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2015 Outlook of the U.S. and World Wheat Industries, 2015-2024

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ABSTRACT

This report evaluates the U.S. and world wheat markets for the 2015-2024 time period using the Global Wheat Policy Simulation Model. This analysis is based on a series of assumptions about general economic conditions, agricultural policies, weather conditions, and technological change.

Both the U.S. and world wheat economies are predicted to remain relatively healthy for the next ten years. World demand for both common and durum wheat are expected to remain strong. The high price levels in 2010, 2011 and early 2012 will not be maintained because they are the result of a small wheat crop in 2010 and 2012 in the Former Soviet Union (FSU) and Argentina in 2012. The lower price levels for all commodities will also impact the wheat market. It is expected that wheat production in the FSU will return to normal in the future. World trade volumes of both durum and common wheat are expected to expand, but trade volume of common wheat may grow faster than that of durum wheat.

Keywords: common wheat, durum wheat, production, exports, consumption, ending stocks

HIGHLIGHTS

Total world wheat trade is projected to increase by 12.4% from 122.1 million metric tons in 2014 to 137.2 million metric tons in 2024. It is expected that the average price of HRS wheat will be about \$6.50-\$6.70 range and durum wheat prices are expected to increase slowly to about \$8.00 in 2024.

Production of all wheat class in the United States is predicted to increase for the 2014-2024 period. The largest increase in production occurs for U.S. durum wheat, followed by SRW and white wheat. The U.S. export of durum wheat is predicted to increase for the 2014-2024 period. The United States is expected to continue to import durum wheat from Canada over the period.

Production of Canadian western red spring wheat (CWRS) is predicted to decline slightly while the production of Canadian western amber durum (CWAD) wheat is predicted to increase for the 2014-2024 period. CWRS wheat exports are projected to decrease slightly, while durum wheat exports increase by 6.4%.

Common and durum wheat production in the European Union (EU) is predicted to decrease by 1.9% and increase by 9.3%, respectively, for the 2014-2024 period. The EU is expected to increase its common wheat exports and return to exporting a small amount of durum wheat.

Australia's wheat production is predicted to grow by 13.8% over the 2014-2024 period. Wheat exports are expected to increase from 18.1 million metric tons in 2012-2014 to 20.6 billion metric tons in 2024.

Argentine wheat production is projected to increase by 23.6% to about 13.1 million metric tons in 2024. Wheat exports are expected to increase from 6.1 million metric tons in 2012-2014 to 6.6 million metric tons in 2024.

The FSU, China, and India were importers of wheat but have exported wheat during the past 10 years. Wheat production in India has increased 120% since the 1980s. Most of the increase has been due to increases in yields. China's wheat production reached a recent record level in 2012 and 2013 at 121 million metric tons. Production in the FSU remained below the 1980s until 2001 and 2002, when production increased 15% and 25%, respectively. Its production fell in 2003 before recovering in 2004. Russia is expected to export about 22.2 million metric tons of wheat by 2024 and Ukraine is expected to export about 14.8 million metric tons by 2024.

Most importing countries are predicted to increase their imports for both common and durum wheat. Among those countries, import demand for common wheat in Egypt, Brazil, and Algeria would grow faster than in other countries. Import demand for durum wheat in Algeria and Venezuela also are expected to be strong for the period. Asian imports, except for China, are expected to remain the same, although per capita consumption is falling.

2014 Outlook of the U.S. and World Wheat Industries, 2014-2023

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INTRODUCTION

This report evaluates the U.S. and world wheat industries for the 2014-2023 period by using the Global Wheat Policy Simulation Model developed by Benirschka and Koo. The model is operational at the Center for Agricultural Policy and Trade Studies, NDSU.

Wheat is a differentiated product. Substitution among wheat classes is imperfect, and consumer preferences differ among countries, suggesting that characteristics of different wheat classes are an important determinant of trade flows. The Global Wheat Policy Simulation Model is a partial equilibrium model that distinguishes wheat into common and durum wheat. U.S. common wheat is further divided into four classes: hard red winter (HRW), hard red spring (HRS), soft red winter (SRW), and white wheat.

Wheat is produced across the world. Total world wheat production has increased from 521 million tons in 1986/87 to 732 million tons in 2014. The EU (155 million tons) was the largest producer of wheat in 2014, followed by China (126 million tons) and the FSU (112 million tons). The United States produced 55 million tons of wheat in 2014, a decrease from 61 million tons in 2012. Other major wheat-producing countries are Canada, Australia, India, and Argentina. These countries produce about 79% of the total wheat produced in the world. Because of the concentration of wheat production in a few countries, a large volume of wheat is traded in the world market. The total quantity of wheat traded in the world market was 157 million tons in 2014, which is about 22% of wheat produced in that year. Major exporting countries are the United States, Canada, Australia, the EU, Russia, Ukraine, and Argentina.

The world wheat market has changed dramatically in the past decade. Farm support policies in exporting and importing countries have encouraged production. However, the overriding factor is the impacts of the bio-energy industry on all commodities. A significant increase in ethanol and bio-diesel production has resulted in increases in commodity prices. In addition, recent weather problems in various countries have resulted in decreases in production which has further impacted the wheat industry. As world trade decreased during the early 1980s due to a depressed world economy, major exporting countries expanded the use of export subsidies or export promotion programs to maintain their market shares.

The Uruguay Round of GATT negotiations, which became effective in 1995, have affected trade flows of wheat. The average export price of wheat at the Gulf ports decreased from \$5.02 per bushel in 1996/97 to \$3.30 per bushel in 2001/02; it increased to \$3.62 in 2003 due to weather conditions in the United States, Canada, and Australia, and then fell to \$3.24 in 2005. Prices increased during 2006 through 2008 for several reasons. First, world wheat production fell about 5% in 2006, and second, the increase in demand for corn in the United States pressured all commodity prices. Carryover stocks fell in 2007 to levels which have not occurred during the past 30 years. World stocks have fallen 46% since 2000 and 28% since 2004. However in 2008, world wheat production increased by 18% and carry-over stocks returned to normal levels. The price level in 2009 was similar to 2006 price levels. In 2010, the small wheat crop in the FSU decreased world supplies which was followed by price increases in 2010 to about \$6.85 per bushel. Even with a larger wheat crop in 2011, prices

increased to \$6.92/ bushel. In late 2012 wheat prices increased to about \$9.20/bushel before falling about \$1.00/bushel in 2013. By 2014 wheat prices fell to the \$6.00 range.

WORLD WHEAT INDUSTRY

World wheat trade is dominated by a few exporting countries: United States, Canada, Australia, EU, FSU, and Argentina. Even though exporting countries compete with each other, the world wheat market is not perfectly competitive. In the past, some countries have used state trading agencies to market their grain. In addition, countries use credit guarantees and others use preferential trade policies to promote their exports.

Wheat Classes

Wheat varieties are highly differentiated in terms of their agronomic and end-use attributes. Based on criteria such as kernel hardness, color, growth habitat, and protein content, wheat is divided into several classes. Color and hardness refer to physical properties of the wheat kernel. Based on the color of the outer layer of the kernel, common wheat varieties are described as white, amber, red, or dark, while the hardness of the kernel is used to characterize them as hard or soft. Most wheat varieties grown today belong to the broad category of common or bread wheat, which accounts for approximately 95% of world wheat production. The remaining 5% of world wheat production is durum wheat used to produce pasta and couscous.

Growth habitat is an important agronomic feature of wheat varieties. Winter wheat is planted in late summer or fall and requires a period of cold winter temperatures for heading to occur. After using fall moisture for germination, the plants remain in a vegetative phase or dormancy during the winter and resume growth in early spring. In contrast to winter wheat, spring wheat changes from vegetative growth to reproductive growth without exposure to cold temperatures. In temperate climates, spring wheat is sown in spring. Since yields tend to be higher for winter wheat than for spring wheat, spring wheat is produced primarily in regions where winter wheat production is infeasible, where frozen soil kills the wheat plants, or where winters are too warm. Countries with mild winters, such as Argentina and Brazil, produce spring wheat but plant in the fall rather than in the spring.

Wheat Production

Because of differences in soil types and climates, wheat produced in one country generally differs from that produced in other countries in terms of quality. The United States produces hard, soft, and durum wheat. Hard wheat produced in the United States is further divided into hard red winter (HRW) and hard red spring (HRS) wheat, and soft wheat is divided into soft red winter (SRW) and white wheat. SRW wheat is produced in the Corn Belt and Southern states. HRS and durum wheat are grown in the Northern Plains, mainly North Dakota, which produces about 80% of durum wheat and 50% of HRS wheat produced in the United States. HRW wheat is grown primarily in the Central Plains, mainly Kansas and Oklahoma. White wheat, a type of soft wheat, is grown in the Pacific Northwest, Michigan, and New York. Average U.S. wheat production for the 2010-2014 period was 57.8 million tons, with 23.3 million tons of HRW, 13.7 million tons of HRS, 11.6 million tons of SRW, 7.3 million tons of white wheat, and 1.9 million tons of durum wheat (Table 1).

