not generally legislate packaging and labeling requirements; however, product-specific packaging and labeling requirements are applicable to rye, as the EU considers rye (and food-stuffs in general) to be “high-risk”. While rye and food-stuffs in general are considered “high-risk”, EU customs legislation still only regulates administrative procedures, such as the type of certificate necessary and identification of who last handled the product (Export.gov 2014).

Organically farmed products are held to even stricter EU guidelines. All labels must be easy to understand and visible as well as legible. The size of the font or characters must be at least 1.2mm. The language of the label must be easily understood by the customer, and if necessary, should be in several languages. Organic farmers, processors and traders must comply with the strict EU requirements, in order to use an EU organic label on their products.

Once requirements have been met and certified by the EU, the rye label itself must include:

- the name of the producer, processor or distributor who last handled the item
- the name or code number of the national certification authority
- the name or code number of the control authority or body in the EU which checked the operator (European Commission Organic 2014)

Goods that fall within the scope of Council Regulation No. 834/2007 can be labelled and advertised as “eco” and “bio” to describe an organic product, its ingredients or raw materials. The labelling of an organic product must be clearly visible on the packaging. On the package, a reference to the control body that certifies the organic product must be visible. Since July 2010, the use of EU logo on organic food products is mandatory as an indication of organic ingredients, raw materials used in the product. However, the use of EU logo is limited to products which contain almost only organic ingredients in order not to mislead consumers about the organic nature of the product. The term cannot be used as label if 95% of the ingredients of products or processed food are organic. Goods that are labelled as “organic” must be free from genetically modified organisms and should be produced by the use of processing methods that maintains the quality in all stages of the production chain. In addition to this, for consumer protection and fair competition, the terms used to indicate organic products should be protected from being used on non-organic products (German Customs Administration 2014).

Within the US, the labeling of non-retail containers, used to ship organic agricultural products, must include:

- the name and contact information of the certifying agent who certified the business who manufactured or processed the product
- a seal, logo, or other identifying mark of the agent
- information which proves the product is organic
- handling instructions needed to maintain the integrity of the product
- the USDA seal
- a production lot number (USDA National Organic Program 2010)

Under the National Organic Program, products in the US must, like in Germany, be certified as organic, in order to be labeled as organic. Organic farmers, ranchers, and food processors must follow a defined set of standards to produce organic food. These standards follow the product from farm to table, including soil and water quality, pest control, livestock practices, and rules regarding food additives. Once the USDA has deemed a product, like rye, organic, the USDA provides a logo, which certifies that a product has met the organic requirements and can be placed on the label (USDA Organic Standards 2013).

The Federal Ministry of Food and Agriculture aims to maintain the German and European standards of consumer protection in the transatlantic trade and investment agreement with the US. In the US, genetically modified food is produced and sold without labeling. However in EU, labeling is mandatory if the proportion of authorized genetically modified organisms exceeds 0.9 percent. According to The Federal Ministry of Food and Agriculture, this free trade agreement must not conflict with the objectives of transparency, freedom of choice, health and environmental protection (Federal Ministry of Food and Agriculture 2014).

## 9. Sales promotion

The most common types of sales promotion in grain trade are trade fairs and exhibitions. Producers can showcase their products to a number of traders and potential buyers. The traders have the possibility to explore the industry and sample the product. In Germany, the majority of producers are small agricultural enterprises without the needed resources to promote their product professionally. Because of that, associations of farmers or marketing companies are being formed in order to help the producers promote their products regionally or Germany-wide. These organizations stand for fair, transparent and efficient trade. The associations of farmers participate at trade fairs and exhibitions representing the small agricultural enterprises and their products (Vermarktungsgesellschaft Bio-Bauern 2014; Bioland 2014).

However, a trend toward online promotion and trading has been rising. Online trading portals allow sellers and buyers to promote their business in an efficient way over a wider area (Forbes 2013).

The following is a list of major trade fairs and exhibitions in Germany and the US.

### Trade fairs and exhibitions

#### ***Germany***

##### *Anuga Köln*

Koelnmesse GmbH

Messeplatz 1

50679 Cologne, Germany

[www.anuga.de](http://www.anuga.de)

Phone:(+49) (0) 221 821-2240

##### *Agra 2015*

agra Veranstaltungen GmbH

Friedrich-Ebert-Str. 26

04416 Markkleeberg, Germany

[info@agra2015.de](mailto:info@agra2015.de)

[www.agra2015.de](http://www.agra2015.de)

Phone: (+49) (0) 341 3389327

##### *BIOFACH*

NürnbergMesse GmbH

Messezentrum

90471 Nuremberg, Germany

[www.biofach.de](http://www.biofach.de)

Phone: (+49) (0) 911 86 06-89 96

*BioNord*

*BioWest*

*BioSüd*

*BioOst*

Regional organic trade fairs

[www.biomessen.info](http://www.biomessen.info)

*International Green Week*

Messe Berlin GmbH

Messedamm 22

14055 Berlin, Germany

[igw@messe-berlin.de](mailto:igw@messe-berlin.de)

Phone: (+49) (0) 30 3038-0

Phone: (+49) (0) 30 3038-2027

Phone: (+49) (0) 30 3038-2042

### ***The US***

*All Things Organic Conference & Trade Show*

McCormick Place Convention Center

Chicago, IL

USA

<http://tradeshow.tradekey.com/all-things-organic-conference-trade-show-e863.htm>

*Better Living Home Garden & Lifestyle Show*

Portland Expo Center

2060 Marine Drive

Portland, OR

USA

[www.betterlivingshow.org](http://www.betterlivingshow.org)

Phone: (+1) 541-482-3722

***BIOFACH AMERICA***

Baltimore Convention Center

Baltimore, MD

USA

Host: NürnbergMesse GmbH and Penton Media Inc.

[www.biofach-america.com](http://www.biofach-america.com)



*Natural Products Expo East*

Baltimore Convention Center  
One West Pratt Street  
Baltimore, MD  
USA  
Customer Service: (+1) 303-390-1776  
[www.expoeast.com](http://www.expoeast.com)

*Natural Products Expo West*

Anaheim Convention Center  
800 West Katella Avenue  
Anaheim, CA  
USA  
Customer Service: (+1) 866-458-4935  
Registration: (+1) 866 458 4935

*Sustainable Foods Summit North America*

Mike Dovich  
North American Representative Office  
2640 Greenwich Street #405  
San Francisco, CA 94123  
USA  
Phone: (+1) 415 254 1116  
E-Mail: [info@sustainablefoodssummit.com](mailto:info@sustainablefoodssummit.com)

The leading authority within the North American Organic Market (US and Canada) is the Organic Trade Association (OTA).

