



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search  
<http://ageconsearch.umn.edu>  
[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

**2017 Outlook of the U.S. and World Wheat Industries, 2017-2026**

**Richard D. Taylor**



**Center for Agricultural Policy and Trade Studies  
Department of Agribusiness and Applied Economics  
North Dakota State University  
Fargo, North Dakota 58108-6050**

## ACKNOWLEDGMENTS

The authors extend appreciation to Frayne Olson and Bruce Dahl for their constructive comments and suggestions. Special thanks go to Edie Nelson who helped prepare the manuscript.

NDSU does not discriminate in its programs and activities on the basis of age, color, gender expression/identity, genetic information, marital status, national origin, participation in lawful off-campus activity, physical or mental disability, pregnancy, public assistance status, race, religion, sex, sexual orientation, spousal relationship to current employee, or veteran status, as applicable. Direct inquiries to Vice Provost for Title IX/ADA Coordinator, Old Main 201, NDSU Main Campus, 701-231-7708, [ndsueoaa.ndsu.edu](mailto:ndsueoaa.ndsu.edu). This publication will be made available in alternative formats for people with disabilities upon request, 701-231-7881.

NDSU is an equal opportunity institution.

Copyright © 2017 by Richard D. Taylor. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.

## TABLE OF CONTENTS

	<u>Page</u>
List of Tables .....	ii
List of Figures .....	iii
Abstract .....	iv
Highlights .....	v
Introduction .....	1
World Wheat Industry.....	2
Wheat Classes.....	2
Wheat Production .....	2
Wheat Consumption .....	5
Wheat Trade .....	6
Recent Changes in the World Wheat Prices .....	8
Outlook for the World Wheat Industry.....	8
United States.....	9
Canada.....	12
European Union.....	13
Australia .....	15
Argentina.....	16
Former Soviet Union Countries .....	17
Importing Countries .....	18
Asian Importers .....	18
African Importers .....	19
Latin America Importers .....	20
Concluding Remarks.....	21
References.....	23

## LIST OF TABLES

<u>No.</u>	<u>Page</u>
1. Wheat Production by Class, 2012 to 2016.....	3
2. Harvested Area, Yields, and Production for Major Wheat Producing Countries/Regions.....	5
3. Wheat Imports by Country, 2012 to 2016 .....	6
4. Wheat Exports by Class, 2012 to 2016.....	7
5. Wheat Production, Consumption, Exports, and Carry-over Stocks in the United States ....	10
6. Wheat Production, Consumption, Exports, and Carry-over Stocks in Canada .....	12
7. Wheat Production, Consumption, Exports, and Carry-over Stocks in the European Union .	14
8. Wheat Production, Consumption, Exports, and Carry-over Stocks in Australia.....	16
9. Wheat Production, Consumption, Exports, and Carry-over Stocks in Argentina .....	17
10. Wheat Production and Exports in Russia, Ukraine, and Other Former Soviet Union Countries.....	17
11. Imports of Common and Durum Wheat by Major Importing Countries .....	18

## LIST OF FIGURES

<u>No.</u>	<u>Page</u>
1. Changes in Wheat Production in Major Producing Countries/Regions.....	4
2. Historical Farm Price, by Class, 1990-2016 .....	8
3. Projected U.S. Farm Wheat Price, by Class, 2016 - 2026 .....	9
4. U.S. Wheat Production by Class, 2016 - 2026 .....	10
5. U.S. Common Wheat Utilization, 2016 - 2026.....	11
6. U.S. Durum Wheat Utilization, 2016 - 2026 .....	11
7. Canadian Western Red Spring Wheat Utilization, 2016 - 2026 .....	13
8. Canadian Western Amber Durum Wheat Utilization, 2016 - 2026.....	13
9. EU Common Wheat Utilization, 2016 - 2026 .....	14
10. EU Durum Wheat Utilization, 2016 - 2026 .....	15
11. Australian Common Wheat Utilization, 2016 - 2026 .....	15
12. Argentine Common Wheat Utilization, 2016 - 2026.....	16
13. Common Wheat Imports by Major Asian Countries, 2016 - 2026.....	19
14. Common and Durum Wheat Imports by Major African Countries, 2016 - 2026.....	20
15. Common and Durum Wheat Imports by Latin American Countries, 2016 - 2026.....	20