Table 1. Wheat Production by Class, 2010 to 2014 (thousand tons)

Country/Class	2010	2011	2012	2013	2014	Average	Share
Argentina							
Common	17,200	15,500	9,300	10,500	12,000	12,900	1.9
Australia							
Common	27,410	27,410	29,905	22,461	26,500	25,737	3.9
Canada							
Total	23,300	25,288	27,205	37,530	29,300	28,524	4.2
Common	20,275	21,116	22,578	31,025	24,107	23,820	3.5
Durum	3,025	4,172	4,627	6,505	5,193	4,704	0.7
EU							
Total	136,667	137,182	143,513	143,118	155,505	143,397	20.9
Common	128,252	129,957	135,538	135,016	146,881	135,129	19.7
Durum	8,415	8,225	7,975	8,102	8,624	8,268	1.2
United States							
Total	60,068	54,249	61,304	58,111	55,135	57,773	8.4
HRW	27,716	21,308	27,162	20,342	20,085	23,323	3.4
HRS	15,514	10,783	13,703	13,354	15,121	13,695	2.0
SRW	6,462	12,323	11,234	15,473	12,392	11,577	1.7
White	7,488	8,555	6,986	7,363	6,091	7,297	1.1
Durum	2,887	1,280	2,218	1,578	1,445	1,882	0.3
Russia	48,870	56,240	37,720	52,091	59,000	50,784	7.4
Ukraine	16,844	22,324	15,761	22,278	24,500	20,341	3.0
Other Soviet	22,675	36,421	24,321	29,504	28,100	28,204	4.1
Sub Total	287,525	320,159	309,012	339,766	333,344	317,961	46.3
Total World							
Total	640,559	695,773	658,041	715,359	723,384	686,623	100.0

Source: USDA

The majority of Canadian wheat is produced in Saskatchewan, southwestern Manitoba, and southeastern Alberta. Canada primarily produces a hard red spring wheat (Canadian Western Red Spring (CWRS)) and durum wheat. Average Canadian wheat production for the 2010-2014 period included 23.8 million tons of CWRS and 4.7 million tons of durum wheat (Table 1).

The EU produced an annual average of 135.1 million tons of soft wheat and 8.3 million tons of durum wheat during the 2010-2014 time period. France accounted for 30% of soft wheat production in the EU in 2014. Germany and the United Kingdom are also major producers. The majority of durum is produced in Italy, Greece, and France. Italy accounted for nearly 58% of EU durum production in 2014, followed by Greece (21%) and France (12%).

Australia primarily produces a winter wheat which is similar to HRW wheat in terms of quality and characteristics. Australian average wheat production amounted to 25.7 million tons for the 2010-2014 period. Wheat production is concentrated in the eastern Australian states of New South Wales and Victoria. However, in 2013 Australia produced just 22.4 million tons of wheat compared to 29.9 million metric tons in 2012 and 27.4 million metric tons in 2011.

Argentina produces wheat with characteristics of both soft and hard wheat. Argentina's average wheat production amounted to 12.9 million tons for the 2010-2014 period. Argentina has had two small wheat harvests. In 2012, yields fell by 30% and in 2009 only 80% of the planted wheat was harvested. In 2014 Argentine wheat production increased about 14% from the 2013 level.

Table 2 shows the historical harvested area, yields, and production of the major wheat producing countries/regions in the world, by decades. Harvested wheat areas in India and Australia have increased 124% and 148% respectively, since the 1970s. Wheat area in the United States decreased by 8% and increased in Canada by 5%, from the 1970s level. World wheat harvested area increased about 5%.

Yields increased by 355% in China since the 1970s and by 159% in India. The EU had yield increases of 124%. The U.S. yields increased by 56%, while Canadian yields increased by 73%. The world wheat yield increased by 120% during the five decades.

The total wheat production in 2014 increased by 294% in India and by 276% in China compared to wheat production in the 1960s. The EU production increased by 214%, but a large share of that was due to the addition of countries to the EU. Argentina increased production by 204%. The United States and Canada increased production by 62% and 128%, respectively. Figure 1 shows the changing levels of production using an index where average production over the 1960-1969 time period equals 1.00.

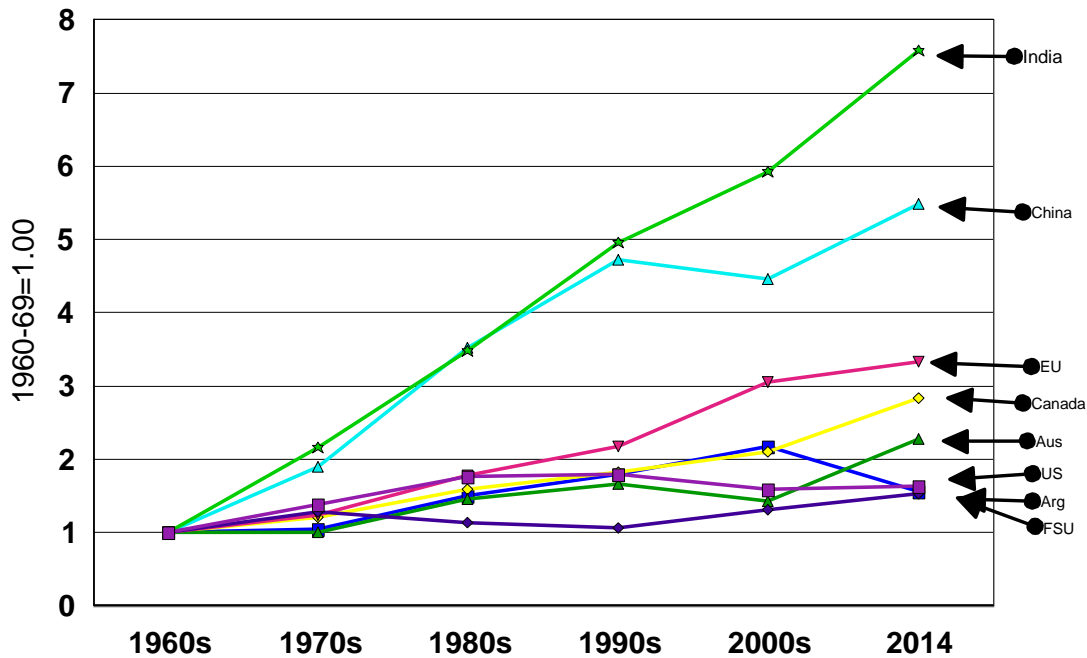


Figure 1. Changes in Wheat Production in Major Producing Countries/Regions

Table 2. Harvested Area, Yields, and Production for Major Wheat Producing Countries/Regions

	1970	1980	1990	2000	2010	2014	% Change
Harvested Area -----1,000 hectares-----							
Argentina	3,701	5,023	5,798	6,540	4,845	4,100	10.8
Australia	6,479	11,283	9,218	12,141	13,502	13,800	113.0
Canada	11,187	9,198	13,101	12,109	9,715	9,460	4.8
China	24,937	27,358	29,037	29,858	23,686	24,100	-17.4
EU	17,581	16,995	17,310	26,706	26,016	26,799	52.4
Russia			24,116	22,238	23,526	23,399	NA
Ukraine			6,591	6,064	5,862	6,300	NA
Other Soviet			16,338	15,043	16,696	16,940	NA
India	13,675	19,554	23,170	25,122	26,737	30,600	52.3
U.S.	20,324	22,286	26,493	24,829	20,403	18,770	-7.6
World	212,479	220,997	229,778	221,217	216,298	222,288	4.6
Yield -----metric tons/hectare-----							
Argentina	1.33	1.55	1.90	2.49	3.55	2.93	120.3
Australia	1.22	0.96	1.63	1.82	2.03	1.74	42.6
Canada	1.48	1.81	1.83	2.26	2.45	3.10	73.2
China	0.90	1.56	2.73	3.55	4.24	5.23	354.8
EU	2.59	3.97	5.15	4.97	5.25	5.81	124.3
Russia			1.77	1.70	2.04	2.23	NA
Ukraine			3.74	3.03	2.84	3.89	NA
Other Soviet			1.28	1.29	1.28	1.66	NA
India	0.90	1.36	1.85	2.44	2.73	3.13	158.7
U.S.	1.77	2.25	2.41	2.60	2.80	2.94	55.8
World	1.26	1.68	2.13	2.57	2.83	3.25	119.6
Production -----1,000 metric tons-----							
Argentina	4,922	7,786	11,016	16,285	17,200	12,000	144.1
Australia	7,904	10,832	15,025	22,097	27,409	26,500	203.8
Canada	16,153	16,626	24,073	27,415	23,764	29,300	81.6
China	22,492	42,718	79,238	106,119	100,504	126,000	275.5
EU	45,598	67,390	89,095	132,729	136,667	155,505	214.4
Russia			42,583	37,752	47,900	59,000	NA
Ukraine			24,785	18,347	16,656	24,500	NA
Other Soviet			17,573	16,255	25,268	28,100	NA
India	12,326	26,607	42,959	61,177	72,978	95,910	293.9
U.S.	36,795	64,798	74,292	60,641	60,062	55,135	43.9
World	267,528	371,075	489,283	568,283	611,744	723,384	129.7

Source: USDA

Wheat Consumption

Different wheat classes have been used for different purposes. Hard wheat flour has excellent bread baking properties; soft wheat flour is well-suited for cakes, cookies, and Asian noodles; and durum wheat is used for pasta products and couscous. However, since different types of wheat can be blended to produce flours with certain characteristics, some substitution among wheat classes is possible in flour milling.

Although wheat is used primarily for human consumption, it is also an excellent feed grain for poultry and livestock. Feed use of wheat tends to be highly variable and depends on the quality of the wheat crop and the price relationship between wheat and other feed grains. Generally, only lower quality wheat is used for feed, and different characteristics among wheat classes are not important for feeding purposes except for durum wheat which is not fed to livestock.

Wheat Trade

Major importing countries include China, Algeria, Brazil, Egypt, Japan, Mexico, Morocco, Nigeria, South Korea, Taiwan, and Tunisia (Table 3). Most of these importing countries use various types of barriers to restrict the inflow of wheat to their countries. Until 1995, China had been the largest importer of wheat, followed by Brazil and Japan. However, China’s wheat imports have been highly volatile, depending upon its domestic wheat production and import policies. China has reduced wheat imports substantially, and changed from importing 12.0 million tons in 1995 to importing 2.9 million metric tons of wheat in 2013 and 500 thousand metric tons in 2014. Its average import was 1.5 million metric ton for the 2010-2014 period.

The EU and United States are major exporters of wheat, but they also import considerable amounts of wheat. The United States imports wheat from Canada, while the EU imports wheat from the United States, Canada, Argentina, and Australia. The largest importer of wheat is Egypt, followed by Algeria, Brazil, and Japan (Table 3).