<https://www.ota.com/>

## **Online trade platforms**

*Organic Trade Exchange*

<http://www.o-tx.com>  
otx AG  
Am Langenberg 17  
29456 Hitzacker, Germany  
Phone: (+49) (0) 5862 17 99 800

*Mercaris*

<http://www.mercaris.com>  
c/o 1871

222 W Merchandise Mart Plaza, Suite 1212  
Chicago, IL  
USA  
Phone: (+1) 301 495 4900  
E-Mail: info@mercaris.com

## **Trade magazines**

*Acres U.S.A.* covers “real world organic & sustainable farming info every month”.

*Acres U.S.A.*  
www.acresusa.com  
Phone: (+1) 512 892 4400  
E-Mail: info@acresusa.com

*www.organic-bio.com* is an international website dedicated to organic food wholesale and supply companies.

www.organic-bio.com  
IPOREX SA  
av. de Champel 69  
CH-1206 Geneva  
Phone: +41 22 7898989  
E-Mail: info@organic-bio.com

*BIOwelt* is a German online magazine that addresses all subjects regarding the organic market (BIOwelt 2014).

*BIOwelt*  
www.BIOwelt-online.de  
INGER Verlagsgesellschaft mbH  
Luisenstraße 34  
49074 Osnabrück, Germany  
Phone: +49 541/580544-43

The website *ami-informiert.de* offers a special service where weekly newsletters containing analyses about the organic market situation, including organic grains, will be sent out to subscribers.

*AMI natürlich informiert.*

<http://www.ami-informiert.de/ami-shop/ami-shop-startseite/markt-service/oeko-landbau.html#c325>

Agrarmarkt Informations-Gesellschaft mbH

Dreizehnmorgenweg 10

53175 Bonn

Phone: +49 228 33805-0

E-Mail: [info@AMI-informiert.de](mailto:info@AMI-informiert.de)

# 10. Market prospects

## Germany

Germany is a large market with consumption growth of rye of 14% from 2009 to 2013. Increase in production was at 1% over the same time period. This continuous growth gives a favorable outlook and implies a positive trend for demand of organic rye.

The import market looks promising since German imports increased 47% from 2009 to 2013. A new trend in Germany is the consumption of vegan food. About 1% of the Germans eat a vegan diet and it is believed that this number will increase. This is a big opportunity for producers of organic rye since this group of customers does not only eat vegan but due to its attitude and behavior regarding health and environment also sticks to organic products (BÖLW 2014).

Another growing market is the market for bioethanol. The trend shows that bio-energy will be more important in the future. An EU guideline called “Renewable Energy Directive” (RED) demands that 10% of renewable energies should be deployed in the transport sector by 2020. In 2013 rye, together with wheat, was the dominant commodities used for bioethanol production (Proplanta 2014).

As a substitute product for nutrition, wheat is the main competitor of rye. But with an increasing consumption of rye and its lower prices, rye might gain more market share. This holds also for rye used as animal feed (Ryebelt 2014).

There is a change in duty within the EU. The European Commission decided to impose an import duty on rye in 2014 in hopes to increase the price of rye. This duty could have a negative effect on the market making it less desirable to import rye into Germany.

Due to strict political parameters, for German farmers it becomes more difficult and less profitable to produce organically, although the demand for organic products in general is growing (BÖLW 2014). Therefore, importers who are already certified as organic producers might get access to the German market and with this gain bigger market share.

In conclusion, the German market for organic rye is promising due to the increase in demand. But as German mills prefer local grain there is no big increase in imported organic rye expected. Only if the demand cannot be covered by the German market alone, it will lead to an increase in imports.

## The US

Even with strong competitors like corn and wheat there has been an increase in demand, which led to a growth of consumption of 46% from 2009 to 2013.

This growth is expected to continue with the increase for demand in organic products. US consumers are becoming more concerned about their health and the environment. Organic rye



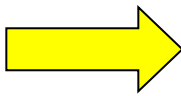

meets the US consumer's needs for a product that is healthy and environmentally friendly in production. However, due to the strict regulations enforced by the FDA (Food and Drug Administration) and the US Department of Agriculture (USDA), it is easier and less expensive for farmers to produce rye for animal feed than for human consumption. The regulations for being a "Certified Organic Farmer" are extremely strict and costly, making it more economical for a farmer to supply rye that is not certified organic if no adequate price markup is possible.

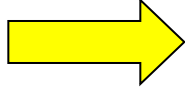
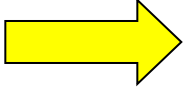
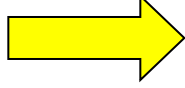
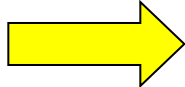
The US consumes 129% over their current production which creates a demand for the product that needs to be met by importers now and in the future. Specifically, the market for rye whiskey has grown 56% in 2011 and 46% in 2012. Major distillers believe that the growth will continue (ShankenNewsDaily 2013). This continued growth will increase the demand for organic rye; however, the increase in production was just under 10%. The growth in consumption is not being met by the increase in production so this demand will need to be met by importers.

In the US, a growing trend is for larger companies acquiring organic food producers and millers to compete with Organic Rye being imported into the US and meet the current consumption needs (Benzinga 2014).

Taking the US and Germany together, there is a positive trend for both countries but the US market offers more potential than the German market. We advise organic rye exporters rather to export to the US than to Germany.

**Table 13: Market Prospect Summary**

	<b>Market Prospect Summary</b>	<b>US and Germany</b>
Chapter	Increasingly/decreasingly attractive	One sentence explanation based on analysis in report
<b>2</b>		Production and consumption is slightly increasing.
<b>3</b>		Increasingly attractive due to higher demand of rye flour used for baking bread in Germany.
<b>4</b>		In Germany, less attractive due to new tariffs in 2014. In the US, tariffs stay at the same level.
<b>5</b>		There is a trend of rising prices but as prices are dependent on the harvest and with this on the weather conditions, prices are not very predictable.

6		Distribution channel in general remains the same. New exporters may arise in future.
7		Commercial practices remain the same as e.g. there are no other possible forms of transport.
8		Demand for ecological packaging is increasing Other package and labeling regulations might stay the same
9		There is a trend towards online promotion but as it is important to see the product, trade fairs remain important.

# References

AACC International 2013, *AACCI's Whole Grains Working Group Unveils New Whole Grain Products Characterization*. Available from: <<http://www.aaccnet.org/about/newsreleases/Pages/WholeGrainProductCharacterization.aspx>>. [28 October 2014].

Agrar Heute 2014, *Erzeugerpreise*. Available from: <<http://www.agrarheute.com/roggen-551191?mode=kassamarkt>>. [01 December 2014].

Agricultural Marketing Resource Center, 2012: <[http://www.agmrc.org/commodities\\_\\_products/grains\\_\\_oilseeds/rye-profile/](http://www.agmrc.org/commodities__products/grains__oilseeds/rye-profile/)>. [03 November 2014].

AIB International 2014, *Bread Statistics 2014*. Available from: <[http://www.aibonline.org/aibOnline\\_/GenericForm.aspx?strOpen=/www.aibonline.org/resources/statistics/2014bread.html](http://www.aibonline.org/aibOnline_/GenericForm.aspx?strOpen=/www.aibonline.org/resources/statistics/2014bread.html)>. [12 November 2014].

Albert Park Naturopathic Centre 2013, *Lignans - The New Phytonutrient*. Available from: <<http://albertparknaturopathy.com.au/lignans-the-new-phytonutrient/>>. [10 October 2014].

Alberta - Agriculture and Rural Development 2011, *Harvesting and Storage of Fall Rye*. Available from: <[http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/agdex4460](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex4460)>. [13 October 2014].

Alberta - Agriculture and Rural Development 1999, *Bushel/Tonne Converter*. Available from: <<http://www.agriculture.alberta.ca/app19/calc/crop/bushel2tonne.jsp>>. [02 November 2014].

AMA - Agrarmarkt Austria 2014, *Erzeugerpreise Bayern, frei Lager Erfasser*. Available from: <[http://www.ama.at/Portal.Node/public?gentic.rm=PCP&gentic.pm=gti\\_full&p.contentid=10008.184747&140\\_Erzeugerpreise\\_\\_bayern.pdf](http://www.ama.at/Portal.Node/public?gentic.rm=PCP&gentic.pm=gti_full&p.contentid=10008.184747&140_Erzeugerpreise__bayern.pdf)>. [06 December 2014].

AMA - Agrarmarkt Austria 2014, *Marktpreise international ab 2004 für Brotweizen, Futtergerste, Brotroggen und Körnermais*. Available from: <[http://www.ama.at/Portal.Node/public?gentic.rm=PCP&gentic.pm=gti\\_full&p.contentid=10008.184746&130\\_Getreide\\_Marktpreise\\_EU\\_ab\\_2004\\_monatliche\\_Aktualisierung.pdf](http://www.ama.at/Portal.Node/public?gentic.rm=PCP&gentic.pm=gti_full&p.contentid=10008.184746&130_Getreide_Marktpreise_EU_ab_2004_monatliche_Aktualisierung.pdf)>. [06 December 2014].

AMI natürlichinformiert 2014. Available from: <<http://www.ami-informiert.de/ami-maerkte.html>>. [02 December 2014].

Anuga 2014. Available from: <<http://www.anuga.com/anuga/index-2.php>>. [19 November 2014].

Asif Rafique Bhatti 2009. Available from: <[http://www.scribd.com/doc/24064421/The-Difference-Between-Value-Chain-and-the-Supply-Chain#force\\_seo](http://www.scribd.com/doc/24064421/The-Difference-Between-Value-Chain-and-the-Supply-Chain#force_seo)>. [05 December 2014]

The Atlantic 2014, *How Rye Came Back*. Available from: <<http://www.theatlantic.com/magazine/archive/2014/09/how-rye-came-back/375061/>>. [12 November 2014].

Barth 2014: *Interview über Telefon, geführt von Nina Sips with Johannes Barth*, Vollkornbäckerei Barth GmbH, Kehrstraße 19 · 56332 Niederfell, 7th November 2014

Bauernverband 2012, *Bioenergie und nachwachsende Rohstoffe*. Available from: <<http://www.bauernverband.de/22-forstwirtschaft>>. [15 October 2014].

Benzinga 2014, *3 Big Companies That Dominate the Organic Foods Market*. Available from: <<http://www.benzinga.com/markets/commodities/14/07/4743999/3-big-companies-that-dominate-the-organic-foods-market>>. [05 December 2014].

Biofach 2014. Available from: <<https://www.biofach.de/en/>>. [20 November 2014].

Bioland 2013, *Wissenswertes zu Bioland-Lebensmitteln*. Available from: <http://www.bioland.de/infos-fuer-verbraucher/wissenswertes.html> [15 October 2014].

Bioland 2014, *Bioland-Partner: Erzeugergemeinschaften und Vermarktungsgesellschaften - Stand Juni 2014*. Available from: <[http://www.bioland.de/fileadmin/dateien/HP\\_Dokumente/Verlag/Bioland-Erzeugergemeinschaften\\_und\\_Vermarktungsgesellschaften.pdf](http://www.bioland.de/fileadmin/dateien/HP_Dokumente/Verlag/Bioland-Erzeugergemeinschaften_und_Vermarktungsgesellschaften.pdf)>. [17 November 2014].

Bioland Markt 2007, *Einheitsbedingungen im Deutschen Getreidehandel*. Available from: <[http://www.bioland-markt.de/fileadmin/bioland-markt/file/Einheitsbedingungen\\_im\\_Deutschen\\_Getreidehandel\\_Stand\\_2007.pdf](http://www.bioland-markt.de/fileadmin/bioland-markt/file/Einheitsbedingungen_im_Deutschen_Getreidehandel_Stand_2007.pdf)>. [22 November 2014].

Biomanantial 2014, *Export of Organic Products*. Available from: <<http://en.biomanantial.com/export-organic-products-a-200-en.html>>. [13 November 2014]

BIOWelt 2014. Available from: <<http://www.biowelt-online.de/anzeigen.html>>. [27 November 2014].

Blobaum, R n.d., *Organic Farmers in 17 State Market Commodities at Premium Prices*. Available from: <<http://rogerblobaum.com/eggen-history/>>. [24 November 2014].

Bob's Red Mill 2014, *Organic Rye Berries*. Available from: <http://www.bobsredmill.com/organic-rye-berries.html> [15 October 2014].

BÖLW 2013, *Die Bio-Branche 2013*. Available from: <[http://www.boelw.de/uploads/media/pdf/Dokumentation/Zahlen\\_\\_Daten\\_\\_Fakten/ZDF\\_2013\\_Endversion.pdf](http://www.boelw.de/uploads/media/pdf/Dokumentation/Zahlen__Daten__Fakten/ZDF_2013_Endversion.pdf)>. [13 November 2014].

BÖLW 2014, *Die Bio-Branche 2014*. Available from: <[http://www.boelw.de/uploads/media/ZDF\\_2014\\_BOELW\\_Web.pdf](http://www.boelw.de/uploads/media/ZDF_2014_BOELW_Web.pdf)>. [12 November 2014].

BÖLW 2010, *Die Bio-Branche 2010*. Available from: <[http://www.boelw.de/uploads/media/pdf/Dokumentation/Zahlen\\_\\_Daten\\_\\_Fakten/ZDF2010gesamt.pdf](http://www.boelw.de/uploads/media/pdf/Dokumentation/Zahlen__Daten__Fakten/ZDF2010gesamt.pdf)>. [12 November 2014].

Briggle. L.W. 1959, *Farmers Bulletin No. 2145, Growing Rye*, Available from: <<http://digital.library.unt.edu/ark:/67531/metadc1498/m1/2/>>. [20 October 2014].