Table 3. Wheat Imports by Country, 2010 to 2014

Country	2010	2011	2012	2013	2014	Average	Share
	-----1,000 metric tons-----						%
Algeria	6,515	6,495	6,455	7,459	7,375	6,860	4.7
Brazil	4,159	5,302	5,774	6,966	6,000	5,640	3.8
China	-14	1,955	1,991	2,884	500	1,463	1.0
Egypt	10,375	11,418	8,103	9,961	9,750	9,921	6.7
Japan	5,301	6,354	6,598	6,123	6,000	6,075	4.1
Korea	4,636	5,057	5,295	4,144	3,650	4,556	3.1
Mexico	2,583	4,230	3,097	3,314	3,100	3,265	2.2
Morocco	3,847	3,543	3,597	3,677	2,750	3,483	2.4
Nigeria	3,482	3,451	3,890	4,050	4,150	3,805	2.6
Other	90,795	101,482	99,415	108,165	113,614	102,694	69.5
Total World	131,680	149,287	144,215	156,743	156,889	147,763	100.0

Source: USDA

The six major wheat exporting countries (United States, Canada, EU, FSU, Australia, and Argentina) supply approximately 61% of the wheat traded in the world market. Historically the United States has been the largest exporter, followed by Canada and the EU (Table 4), however the FSU was the largest exporter in 2008 and 2009. The United States leads in exports of HRW and SRW wheat; an average of 26.0 million metric tons of all wheat classes was exported annually from 2010 to 2014, of which 11.4 million metric tons were HRW and 5.9 million metric tons were HRS. The United States competes with the EU for market share of SRW wheat. Major U.S. and EU markets for SRW wheat include China, West Asia, and North Africa.

Canada is the leader in exports of hard spring wheat and durum wheat. The United States also exports HRS and durum wheat and competes with Canada. The EU competes with the United States and Canada for market share of durum wheat exports. Major U.S. markets for HRS wheat include Southeast Asia and East Asia, including Japan and South Korea. Major Canadian markets for HRS wheat include China and the East Asian markets. The United States, Canada, and the EU compete intensely for the North African durum markets.

Australia and Argentina compete with the United States in exporting HRW wheat. Major U.S. markets for HRW wheat include China and East Asia. Argentina exports HRW wheat mainly to South America and West Asia. Australia's major markets are the North African countries, China, and West Asia.

Table 4. Wheat Exports by Class, 2010 to 2014

Country	2010	2011	2012	2013	2014	Average	Share
	-----1,000 metric tons-----						%
Argentina/Common	9,482	12,922	3,548	2,180	5,995	6,825	4.5
Australia/Common	18,479	24,533	18,513	18,471	17,350	19,469	12.9
Canada							
All	16,131	16,864	18,487	22,792	22,520	19,359	12.8
Common	12,865	13,272	14,256	17,937	17,720	15,210	10.1
Durum	3,266	3,592	4,231	4,855	4,800	4,149	2.8
EU							
All	18,463	9,360	17,400	27,943	24,500	19,533	13.0
Common	17,963	9,669	18,175	28,843	25,350	20,000	13.3
Durum	500	-309	-775	-900	-850	-467	NA
United States							
All	32,501	25,572	24,233	27,438	20,278	26,005	17.3
HRW	16,769	10,793	9,916	11,625	8,002	11,421	7.6
HRS	8,492	5,661	5,144	4,573	5,580	5,890	3.9
SRW	2,177	3,620	4,790	7,131	3,811	4,306	2.9
White	4,763	5,743	4,573	4,464	3,838	4,676	3.1
Durum	299	-245	-191	-345	-953	-289	NA
Russia	3,959	21,077	10,117	17,734	19,800	14,537	9.6
Ukraine	3,894	5,352	7,145	9,687	10,950	7,406	4.9
Other Soviet	213	5,289	885	2,294	-295	1,677	1.1
Other Producers							
All	29,681	37,282	37,033	37,293	38,096	35,877	23.8
Total World							
All	132,803	158,251	137,361	165,832	159,194	150,688	100.0

Source: USDA

RECENT CHANGES IN U.S. WHEAT PRICES

Figure 2 shows the recent price trend for U.S. wheat. The price levels have varied from a high of \$9.97 per bushel in 2007 for durum wheat to a low of \$2.20 per bushel for SRW wheat in 2000. The prices for all of the wheat classes have recovered from the lows in 1998-1999 to the \$3.25 to \$4.20 range during the 2002 to 2005 time period, followed by a large price increase in 2006, 2007 and 2008 and 2011 and 2012 but falling in 2009, 2013 and 2014. Prices respond to changes in supply and demand; and/or major changes or shocks in the world wheat industry.

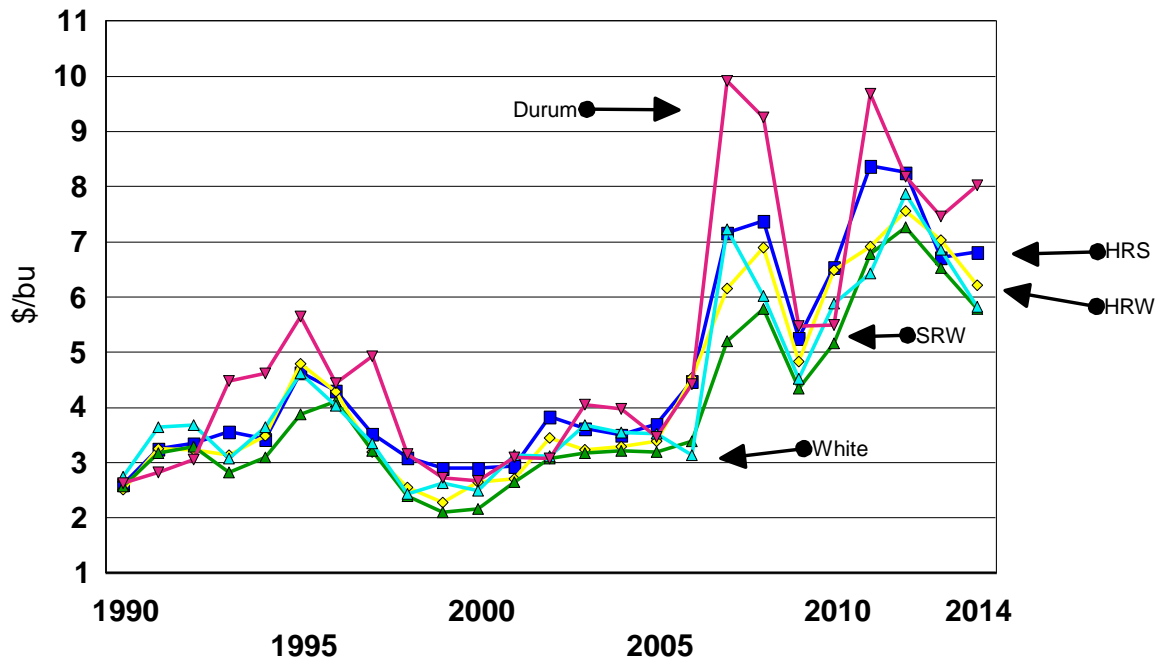


Figure 2. Historical Farm Price by Class, 1990-2014

OUTLOOK FOR THE WORLD WHEAT INDUSTRY

The Global Wheat Policy Simulation Model is used to analyze the U.S. and World wheat industries for the 2015-2024 period. The outlook projection is based on an assumption that current farm and trade policies adopted by wheat exporting and importing countries will remain unchanged. Assumptions associated with macroeconomic variables, such as GDP growth rates, interest rates, inflation rates, exchange rates, and consumer price indices in the United States and other countries, are based on projections prepared by Global Insight. Average weather conditions, historical rates of technological change, and current policies are also assumed to prevail during the projection period.

The model contains eight exporting countries and regions [Argentina, Australia, Canada, the United States, the European Union (EU), Russia, Ukraine, and Other Soviet Union (OSU)] and 12 importing countries and regions [Algeria, Brazil, Egypt, Japan, Mexico, Morocco, Nigeria, South Korea, Taiwan, Tunisia, Venezuela, and a Rest of the World region]. India and China have been both exporters and importers in recent years. The model forecast production, consumption, stocks, and exports or imports for wheat classes over a ten-year period. The model is solved for a set of

equilibrium wheat prices in which demand for each wheat class equals supply for every year. The model used the predicted prices of all agricultural commodities, except wheat, from UDSA long range price forecasts. The model uses 2013 as the base year of the simulation.

Total world wheat trade for the eight major exporting countries/regions is projected to increase by 11.7% from 122.1 million metric tons in 2014 to 137.2 million metric tons in 2024. Trade of all wheat classes is expected to increase for the 2014-2024 period. HRS wheat production is predicted to increase in the U.S. faster than in other wheat class as farmers respond to lower corn and soybean prices.

United States

Figure 3 shows the projected prices for the various classes of wheat. The prices of common wheat classes are expected to fall about \$1.00 below the 2013 level before increasing about \$0.50 by 2024. The prices of HRS wheat are projected to increase from \$5.88 in 2015 to about \$6.68 per bushel by 2024. Durum wheat is expected to rise from the \$7.48 range in 2015 to about \$8.02 per bushel in 2024.