Bundesprogramm Ökologischer Landbau 2002: *Endbericht zum Projekt 02OE246 im Rahmen des Bundesprogramms ökologischer Landbau*. Available from: <<http://lgdata.s3-website-us-east->



1.amazonaws.com/docs/380/49275/141024\_Harvard\_citation\_style\_-\_All\_examples\_table.pdf>. [12 December 2014].

Bushuk, W., Cereal Foods World 2001, *Rye Production and Uses Worldwide*. Available from: <[http://www.agmrc.org/media/cms/bushuk\\_c8b79bab55bb0.pdf](http://www.agmrc.org/media/cms/bushuk_c8b79bab55bb0.pdf)>. [1 October 2014].

DLG 2006, *Zum Einsatz von Roggen in der Fütterung*. Available from: <[http://www.dlg.org/fileadmin/downloads/fachinfos/futtermittel/Roggen\\_Fuetterung.pdf](http://www.dlg.org/fileadmin/downloads/fachinfos/futtermittel/Roggen_Fuetterung.pdf)>. [14 November 2014].

DLG 2014, Factsheet - Herbst 2014. Available from: <[http://www.dlg.org/fileadmin/downloads/Trendmonitor/DLG-TrendmonitorEurope\\_FactSheet-Herbst-2014.pdf](http://www.dlg.org/fileadmin/downloads/Trendmonitor/DLG-TrendmonitorEurope_FactSheet-Herbst-2014.pdf)>. [14 November 2014].

Duty Calculator 2014, *Duty Calculator Country Guides*. Available from: <<http://www.dutycalculator.com/country-guides/information-on-CAFTA-DR/>>. [19 November 2014].

Emmanuel K. Yiridoe, Samuel Bonti-Ankomah and Ralph C. Martin, 2005. *Comparison of consumer perceptions and preference toward organic versus conventionally produced foods: A review and update of the literature*. Renewable Agriculture and Food Systems, 20, pp 193-205. doi:10.1079/RAF2005113

Encyclopedia Britannica 2014, *Combine (farm equipment)*. Available from: <<http://www.britannica.com/EBchecked/topic/127346/combine>>. [23 October 2014].

Encyclopedia Britannica 2014, *Rye (Cereal)*, Available from: <<http://www.britannica.com/EBchecked/topic/514534/rye>>. [23 October 2014].

Encyclopedia Britannica 2014, *Rye (Secalecereale) growing in Bavaria, Germany*. Available from: <<http://www.britannica.com/EBchecked/media/100319/Rye-growing-in-Bavaria-Germany>>. [23 October 2014].

Europa 2012, *Labelling of Foodstuffs*. Available from: <[http://europa.eu/legislation\\_summaries/consumers/product\\_labelling\\_and\\_packaging/co0019\\_en.htm](http://europa.eu/legislation_summaries/consumers/product_labelling_and_packaging/co0019_en.htm)>. [16 November 2014].

European Biodiesel Board 2014, *Statistics: The EU biodiesel industry*. Available from: <<http://www.ebb-eu.org/stats.php>>. [15 October 2014].

European Commission - Agriculture and Rural Development 2014, *Cereals, oilseeds and protein crops, rice*. Available from: <[http://ec.europa.eu/agriculture/cereals/index\\_en.htm](http://ec.europa.eu/agriculture/cereals/index_en.htm)>. [15 October 2014].

European Commission - Agriculture and Rural Development 2014, *The EU cereals regime*. Available from: <[http://ec.europa.eu/agriculture/cereals/factsheet-cereals\\_en.pdf](http://ec.europa.eu/agriculture/cereals/factsheet-cereals_en.pdf)>. [12 November 2014].

European Commission 2014, *Prospects for Agricultural Markets and Income in the EU 2013-2023*. Available from: <[http://ec.europa.eu/agriculture/cereals/presentations/cereals-oilseeds/medium-term-forecast\\_en.pdf](http://ec.europa.eu/agriculture/cereals/presentations/cereals-oilseeds/medium-term-forecast_en.pdf)>. [30 October 2014].

European Commission 2014, *Organic Certification*. Available from: <[http://ec.europa.eu/agriculture/organic/organic-farming/what-is-organic-farming/organic-certification/index\\_en.htm](http://ec.europa.eu/agriculture/organic/organic-farming/what-is-organic-farming/organic-certification/index_en.htm)>. [16 November 2014].

European Commission 2014, *Organic Certification, EU Logo*. Available from: <[http://ec.europa.eu/agriculture/organic/downloads/logo/index\\_en.htm](http://ec.europa.eu/agriculture/organic/downloads/logo/index_en.htm)>. [22 November 2014].

European Commission 2014, *EU sets import duty above zero for maize, sorghum and rye*. Available from: <[http://europa.eu/rapid/press-release\\_MEMO-14-488\\_en.htm](http://europa.eu/rapid/press-release_MEMO-14-488_en.htm)>. [30 October 2014].

European Commission 2014, *Phytosanitary Certificate*, 2014. Available from: <[http://madb.europa.eu/madb/viewPageIFPubli.htm?datasetid=MAIF-US14-05v001&filename=cf\\_phyt.html&hscod=1002&path=/data/website/madb/egif/prod/MAIF-US14-05v001/&imagepath=/egif/prod/MAIF-US14-05v001/&page=&country=United%20States%20of%20America&countryid=US](http://madb.europa.eu/madb/viewPageIFPubli.htm?datasetid=MAIF-US14-05v001&filename=cf_phyt.html&hscod=1002&path=/data/website/madb/egif/prod/MAIF-US14-05v001/&imagepath=/egif/prod/MAIF-US14-05v001/&page=&country=United%20States%20of%20America&countryid=US)>. [14 December 2014].

European Commission 2014, *SPS: Sanitary and Phytosanitary Issues*. Available from: <[http://madb.europa.eu/madb/sps\\_crossTables.htm](http://madb.europa.eu/madb/sps_crossTables.htm)>. [14 December 2014].

European Commission 2014, *EU Tariffs*. Available from: <[http://madb.europa.eu/madb/tariffLibDetailPubli.htm?langId=EN&datacat\\_id=AT&countryid=&submit=Search&countries=AF&hscod=1002100000](http://madb.europa.eu/madb/tariffLibDetailPubli.htm?langId=EN&datacat_id=AT&countryid=&submit=Search&countries=AF&hscod=1002100000)>. [14 December 2014].

European Commission - Communication and Information Resource Centre for Administrations, Businesses and Citizens 2014, *Market Prices*. Available from: <<https://circabc.europa.eu/sd/a/ee474160-d3d1-43ac-a306-02abd3038562/Market%20prices%20on%20EUROPA.pdf>>. [15 November 2014].