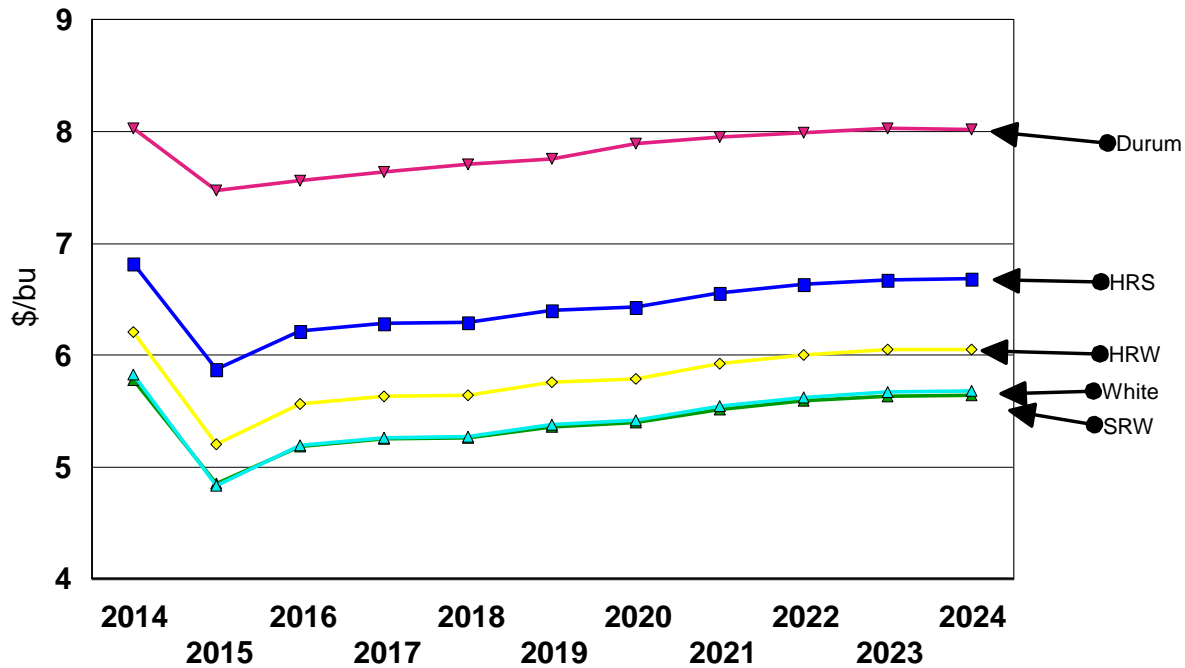


Figure 3. Projected U.S. Farm Wheat Price, by Class, 2014-2024

Table 5 shows wheat production, consumption, exports, and ending stocks in the United States. By 2024, total U.S. common wheat production is expected to grow by 7.0% above the 2012-2014 average, but is much lower than production during the late 1990s. The largest increase in production occurs for durum wheat (49.7%) followed by SRW wheat (12.2%). Production of HRS wheat is expected to increase by 5.8%. Changes in production of different classes of wheat over the 2014-2024 average are shown in Figure 4.

Table 5. Wheat Production, Consumption, Exports, and Carry-over Stocks in the United States

	Average (2012-2014)	2014	2024	% Change from the average to 2024
-----1,000 metric tons-----				
<u>Production</u>				
Common	56,436	53,690	60,393	7.0
HRW	22,530	20,085	23,846	5.8
HRS	14,059	15,121	14,596	3.8
SRW	13,033	12,392	14,624	12.2
White	6,813	6,091	7,328	7.5
Durum	1,747	1,445	2,615	49.7
<u>Consumption</u>				
Common	32,349	29,844	31,611	-2.3
Durum	2,373	2,383	2,484	4.7
<u>Exports</u>				
Common	25,313	21,230	28,581	12.9
Durum	(499)	(953)	116	NA
<u>Carry-over</u>				
Common	17,492	18,100	18,894	8.0
Durum	608	599	673	10.6

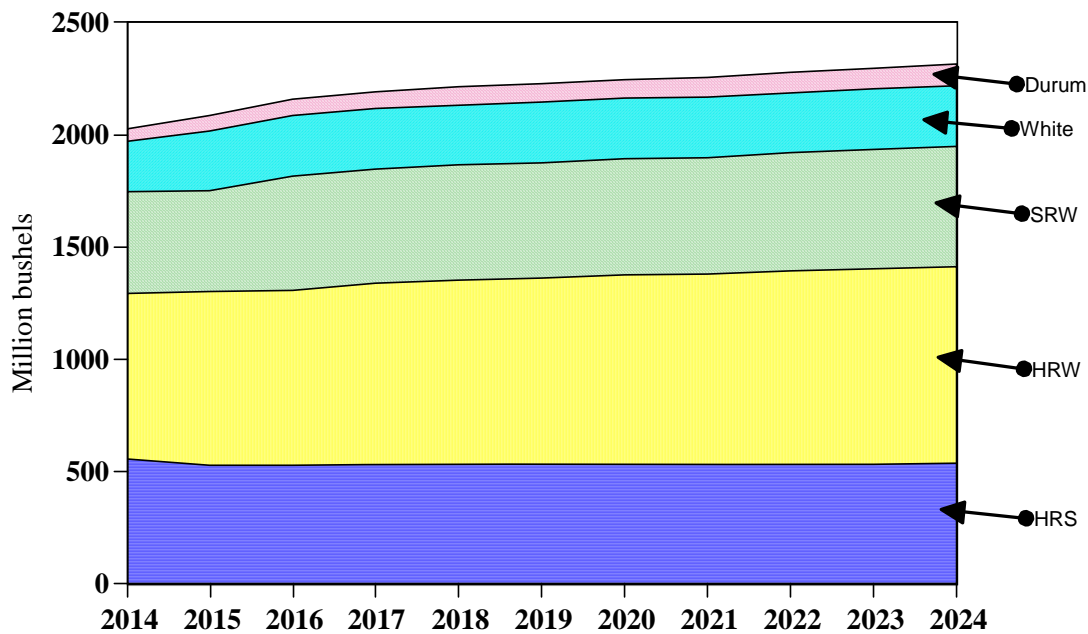


Figure 4. U.S. Wheat Production by Class, 2014-2024

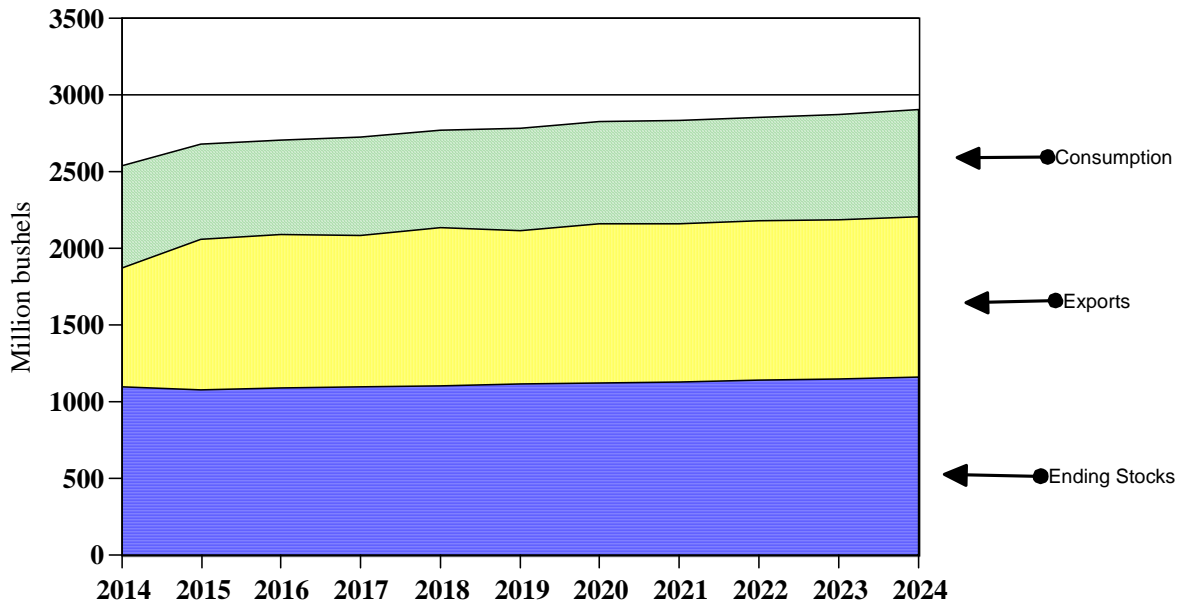


Figure 5. U.S. Common Wheat Utilization, 2014-2024

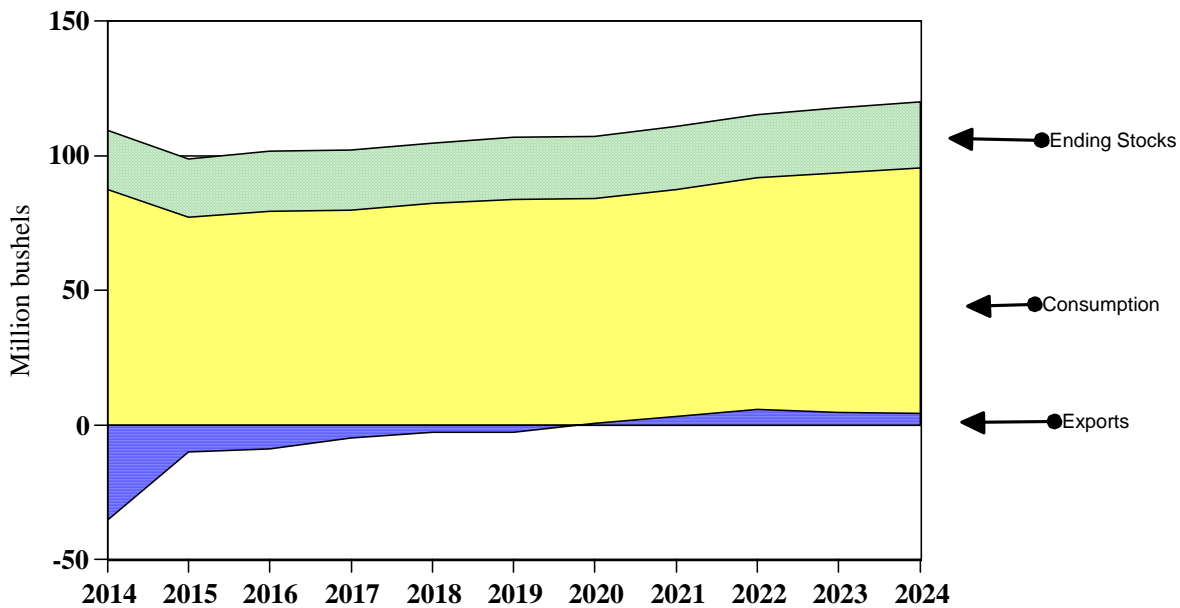


Figure 6. U.S. Durum Wheat Utilization, 2014-2024

The increased wheat production in the United States is due to increases in both harvested acres and yields. Total wheat harvested area is expected to increase slowly from 46.4 million acres for the 2012-2014 average and 48.7 million acres in 2024, and average yield is predicted to increase from 43.7 bushels per acre to 47.6 bushels per acre over the 2014-2024 period. U.S. durum area is expected to increase 67% for the same time period because farmers are expected to return to a more traditional crop mix.