EU 2008, *Official Journal of the EU - Commission Regulation*. Available from: <<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008R0889&from=EN>> [14 November 2014]

Eventseye 2014, *Natural & Organic Food Trade Shows in USA (America)*. Available from: <[http://www.eventseye.com/fairs/cst1\\_trade-shows\\_usa-united-states-of-america\\_natural-organic-food.html](http://www.eventseye.com/fairs/cst1_trade-shows_usa-united-states-of-america_natural-organic-food.html)>. [14 November 2014].

Export Gov 2008, *FAQ: Packaging and Recycling Laws*. Available from: <[http://www.export.gov/faq/eg\\_main\\_017514.asp](http://www.export.gov/faq/eg_main_017514.asp)>. [14 November 2014].

Export Gov 2014, *Trade Regulations and Standards*. Available from: <[http://export.gov/Germany/MarketResearchonGermany/CountryCommercialGuide/TradeRegulationsandStandards/index.asp#P140\\_24122](http://export.gov/Germany/MarketResearchonGermany/CountryCommercialGuide/TradeRegulationsandStandards/index.asp#P140_24122)>. [17 November 2014].

FAO, 2012.FAOSTAT.*Food and Agriculture Organization of the United Nations*. Available from: <<http://faostat3.fao.org/home/E>>. [8 October 2014].

FAPRI 2004, *Grain Transportation and Marketing Channels*. Available from: <[http://www.fapri.missouri.edu/outreach/publications/2004/FAPRI\\_UMC\\_Briefing\\_Paper\\_04\\_04.pdf](http://www.fapri.missouri.edu/outreach/publications/2004/FAPRI_UMC_Briefing_Paper_04_04.pdf)>. [16 November 2014].

Fitzgerald, John, 2012, *Minnesota grains help fuel U.S. vodka movement*. Available from: <<http://www.minnpost.com/greater-minnesota/2012/02/minnesota-grains-help-fuel-us-vodka-movement>>. [30 October 2014].

Food and Agriculture Organization 2014, *Organic Agriculture*. Available from: <<http://www.fao.org/organicag/oa-faq/oa-faq6/en/>>. [22 October 2014].

Food Business News 2014, Bread market remains challenging. Available from: <[http://www.foodbusinessnews.net/articles/news\\_home/Business\\_News/2013/09/Bread\\_market\\_remains\\_challengi.aspx?ID=%7BDF39136B-7B1E-4C35-831E-558A8E92BAAF%7D&cck=1](http://www.foodbusinessnews.net/articles/news_home/Business_News/2013/09/Bread_market_remains_challengi.aspx?ID=%7BDF39136B-7B1E-4C35-831E-558A8E92BAAF%7D&cck=1)>. [14 October 2014].

Food Navigator 2012, *Whole grain food market to hit \$27.6 billion by 2017, with US leading the way*. Available from: <<http://www.foodnavigator-usa.com/Markets/Whole-grain-food-market-to-hit-27.6-billion-by-2017-with-US-leading-the-way>>. [14 October 2014].

Forbes 2013, *Mercaris Launches Organic & Non GMO Commodities Market Data Service*. Available from: <<http://www.forbes.com/sites/daniellegould/2013/10/10/mercaris-launches-organic-non-gmo-commodities-market-data-service/>>. [12 December 2014].

Foreign Trade Online 2014, *HS Codes*. Available from: <<http://www.foreign-trade.com/reference/hscodcfm>>. [14 October 2014].

Fuller, M. F., 2004. *The Encyclopedia of Farm Animal Nutrition*. CABI Publishing Series, 606 pp

Foreign Affairs, Trade and Development Canada 2014, *Canada-Korea Free Trade Agreement (CKFTA) - Overview*. Available from: <<http://international.gc.ca/trade-agreements-accords-commerciaux/agr-acc/korea-coree/overview-apercu.aspx?lang=eng>>. [30 October 2014].

Gafta 2014, *Contracts*. Available from: <<http://www.gafta.com/contracts>>. [12 November 2014].

Global Agricultural Information Network 2014, *Germany - Food Processing Ingredients*. Available from: <[http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Food%20Processing%20Ingredients\\_Berlin\\_Germany\\_9-15-2014.pdf](http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Food%20Processing%20Ingredients_Berlin_Germany_9-15-2014.pdf)>. [14 October 2014].

Globalization 101 2014, *Why do Nations import?*. Available from: <<http://www.globalization101.org/why-do-nations-import/>>. [02 November 2014].

GMF Vereinigung Getreide-, Markt- und Ernährungsforschung 2004, *Mehlreport: Mehr Roggen wagen*. Available from: <[http://www.gmf-info.de/medi/mehlreport/MehlReport01\\_04.pdf](http://www.gmf-info.de/medi/mehlreport/MehlReport01_04.pdf)>. [10 October 2014].

Grain Millers 2013, *Packaging Options*. Available from: <<http://www.grainmillers.com/packagingoptions.aspx>>. [09 November 2014].

GrünerPunkt 2014, *Disposal of Transport Packaging*. Available from: <<http://www.gruenerpunkt.de/en/customer/service/disposal-of-transport-packaging.html>>. [03 December 2014].

Information Medien Agrar e.V. 2014: *Die Getreide-Wertschöpfungskette - Die Mühlenbranche im Fokus*. Available from: <<http://www.ima->

agrar.de/fileadmin/redaktion/lehrermagazin/lmp\_2014\_2/ima\_imp\_2014-02\_UB\_Muehle.pdf>. [12 December 2014].

Interpackn.d., *Organic on the Inside! - Organic on the Outside?*. Available from: <[http://www.interpack.com/cipp/md\\_interpack/custom/pub/content,oid,17083/lang,2/ticket,g\\_u\\_e\\_s\\_t/~Organic\\_on\\_the\\_Inside\\_%E2%80%93Organic\\_on\\_the\\_Outside.html](http://www.interpack.com/cipp/md_interpack/custom/pub/content,oid,17083/lang,2/ticket,g_u_e_s_t/~Organic_on_the_Inside_%E2%80%93Organic_on_the_Outside.html)>. [24 November 2014].

Intertek 2013, *EU - Food Contact Plastics - Union List Amended*. Available from: <<http://www.intertek.com/sparkles/2013/eu-food-contact-plastics/>>. [22 November 2014].

ITC 2014, *Trademap*. Available from: <[http://www.trademap.org/tradestat/Country\\_SelProduct\\_TS.as](http://www.trademap.org/tradestat/Country_SelProduct_TS.as)>. [14 October 2014].

Jensen, L.A., North Dakota State University of Agriculture and Applied Science 1914, *Grow Winter Rye*. Available from: <[http://library.ndsu.edu/tools/dspace/load/?file=/repository/bitstream/handle/10365/7807/a\\_199\\_undated.pdf?sequence=1](http://library.ndsu.edu/tools/dspace/load/?file=/repository/bitstream/handle/10365/7807/a_199_undated.pdf?sequence=1)>. [9 October 2014].