Common wheat consumption is expected to fall slightly compared to durum wheat consumption. U.S. wheat consumption is projected to increase 2.3% for common wheat (Figure 5) and increase by 4.7% for U.S. durum wheat for the 2014-2024 time period (Figure 6).

The United States is expected to be net importer of durum wheat until 2020 when the United States is expected to export a small amount of durum (Table 5). Common wheat exports are predicted to increase from 25.3 million metric tons in 2012-2014 to 28.6 million metric tons in 2024. Ending stocks are expected to increase by 8.0% for common wheat compared to the 2012-2014 average and 10.6% for durum wheat (Table 5).

Canada

CWRS wheat production is predicted to decrease by 0.1% and increase by 7.5% for CWAD, from the 2012-2014 average (Table 6). Total area for CWRS wheat is expected to decrease slightly between 2014 and 2024, while CWAD wheat area is expected to increase from 1.9 million acres in 2014 to 2.1 million acres in 2024.

Domestic consumption of CWRS wheat is predicted to increase by 7.8%, while the consumption of durum wheat is expected to increase by 3.0% over the 2014-2024 period. Canadian CWRS wheat exports are projected to decrease by 3.5% by 2024, and CWAD wheat exports are predicted to increase by 6.4% from 4.6 million metric tons to 4.9 million metric tons in 2024. Ending stocks are predicted to increase by 1.5% for CWRS wheat and decrease 9.4% for CWAD wheat over the 2014-2024 period. During the preceding years, 2000-2005, ending stocks of CWAD in Canada were between 1 million and 2.8 million metric tons.

Table 6. Wheat Production, Consumption, Exports, and Carry-over Stocks in Canada

	Average (2012-2014)	2014	2024	% Change (2012-14) to 2024
<u>Production</u>	-----1,000 metric tons-----			
WRS	25,903	24,107	25,880	-0.1
WAD	5,442	5,193	5,849	7.5
<u>Consumption</u>				
WRS	9,078	9,400	9,787	7.8
WAD	896	930	923	3.0
<u>Exports</u>				
WRS	16,638	17,720	16,049	-3.5
WAD	4,629	4,800	4,923	6.4
<u>Carry-over</u>				
WRS	5,631	4,969	5,713	1.5
WAD	1,400	1,276	1,268	-9.4

Figure 7 shows changes in consumption, exports, and ending stocks of CWRS wheat in Canada from 2014 to 2024, and Figure 8 shows the utilization for CWAD wheat.

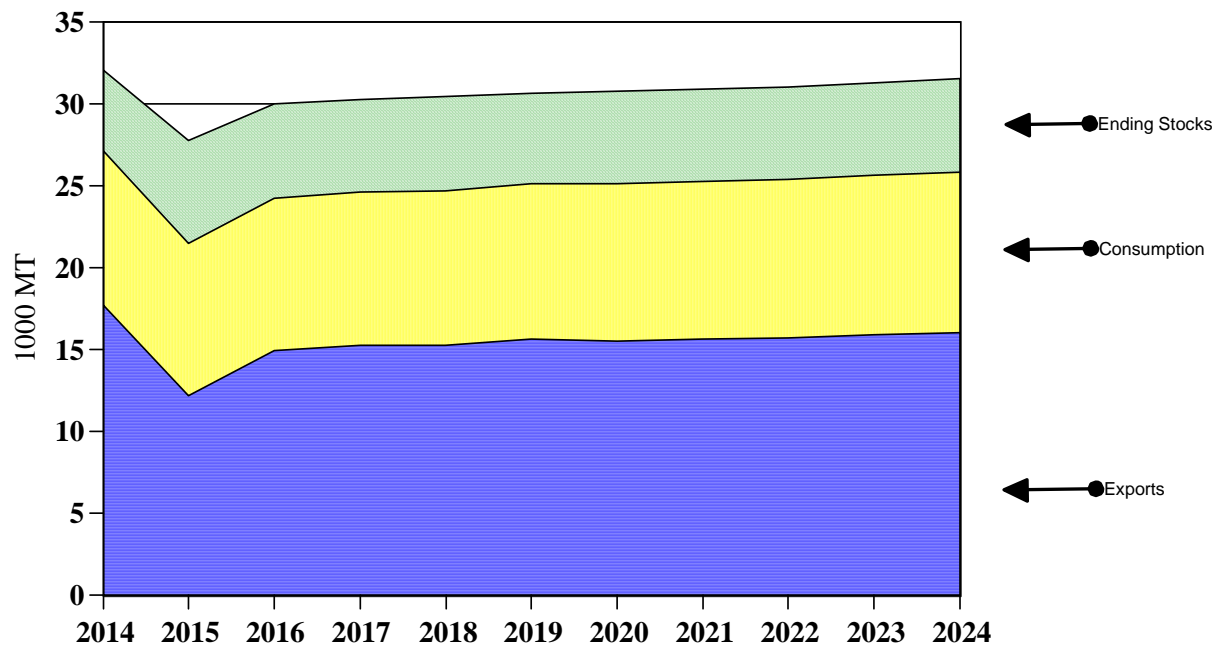


Figure 7. Canadian Western Red Spring Wheat Utilization, 2014-2024

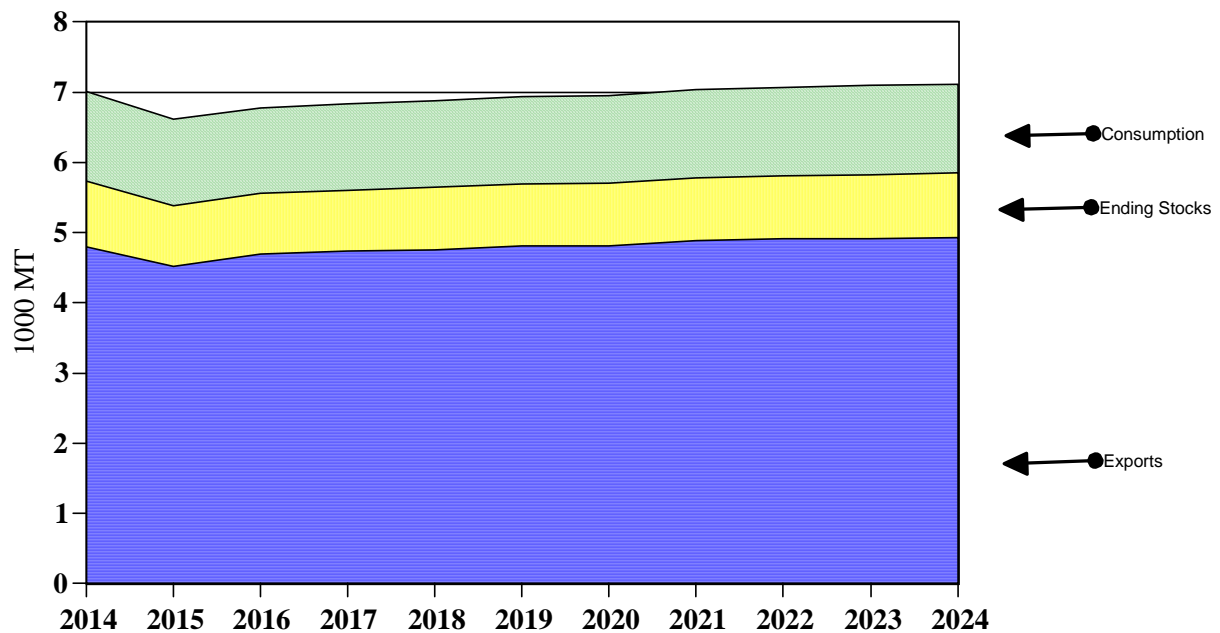


Figure 8. Canadian Western Amber Durum Wheat Utilization, 2014-2024

European Union

Table 7 presents production, consumption, exports, and ending stocks of common and durum wheat in the EU for the 2014-2024 period. Common wheat production in the EU is predicted to decrease by 1.9% from the 2012-2014 average by 2024, while durum wheat production is expected to increase by 9.3% for the same time period.

Domestic consumption of common wheat is projected to increase by 4.2%, and consumption of durum wheat is predicted to increase by 0.2% for the 2014-2024 period. Exports of common wheat in 2024 are predicted to decrease 14.8% from the 2012-2014 averages. Ending stocks are expected to decrease for both common and durum wheat.

Table 7. Wheat Production, Consumption, Exports, and Carry-over Stocks in the European Union

	Average (2012-2014)	2014	2024	% Change (2012-14) to 2024
<u>Production</u>				
-----1,000 metric tons-----				
Common	139,145	146,881	136,440	-1.9
Durum	8,234	8,624	8,996	9.3
<u>Consumption</u>				
Common	111,067	115,600	115,783	4.2
Durum	8,767	8,900	8,782	0.2
<u>Exports</u>				
Common	24,123	25,350	20,549	-14.8
Durum	-842	-850	274	NA
<u>Carry-over</u>				
Common	11,748	15,940	10,861	-7.6
Durum	1,115	1,200	922	-17.2

Figures 9 and 10 show changes in consumption, exports, and ending stocks of common and durum wheat for the 2014-2024 period. Common and durum wheat consumption are expected to increase slightly.

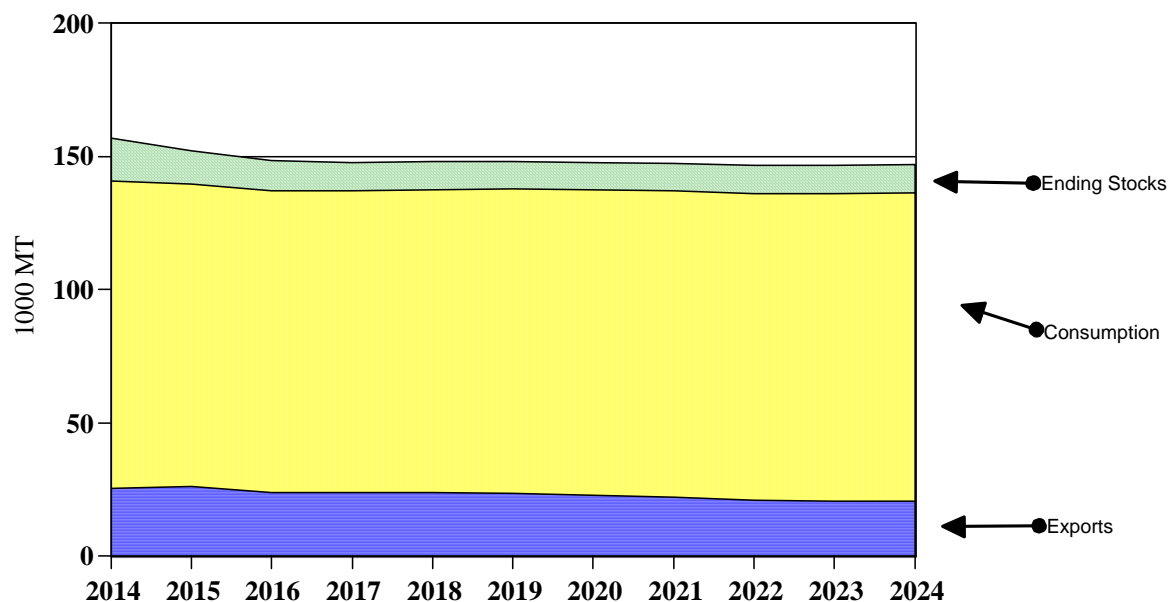


Figure 9. EU Common Wheat Utilization, 2014-2024

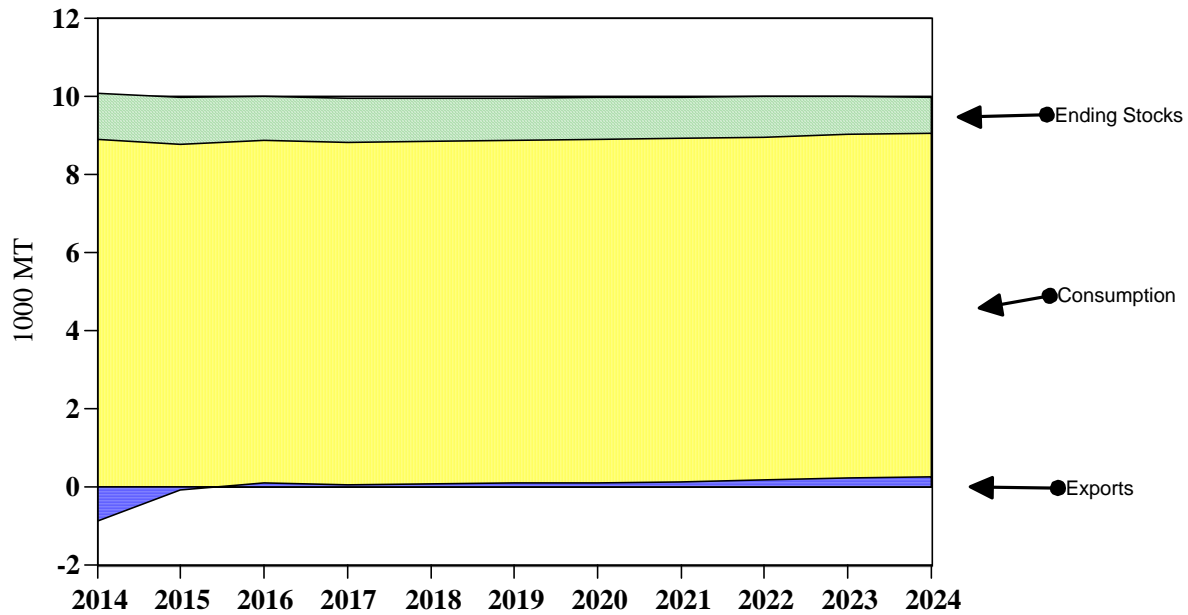


Figure 10. EU Durum Wheat Utilization, 2014-2024

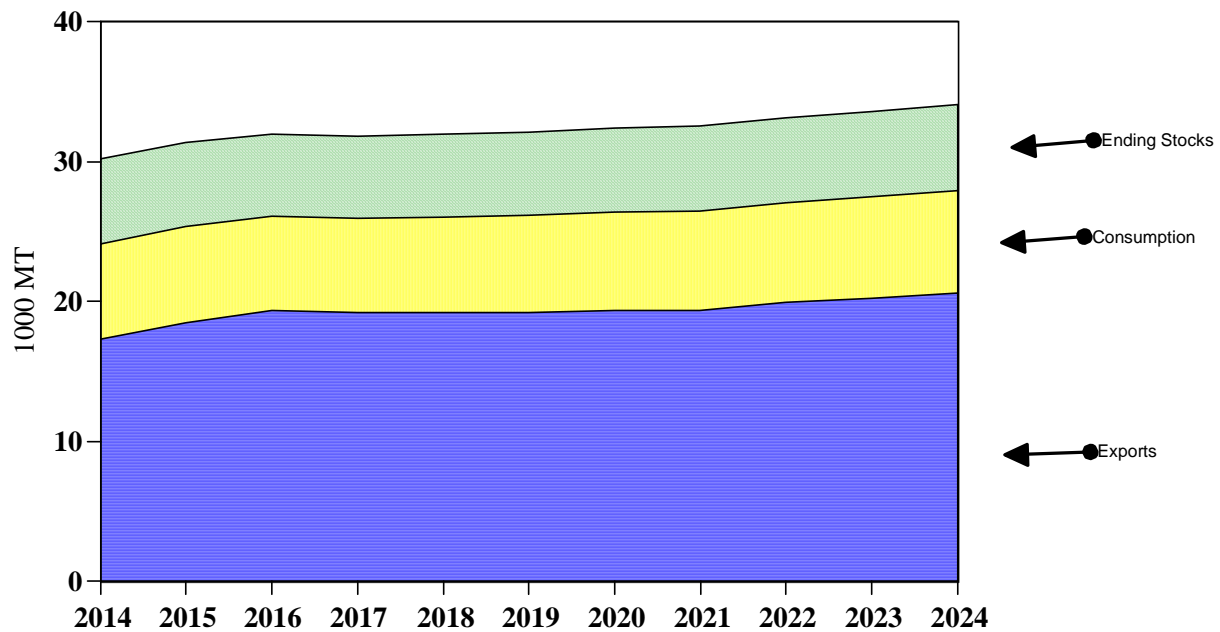


Figure 11. Australian Common Wheat Utilization, 2014-2024

Australia

Compared to the 2012-2014 average, Australian wheat production is projected to grow by 13.8% in 2024 (Table 8). Much of that increase is due to the small crop in 2012 due mainly to weather. Yields are expected to increase gradually at the historical trend line, while wheat area also is expected to increase slightly. Domestic wheat consumption is predicted to increase by 7.2% from the 2012-2014 average of 6.8 million metric tons to 7.3 million metric tons in 2024. Wheat consumption in Australia during the poor harvests in 2010 and 2012 decreased 24% compared to the long term

average. Wheat exports also are predicted to increase from the 2012-2014 average of 18.1 million metric tons to 20.6 million metric tons in 2024. Figure 11 shows changes in consumption, exports, and ending stocks for the 2014-2024 period. The single desk exporting powers of the Australian Wheat Board were removed in July of 2008. The Wheat Exports Australia (WEA) has taken over the responsibility.

Table 8. Wheat Production, Consumption, Exports, and Carry-over Stocks in Australia, (1,000 metric tons)

	Average	2014	2024	% Change (2012-14)
	(2012-2014)			to 2024
Production	24,622	24,000	28,022	13.8
Consumption	6,830	6,800	7,323	7.2
Exports	18,111	17,350	20,647	14.0
Carry-over	5,663	6,092	6,154	8.7