Jochim Schiller 2009, *Die neue Verpackungsverordnung*. Available from <[http://www.jochim-schiller.de/site/56/Neue\\_Verpackungsverordnung.html#Geltung\\_Wer](http://www.jochim-schiller.de/site/56/Neue_Verpackungsverordnung.html#Geltung_Wer)>. [25 November 2014].

Julius Kühn-Institut 2010, *Roggen und Sorghum als alternative Energiepflanzen*. Available from: <[http://www.jki.bund.de/fileadmin/dam\\_uploads/\\_ZL/alternativeEnergiepflanzen/Roggen%20u%20Sorghum%20als%20alternative%20Energiepflanzen\\_Gesamtbeitrag.pdf](http://www.jki.bund.de/fileadmin/dam_uploads/_ZL/alternativeEnergiepflanzen/Roggen%20u%20Sorghum%20als%20alternative%20Energiepflanzen_Gesamtbeitrag.pdf)>. [1 November 2014].

Julius Kühn-Institut 2014, *Description of the National Plant Protection Organization (NPPO) of Germany*. Available from: <<http://pflanzenegesundheit.jki.bund.de/index.php?menuid=63>>. [14 December 2014].

Meersman, T. 2014, *Grain Shipments Still on Hold as Railroads Struggle to Keep up*. Available from: <<http://www.startribune.com/business/265773581.html>>. [21 November 2014].

Meyer, A., von Gagern, W., Schwarz, T., Pieszka, M., Kopuszanska-Rusek, M., Kamyczek, M., Heuer, C.H. - Ryebelt 2012, *Roggen in der Schweine und Rinderfütterung*. Available from: <[https://www.google.de/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&cad=rja&uact=8&ved=0CDAQFjAC&url=https%3A%2F%2Fwww.kws.de%2Fglobal%2Fshow\\_document.asp%3Fid%3Daaaaaaaaaanpsdo%26download%3D1&ei=3DxaVP\\_EK8OrPKW4gYgl&usg=AFQjCNEsf6fx41XGQg6wIUfKZDH-hQYMYA&sig2=BG266m-LJvHxtUE0\\_OkEmA](https://www.google.de/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&cad=rja&uact=8&ved=0CDAQFjAC&url=https%3A%2F%2Fwww.kws.de%2Fglobal%2Fshow_document.asp%3Fid%3Daaaaaaaaaanpsdo%26download%3D1&ei=3DxaVP_EK8OrPKW4gYgl&usg=AFQjCNEsf6fx41XGQg6wIUfKZDH-hQYMYA&sig2=BG266m-LJvHxtUE0_OkEmA)>. [18 November 2014].

Meyermühle 2014: Phone interview by Nina Sips with Tanja Wegmann, LandshuterKunstmühle C.A. Meyer's Nachfolger AG 84034 Landshut, 10 December 2014

National Grain and Feed Association (NGFA) 2014, *Trade Rules*. Available from: <<http://www.ngfa.org/trade-rules-arbitration/rules/>>. [16 November 2014].

NC State University 2013, *North Carolina Organic Grain Production Guide 2013*. Available from: <<http://www.cefs.ncsu.edu/resources/organic-grain-guide-2013.pdf>>. [20 November 2014].

New Europe 2014, EU sets import duty above zero for maize, sorghum and rye. Available from: <<http://www.neurope.eu/article/eu-sets-import-duty-above-zero-maize-sorghum-and-rye>>. [31 October 2014].

New York Times 2014, There's a Reason That Rye Is Having a Moment. Available from: <<http://www.nytimes.com/2014/02/02/magazine/theres-a-reason-that-rye-is-having-a-moment.html>>. [24 October 2014].

NGFA 2014, *Grain Trade Rules*. Available from: <[http://www.ngfa.org/wp-content/uploads/2014\\_Grain\\_Trade\\_Rules.pdf](http://www.ngfa.org/wp-content/uploads/2014_Grain_Trade_Rules.pdf)>. [13 November 2014].

Northern Grain Growers 2011, *Cereal Rye*. Available from: <<http://northerngraingrowers.org/wp-content/uploads/RYE.pdf>>. [16 October 2014].

NRW. Invest Germany 2014, *Customs*. Available from: <[http://www.nrwinvest.com/Business\\_Guide\\_englisch/The\\_tax\\_system/Customs1/index.php](http://www.nrwinvest.com/Business_Guide_englisch/The_tax_system/Customs1/index.php)>. [14 December 2014].

Office of the US Trade Representative 2012, *New Opportunities for U.S. Exporters under the U.S.-Korea Free Trade Agreement*. Available from: <<http://www.ustr.gov/trade-agreements/free-trade-agreements/korus-fta>>. [30 October 2014].

Office of the US Trade Representative 2014, *Tariff Schedules - Harmonized System and World Customs Organization*. Available from: <<http://www.ustr.gov/trade-topics/industry-manufacturing/industrial-tariffs/tariff-schedules>>. [16 November 2014].

OECD Library 2002, *Organic Agriculture: Sustainability, Markets and Policies*. Available from: <[http://www.keepeek.com/Digital-Asset-Management/oecd/agriculture-and-food/organic-agriculture/issues-for-consumers-of-organic-products\\_9789264101517-8-en#page11](http://www.keepeek.com/Digital-Asset-Management/oecd/agriculture-and-food/organic-agriculture/issues-for-consumers-of-organic-products_9789264101517-8-en#page11)>. [29 November 2014].

Ökolandbau 2014, *Förderung des Landbaus durch EU, Bund und Länder*. Available from: <<http://www.oekolandbau.de/erzeuger/oekonomie/foerderung/foerderung-des-oekolandbaus/>>. [27 November 2014].

Organic-bio.com 2014. Available from: <<http://www.organic-bio.com/de/verzeichnis/>>. [01 December 2014].

Organic Trade Association 2014. Available from: <<http://www.ota.com/index.html>>. [20 November 2014].

Organic Trade Association 2012, *Consumer-driven U.S. organic market surpasses \$31 billion in 2011*. Available from: <[http://www.organicnewsroom.com/2012/04/us\\_consumerdriven\\_organic\\_mark.html](http://www.organicnewsroom.com/2012/04/us_consumerdriven_organic_mark.html)>. [13 November 2014].

Organic Trade Exchange 2014. Available from: <[http://www.o-tx.com/de/start\\_otx/](http://www.o-tx.com/de/start_otx/)>. [02 December 2014].

Proplanta 2014, *Mediagalerie: Erläuterungen zum Terminmarkt - Großhandelspreis und Erzeugerpreis*. Available from: <[http://www.proplanta.de/Fotos/Erlaeuterungen-zum-Terminmarkt\\_Bild13096272900.html](http://www.proplanta.de/Fotos/Erlaeuterungen-zum-Terminmarkt_Bild13096272900.html)>. [13 November 2014].