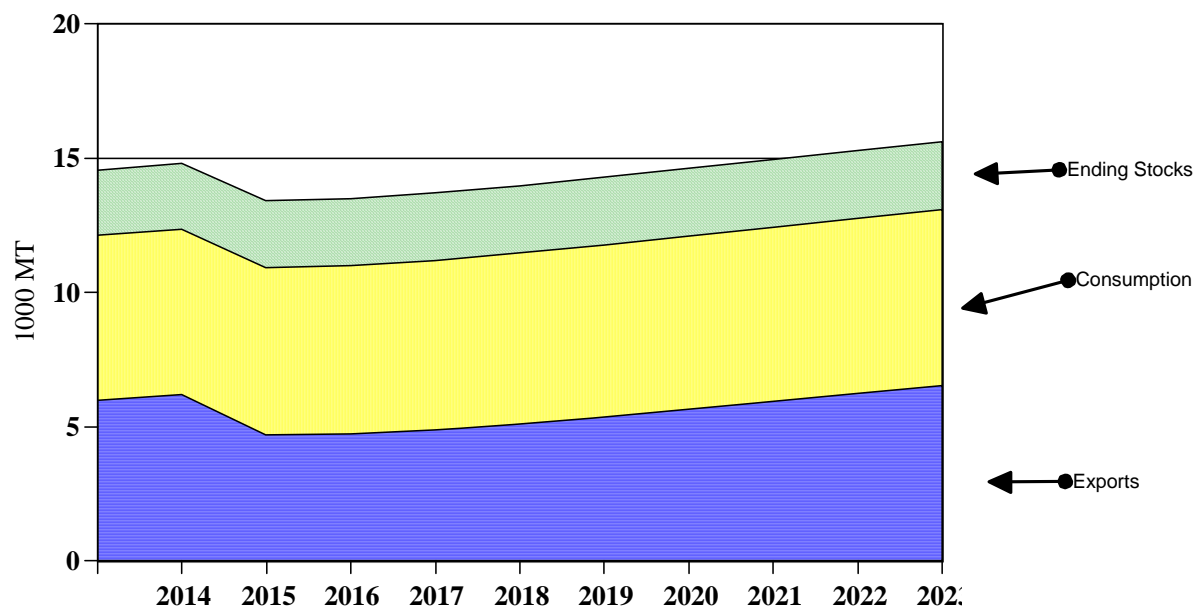


Figure 12. Argentine Common Wheat Utilization, 2014-2024

Argentina

Argentine wheat production is projected to increase by 23.6% from the 2012-2014 average of 10.6 million metric tons to 13.1 million metric tons in 2024 (Table 9). Domestic wheat consumption is expected to increase by 7.0% from 6.1 million metric tons to 6.6 million metric tons. Wheat exports are predicted to be 6.5 million metric tons in 2024, which is a 67.3% increase from the 2012-2014 average. The reason for the large increases in both production and exports is that Argentina experienced small crops in both 2012 and 2013. Ending stocks are expected to increase by 9.9%. Figure 12 shows changes in consumption, exports, and ending stocks for the 2014-2024 period.

Table 9. Wheat Production, Consumption, Exports, and Carry-over Stocks in Argentina

	Average (2012-2014)	2014	2024	% Change (2012-14) to 2024
	-----1,000 metric tons-----			
Production	10,600	12,000	13,105	23.6
Consumption	6,133	6,150	6,564	7.0
Exports	3,908	5,995	6,536	67.3
Carry-over	2,309	2,411	2,537	9.9

Former Soviet Union Countries

Russia exported an average of 15.9 million metric tons of wheat during the 2012-2014 time period. Russia is expected to increase exports to 22.2 million metric tons by 2024. Ukraine exported 9.3 million metric tons of wheat during 2012-2014 and is expected to increase exports to 14.8 million metric tons by 2024. The other former Soviet Republics imported less than 1 million metric tons during 2012-2014 and are expected to import about 3 million metric tons in 2024.

Table 10. Wheat Production and Exports in Russia, Ukraine and Other Former Soviet Union States

	Average (2012-2014)	2014	2024	% Change (2012-14) to 2024
	-----1,000 metric tons-----			%
<u>Russia</u>				
Production	49,603	59,000	58,435	17.8
Exports	15,883	19,800	22,223	39.9
<u>Ukraine</u>				
Production	20,846	24,500	26,290	26.1
Exports	9,260	10,950	14,751	59.3
<u>Other Soviet Union</u>				
Production	34,227	28,100	32,041	17.3
Exports	<u>-961</u>	<u>295</u>	<u>-2,990</u>	<u>NA</u>

IMPORTING COUNTRIES

Importing countries are grouped into the Asian (China, Japan, Korea, and Taiwan), North Africa (Algeria, Egypt, Morocco, and Tunisia), Nigeria, and Latin American (Mexico, Brazil, and Venezuela) regions (Table 11).

Table 11. Imports of Common and Durum Wheat by Major Importing Countries

	Average (2012-2014)	2014	2024	% Change (2012- 14) to 2024
	-----1,000 metric tons-----			%
<u>Asia</u>				
China	1,792	500	2,231	24.5
S. Korea	4,363	3,650	3,930	-9.9
Japan	6,240	6,000	5,750	-7.8
Taiwan	1,349	1,350	1,383	2.5
<u>North Africa</u>				
Algeria				
Common	5,053	5,171	6,045	19.6
Durum	2,043	2,204	2,551	24.9
Morocco	3,136	2,750	3,584	14.3
Egypt	9,271	9,750	12,270	32.3
Tunisia				
Common	972	943	1,074	10.6
Durum	575	557	655	13.8
<u>Nigeria</u>	4,030	4,150	5,518	36.8
<u>Latin America</u>				
Brazil	6,247	6,000	7,117	13.9
Mexico	3,170	3,100	4,146	30.8
Venezuela				
Common	1,254	1,274	1,476	17.7
Durum	535	526	622	16.2

Asian Importers

Imports by Japan are projected to decrease by 7.8% over the 2014-2024 period because of population decreases (Figure 13), and Korean imports are projected to decrease by 9.9% because of large Korean imports in 2012. Japan's population is stable and the per capita consumption of wheat is slowly decreasing, resulting in a slight reduction in the demand for wheat in Japan. China imported 1.8 million metric tons of wheat annually during 2012-2014. China is projected to continue to import wheat in 2024. As China's income continues to increase, per capital consumption of wheat is expected to decrease for the time period. In the past, China has imported between 3% and 5% of its domestic demand. In the future the model expects that China will import between 2% and 3% of its domestic demand. The model projects that harvested area remains relatively constant. However, total production is projected to increase when combined with yield increases. Chinese per capita wheat consumption is falling slowly, due to higher incomes, but China's wheat imports will remain at approximately 2.2 million metric tons because of expected increase in its population. Taiwan is expected to increase wheat imports by 2.5% by 2024.

African Importers

North African imports of wheat are projected to increase by 24.4% from the 2012-2014 average to 2024. Egyptian imports of common wheat are projected to increase by 32.3%, from 9.3 million metric tons in 2012-2014 to 12.3 million metric tons in 2024. The increase in Egyptian imports is due to the population growth in the country and small imports in 2012. Algeria is expected to import both common and durum wheat. Algerian imports of common wheat are projected to increase by 19.6% from the 2012-2014 average to 6.0 million metric tons in 2024, and durum wheat imports are projected to increase by 24.9%, from 2.0 million metric tons to 2.6 million metric tons. Morocco's imports of common wheat are projected to increase by 14.3% between the 2012-2014 average and 2024. Morocco's imports are very erratic, depending on its unstable domestic production. Tunisian imports of common wheat are projected to increase by 10.6%, between the 2012-2014 average and 2024. Its durum wheat imports are projected to increase by 13.8% from the 2012-2014 average to 2024 (Figure 18). Nigeria is expected to increase imports from 4 million metric tons in 2012-2014 to 5.5 million metric tons in 2024.

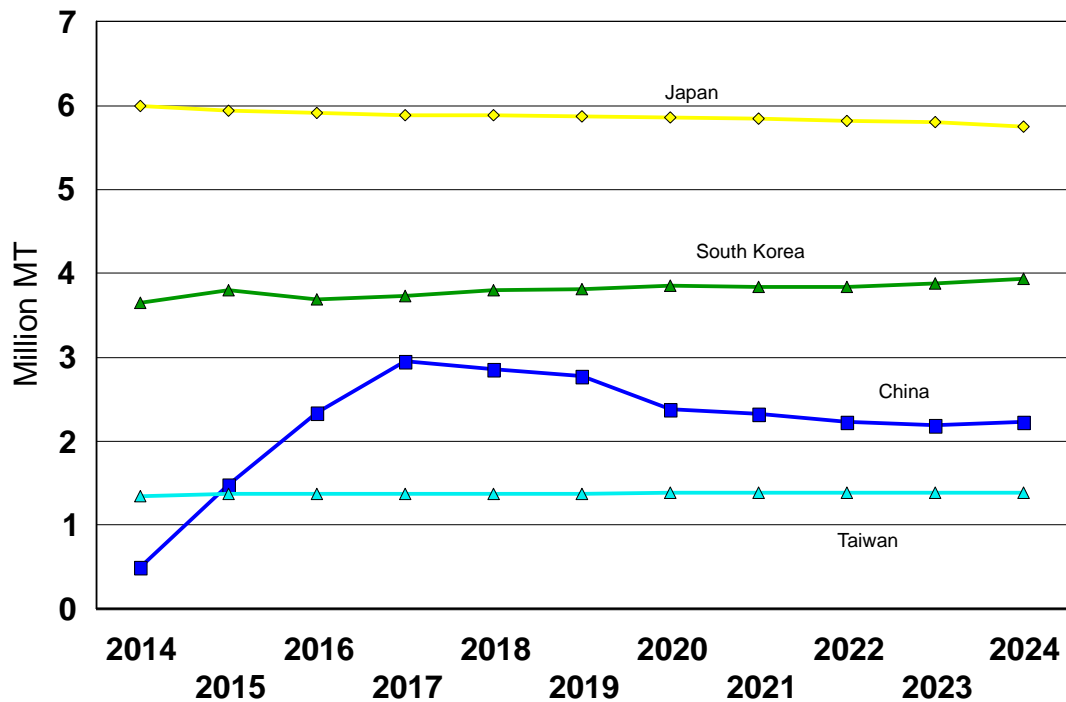


Figure 13. Common Wheat Imports by Major Asian Countries, 2014-2024

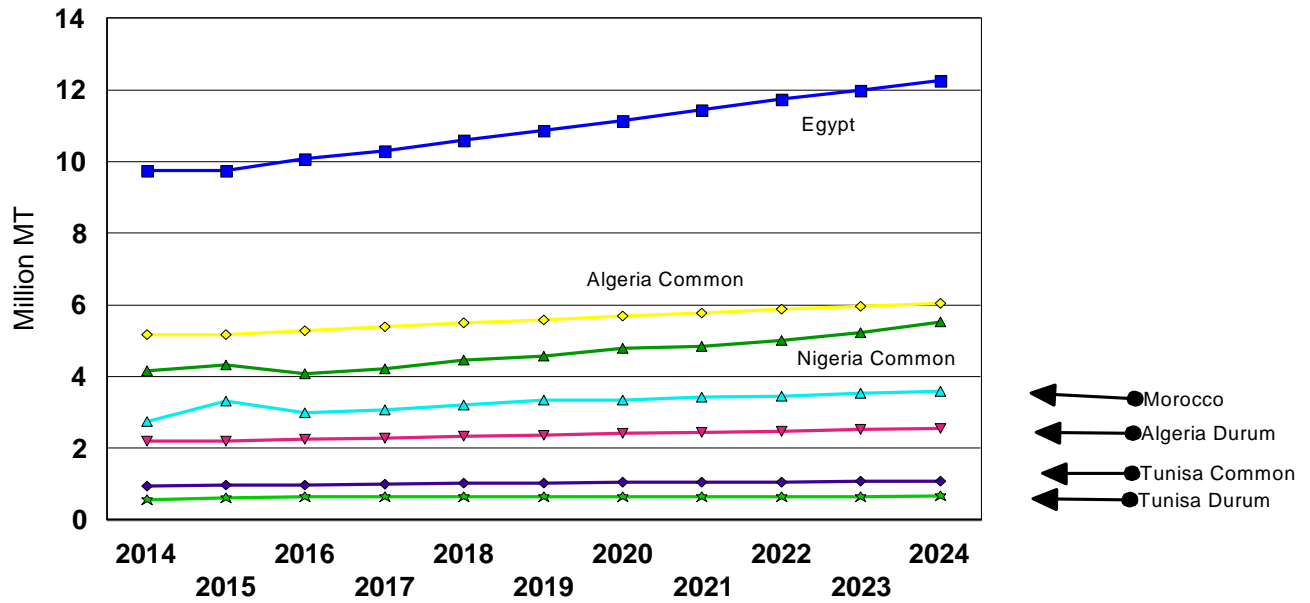


Figure 14. Common and Durum Wheat Imports by Major African Countries, 2014-2024

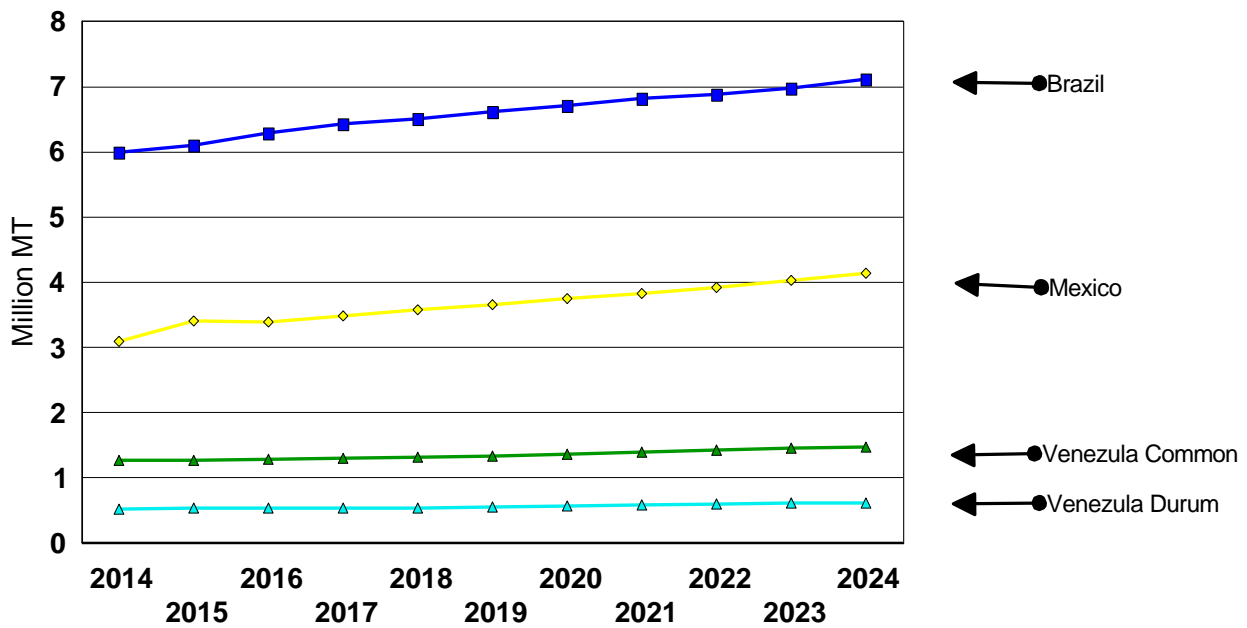


Figure 15. Common and Durum Wheat Imports by Latin American Countries, 2014-2024

Latin America Importers

Mexican imports are projected to increase by 30.8% from the 2012-2014 average of 3.2 million metric tons to 4.1 million metric tons by 2024. Venezuela is expected to import more common and durum wheat. Common wheat imports in Venezuela are projected to increase by 17.7% from 1.3 million metric tons for the 2012-2014 average to 1.5 million metric tons in 2024, and durum wheat

imports are projected to increase by 16.2% (Figure 15). Brazilian imports are projected to increase to 7.1 million metric tons by 2024, which is a 13.9% increase from the 2012-2014 average. The Latin American wheat market will grow slower than the African market, and the African market is almost twice as large. Latin America will continue to be an important market for the U.S. wheat industry, but the U.S. must compete with Argentina to maintain or capture its market share in the region.

CONCLUDING REMARKS

This report evaluates the U.S. and world wheat industries for the 2014-2024 period using the Global Wheat Policy Simulation Model, which is operational at the Center for Agricultural Policy and Trade Studies, North Dakota State University. The projections are based on a series of assumptions about the general economy, agricultural policies, normal weather conditions, and technological changes. The projections, therefore, could change significantly, depending upon changes in assumptions.

Import demand for both common and durum wheat is largely based on optimistic income growth for the year 2015-2023 (2.5% to 6% annually) in developing and developed countries. However, if the predicted income growth is not realized, import demand could grow slower than predicted and estimated prices could be lower.

Prices for common wheat in the near future are predicted to be slightly higher than the 2014 levels. It is expected that the average price of wheat could return to \$6.50-\$6.70 range for HRS wheat and \$8.00 per bushel for durum wheat by 2024.

World wheat exports by the eight major exporters are projected to increase by 13.3% from 121.1 million metric tons in 2014 to 137.2 million metric tons in 2024. Durum wheat trade is expected to grow slower than common wheat trade. North Africa continues to be the growth market for wheat exports. However the impacts of the recent unrest in North Africa may be negative to United States wheat exports. Per capita consumption of wheat has increased in most Asian countries, except for Japan, South Korea and China. Wheat imports could increase in Latin America, but most of those might be supplied by Argentina.

The United States, Russia, Ukraine, and Australia are predicted to increase their production of common wheat for the 2014-2024 period. Exports of durum wheat are expected to increase for all exporting countries/regions including the United States. Consumption of common wheat is expected to increase slowly in most developed countries and will increase faster in North Africa and Latin America. Production and exports of common wheat in the EU are predicted to increase slowly during the projection period due to changes in the Common Agricultural Policy.

Common wheat demand in Southeast Asian countries is predicted to grow slowly for the 2014-2024 period. Over the past 10 years, India has been either a net importer or net exporter of wheat, depending on its production and carry-over stocks. India exported an average of 5.4 million metric tons of wheat during 2012-2014. India could import about 2.5 million metric tons per year in the future.

Chinese wheat production is expected to be 125.2 million metric tons in 2024 which is about the same as in 2014. In China, yields have been increasing, but area harvested is decreasing. China's long term supply and demand situation for wheat is uncertain. Rapid increases in incomes have

reduced per capita consumption of cereal grains in favor of fruits, vegetables and meat. This may reduce Chinese wheat imports.

Egypt, the largest importer of common wheat in the North Africa region, is predicted to increase its imports of common wheat. Import demand for both common and durum wheat in other countries in the region is also expected to increase.

Import demand for common wheat in Venezuela is expected to be strong for the 2014-2024 period. Import demand for common wheat in Mexico also is predicted to be strong for the projection period.

Import demand for wheat in North Africa could grow faster than that in Asia and Latin America for the next ten years. However, the competition among wheat exporting countries in the markets could remain strong: The United States could compete with Canada, the FSU, and the EU in the African market, with Canada and Argentina in the Latin American market, and with Canada and Australia in the Asian market.

There are a few variables, which might affect the U.S. and world wheat industries. First, a rise in protectionism stemming from high commodity prices in 2008 and 2010 in some developing countries could continue to affect the price of wheat and trade volume into the future. Secondly, per capita consumption of wheat in some Asian countries, including China, South Korea, and Japan is expected to decrease. If this trend continues, total consumption of wheat may decrease in South Korea and Japan and consequently their imports will also decrease. However, China's imports increase because of expected increase in population.

References

- Benirschka, Martin, and Won W. Koo. *World Wheat Policy Simulation Model: Description and Computer Program Documentation*. Department of Agricultural Economics, North Dakota State University, Fargo, December 1995.
- Canadian Wheat Board: Market Research. “World Durum Outlook. Chris Gillen. June 2013.
- The Western Producer. “Wet Weather Drags Down Global Durum Production”. Sept 2014.
- United Nations. *FAO Production Yearbook*, various years, Rome, Italy.
- U.S. Department of Agriculture, Agricultural Stabilization and Conservation Service. Program Data (computer files), Washington, DC, 2014.
- U.S. Department of Agriculture, Economic Research Service. *Wheat Situation and Outlook Report*. Washington, DC, various issues.
- U.S. Department of Agriculture, Economic Research Service. *PS&D View* (computer files).
- U.S. Department of Agriculture, Economic Research Service. Website.
www.ers.gov/data/macroecomms.