Proplanta 2014, *Mehr Mais zu Bioethanol verarbeitet*. Available from: <[http://www.proplanta.de/Agrar-Nachrichten/Energie/Mehr-Mais-zu-Bioethanol-verarbeitet\\_article1412489590.html](http://www.proplanta.de/Agrar-Nachrichten/Energie/Mehr-Mais-zu-Bioethanol-verarbeitet_article1412489590.html)>. [15 November 2014].

Renewable Fuels Association (RFA) 2012 Ethanol Industry Outlook. Available from: <<http://www.ethanolrfa.org/page/-/2012%20Ethanol%20Industry%20Outlook.pdf?nocdn=1>>. [23 November 2014].

Roggenforum e.V. 2006, Roggen - Anbau und Vermarktung, Available from: <[http://www.landwirtschaft-mv.de/cms2/LFA\\_prod/LFA/content/de/Fachinformationen/Betriebswirtschaft/Oekonomie\\_Pflanzenproduktion/Wirtschaftlichkeit\\_des\\_Roggenanbaus\\_in\\_Mecklenburg-Vorpommern/Roggenbroschuere.pdf](http://www.landwirtschaft-mv.de/cms2/LFA_prod/LFA/content/de/Fachinformationen/Betriebswirtschaft/Oekonomie_Pflanzenproduktion/Wirtschaftlichkeit_des_Roggenanbaus_in_Mecklenburg-Vorpommern/Roggenbroschuere.pdf)>. [15 November 2014].

Ryebelt, 2014, *Market*. Available from: <[http://www.ryebelt.com/rb\\_markt.html?&L=1](http://www.ryebelt.com/rb_markt.html?&L=1)>. [10 November 2014].

Ryebelt 2014, Markt. Available from: <[http://www.ryebelt.com/rb\\_markt.html?&L=21201](http://www.ryebelt.com/rb_markt.html?&L=21201)>. [10 November 2014].

Ryebelt 2014, *Die Rolle des Roggen in der Ernährung des Menschen*. Available from: <[http://www.ryebelt.com/rb\\_humanernaehrung.html?&L=0](http://www.ryebelt.com/rb_humanernaehrung.html?&L=0)>. [11 October 2014].

Ryebelt 2014, *Preisbarometer Deutschland*. Available from: <<http://www.ryebelt.com/preisbarometer.html?&L=21201>>. [16 November 2014].

Ryebelt 2014, *Mit hochwertigem Roggen Futterkosten sparen!* Available from: <[http://www.ryebelt.com/rb\\_start.html?&L=0](http://www.ryebelt.com/rb_start.html?&L=0)>. [05 November 2014].

Rye and Health 2013, *Rye Grain*. Available from: <<http://www.ryeandhealth.org/composition/rye-grain>>. [20 October 2014].

Schaack, D., Rampold, C., Willer, H., Rippin, M., von Koerber, H., Bonn 2011: *Analyse der Entwicklung des ausländischen Angebots bei Bioprodukten mit Relevanz für den deutschen Biomarkt*. AgrarmarktInformationsgesellschaftmbH.

Schlegel, R 2010, *Rye: Genetics, Breeding, and Cultivation*, CRC Press, Florida. Available from: Google Books. [23 October 2014].

Sessler 2014: Phone interview by Nina Sips with Mr Rudolf, Sessler GmbH Mühlgasse 25 71272 Renningen, 10 December 2014

Shanken News Daily 2013, *Rye Whiskey Rising Fast, Spurred By Dynamic On-Trade Cocktail Culture*. Available from: <<http://www.shankennewsdaily.com/index.php/2013/11/11/7201/rye-whiskey-rising-fast-spurred-by-dynamic-on-trade-cocktail-culture/>>. [06 December 2014].

Silva, E., Pain, L., Barnidge, M., Carusi, C., McNair, R. 2012, *Organic Agriculture in Wisconsin: 2012 Status Report*. Available from: <<http://www.cias.wisc.edu/wp-content/uploads/2012/02/org12finalnewlowres021612.pdf>>. [11 November 2014].

Statista 2014, *Entwicklung der Verbraucherpreise für Roggen und Mischbrot in Deutschland*. Available from: <<http://de.statista.com/statistik/daten/studie/301702/umfrage/entwicklung-der-verbraucherpreise-fuer-roggen-und-mischbrot-in-deutschland/>>. [10 November 2014].

Team Canada 2004, *Exporting to the US*. Available from <<http://www.smallbusinessbc.ca/pdf/USGuideEnglish.pdf>>. [12 November 2014]

The University of Maine - Cooperative Extension Publications 2010, *Growing Organic Cereal Grains in New England*. Available from: <<http://umaine.edu/publications/2207e/>>. [20 October 2014].

Trade Agreements Compliance Program 2014, *What is a Foreign Trade Barrier?*. Available from: <[http://tcc.export.gov/Report\\_a\\_Barrier/do\\_you\\_face\\_trade\\_barrier.asp](http://tcc.export.gov/Report_a_Barrier/do_you_face_trade_barrier.asp)>. [09 November 2014].

Transport Information Service (TIS) 2014, Roggen. Available from: <<http://www.tis-gdv.de/tis/ware/getreide/roggen/roggen.htm#informationen> 3/11/14>. [10 November 2014].

United Nations Statistics Division 2014, *Detailed structure and explanatory notes*. Available from: <<http://unstats.un.org/unsd/cr/registry/regcs.asp?Cl=14&Lg=1&Co=045.1>>. [23 October 2014].

United Nations Statistics Division 2014, *Standard International Trade Classification (SITC) Revision 4*. Available from: <<http://unstats.un.org/unsd/pubs/gesgrid.asp?mysearch=Standard+International+Trade+Classification+%28SITC%29+Revision+4>>. [20 October 2014].

United Nations Statistics Division 2014, *International Standard Industrial Classification of All Economic Activities (ISIC), Rev.4*. Available from: <<http://unstats.un.org/unsd/cr/registry/isic-4.asp>>. [20 October 2014]

U.S. Customs and Border Protection 2006, *Importing into the US*. Available from: <<http://www.cbp.gov/sites/default/files/documents/Importing%20into%20the%20U.S.pdf>>. [03 November 2014].

US Department of Agriculture. Plant Guide. October, 2009. <[http://plants.usda.gov/plantguide/pdf/pg\\_elvi3.pdf](http://plants.usda.gov/plantguide/pdf/pg_elvi3.pdf)>. [15 October 2014].

USDA 2013, *EU-27 Grain and Feed Annual 2013*. Available from: <[http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Grain%20and%20Feed%20Annual\\_London\\_EU-27\\_4-4-2013.pdf](http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Grain%20and%20Feed%20Annual_London_EU-27_4-4-2013.pdf)>. [23 November 2014].

USDA APHIS 2014, *Permits and Certifications*. Available from: <<http://www.aphis.usda.gov/wps/portal/footer/topicsofinterest/applyingforpermit>>. [17 November 2014].

USDA 2012, *Crops*. Available from: <<http://www.ers.usda.gov/topics/crops/.aspx>>. [21 November 2014].

USDA 2013, *Background*. Available from: <<http://www.ers.usda.gov/topics/crops/wheat/background.aspx>>. [20 October 2014].

USDA 2014, *Grain: World Markets and Trade*. Available from: <<http://apps.fas.usda.gov/psdonline/circulars/grain.pdf>>. [17 November 2014].

USDA 2011, *Exporter Guide - Road Map to the German Market for U.S. Foods*. Available from: <[http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Exporter%20Guide\\_Berlin\\_Germany\\_8-31-2011.pdf](http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Exporter%20Guide_Berlin_Germany_8-31-2011.pdf)>. [25 November 2014].

USDA 2014, *Organic Agriculture*. Available from: <<http://www.usda.gov/wps/portal/usda/usdahome?contentidonly=true&contentid=organic-agriculture.html>>. [12 November 2014].

USDA - Animal and Plant Health Inspection Service 2014, *Permits and Certifications*. Available from: <<http://www.aphis.usda.gov/wps/portal/footer/topicsofinterest/applyingforpermit>>. [13 November 2014].

USDA - Agricultural Marketing Service 2012, *Grain Transportation Report*. Available from: <<http://www.ams.usda.gov/AMSV1.0/getfile?dDocName=STELPRDC5099908>>. [04 November 2014].

USDA - Foreign Agricultural Service 2011, *Organic Trade HS Codes*. Available from: <<http://www.fas.usda.gov/organic-trade-hs-codes>>. [14 October 2014].

USDA 2014, Feed and Grain Database - *Organic Prices*. Available from: <<http://www.ers.usda.gov/data-products/organic-prices.aspx>>. [18 November 2014].

USDA - Grain Inspection, Packers and Stockyards Administration, Federal Grain Inspection Service 2013, *Grain Inspection Handbook Book II, Chapter 8 Rye*. Available from: <<http://www.gipsa.usda.gov/publications/fgis/handbooks/grain-insp/grbook2/rye.pdf>>. [14 October 2014].

USDA - Natural Resources Conservation Service 2002, Plant Fact Sheet - Cereal Rye. Available from: <[http://plants.usda.gov/factsheet/pdf/fs\\_sece.pdf](http://plants.usda.gov/factsheet/pdf/fs_sece.pdf)>. [15 October 2014].

USDA Organic 2014, *Labeling Organic Distilled Spirits*: Available from: <<http://www.ttb.gov/pdf/organic-spirits.pdf>>. [27 November 2014].

USDA National Organic Program 2010, *Labeling Preamble*: Available from: <<http://www.ams.usda.gov/AMSV1.0/getfile?dDocName=STELDEV3003509&acct=noprulemaking>>. [28 November 2014].

USDA 2014, *Wheat Data Yearbook*. Available from: <[http://www.ers.usda.gov/datafiles/Wheat\\_Wheat\\_Data/Yearbook\\_Tables/US\\_Acreage\\_Production\\_Yield\\_and\\_Farm\\_Price/wheatyearbooktable02.htm](http://www.ers.usda.gov/datafiles/Wheat_Wheat_Data/Yearbook_Tables/US_Acreage_Production_Yield_and_Farm_Price/wheatyearbooktable02.htm)>. [2 December 2014].

Universal Lexikon Academic 2012, *Getreidehandel*. Available from: <[http://universal\\_lexikon.deacademic.com/166756/Getreidehandel](http://universal_lexikon.deacademic.com/166756/Getreidehandel)>. [28 November 2014].

University of California - Division of Agriculture and Natural Resources, *Cereal Rye*. Available from: <[http://ucanr.org/sites/asi/db/covercrops.cfm?crop\\_id=12](http://ucanr.org/sites/asi/db/covercrops.cfm?crop_id=12)>. [22 October 2014].

Vermarktungsgesellschaft Bio-Bauern mbH, 2014. Available from: <<http://www.bio-vg.de/>>. [17 November 2014].



Wagner, C 2013. *Food Packaging Regulations in the US*. Available from: <<http://www.foodpackagingforum.org/food-packaging-health/regulation-on-food-packaging/food-packaging-regulation-in-the-us>>. [07 November 2014].

Washington Trade Report 2012, Non-Tariff Barrier. Available from: <[http://www.washingtontradereport.com/dictionarym.htm#\\_Non-Tariff\\_Barrier\\_\(NTB\)](http://www.washingtontradereport.com/dictionarym.htm#_Non-Tariff_Barrier_(NTB))>. [01 November 2014].

Wiersma, J., Moncada, K., Brakke, M. n.d., *Small Grains. Risk Management Guide for Organic Producers*. Available from: <[http://www.organicriskmanagement.umn.edu/small\\_grains.pdf](http://www.organicriskmanagement.umn.edu/small_grains.pdf)>. [17 November 2014].

World Grain 2011, *Focus on Germany*. Available from: <<http://www.world-grain.com/Departments/Country%20Focus/Country%20Focus%20Home/Focus%20on%20Germany.aspx?cck=1>>. [17 November 2014].

Whole Grains Council 2003-2013, *Types of Rye*. Available from: <<http://wholegrainscouncil.org/whole-grains-101/types-of-rye>>. [22 October 2014].

Whole Grains Council 2003-2013, *Whole Grain Statistics*. Available from: <<http://wholegrainscouncil.org/newsroom/whole-grain-statistics>>. [08 November 2014].

Wirtschaftslexikon 24 n.d., *Agrarpreisschwankungen*. Available from: <<http://www.wirtschaftslexikon24.com/d/agrarpreisschwankungen/agrarpreisschwankungen.htm>>. [14 December 2014].

The World's Healthiest Foods 2001-2014, *Rye*. Available from: <<http://www.whfoods.com/genpage.php?tname=foodspice&dbid=65#nutritionalprofile>>. [01 November 2014].

World Population Review 2014, *Germany Population 2014*. Available from: <<http://worldpopulationreview.com/countries/germany-population/>>. [06 November 2014].

YCharts 2014, *US Rye Price Received*. Available from: <[http://ycharts.com/indicators/us\\_rye\\_price\\_received](http://ycharts.com/indicators/us_rye_price_received)>. [13 November 2014].

Zoll 2014, *Organic farming*. Available from: <[http://www.zoll.de/EN/Businesses/Movement-of-goods/Import/Restrictions/Goods/Food-and-feed-organic-farming/Organic-farming/organic-farming\\_node.html](http://www.zoll.de/EN/Businesses/Movement-of-goods/Import/Restrictions/Goods/Food-and-feed-organic-farming/Organic-farming/organic-farming_node.html)>. [14 November 2014].