**2017 Outlook of the U.S. and World Wheat Industries, 2017-2026**  
**Richard D. Taylor**

**ABSTRACT**

This report evaluates the U.S. and world wheat markets for the 2017-2026 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 soft for the next ten years. World demand for both common and durum wheat are expected to remain stable however the large supplies of 2014, 2015 and 2016 will continue to pressure the market. 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 3.4% from 172.8 million metric tons in 2016 to 178.6 million metric tons in 2026. It is expected that the average price of HRS wheat will be about \$5.35-\$5.40 and durum wheat prices are expected to be \$5.90 to \$6.00 in 2026.

Production of all wheat classes except for white wheat and SRW wheat in the United States is predicted to decrease for the 2016-2026 period. The largest decrease in production occurs for U.S. durum wheat, followed by HRS and HRW wheat. The U.S. export of common wheat is predicted to decrease by 8.4% for the 2016-2026 period and 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 increase slightly while the production of Canadian western amber durum (CWAD) wheat is predicted to decrease for the 2016-2026 period. CWRS wheat exports are projected to decrease by 18.7%, while durum wheat exports increase by 13.9%.

Common and durum wheat production in the European Union (EU) is predicted to increase by 1.4% and 7.6%, respectively, for the 2016-2025 period. The EU is expected to decrease its common wheat exports and export a small amount of durum wheat.

Australia's wheat production is predicted to grow by 3.0% over the 2016-2026 period. Wheat exports are expected to decrease from 19.9 million metric tons in 2014-2016 to 18.8 million metric tons in 2026.

Argentine wheat production is projected to increase by 26.4% to about 16.2 million metric tons in 2026. Wheat exports are expected to increase from 8.7 million metric tons in 2014-2016 to 9.4 million metric tons in 2026.

The FSU, China, and India were importers of wheat in the past but have exported wheat during the recent years. Wheat production in India has increased 71% since the 1980s. Most of the increase has been due to increases in yields. China's wheat production reached a recent record level in 2015 at 130 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 30.2 million metric tons of wheat by 2026 and Ukraine is expected to export about 18.0 million metric tons by 2026.

Most importing countries except for Japan, Taiwan and Brazil are predicted to increase their imports for both common and durum wheat. Among those countries, import demand for common wheat in Egypt, Algeria, Morocco, and Mexico 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 South Korea, are expected to remain the same, although per capita consumption is falling.



## **2016 Outlook of the U.S. and World Wheat Industries, 2017-2026**

Richard D. Taylor

### **INTRODUCTION**

This report evaluates the U.S. and world wheat industries for the 2017-2026 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 751 million tons in 2016. The EU (144 million tons) was the largest producer of wheat in 2016, followed by China (129 million tons) and the FSU (83 million tons). The United States produced 63 million tons of wheat in 2015, an increase from 61 million tons in 2000. 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 173 million tons in 2016, which is about 23% 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 2016 wheat prices fell to the \$4.50 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 resumes 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 2012-2016 period was 58.7 million tons, with 23.9 million tons of HRW, 14.2 million tons of HRS, 11.6 million tons of SRW, 6.8 million tons of white wheat, and 2.1 million tons of durum wheat (Table 1).

**Table 1. Wheat Production by Class, 2012-2016 (thousand tons)**

Country/Class	2012	2013	2014	2015	2016	Average	Share
---------------	------	------	------	------	------	---------	-------

								of Average
Argentina								
Common	9,300	10,500	13,930	11,300	14,400	11,886		1.7
Australia								
Common	29,905	22,461	26,500	26,500	26,500	26,373		3.7
Canada								
Total	27,205	37,530	29,420	27,594	31,700	30,690		4.3
Common	22,578	31,025	24,227	22,319	23,900	24,810		3.5
Durum	4,627	6,505	5,193	5,275	7,800	5,880		0.8
EU								
Total	133,949	144,582	156,525	159,600	140,900	147,111		20.5
Common	125,974	136,480	148,825	151,300	133,000	139,116		19.4
Durum	7,975	8,102	7,700	8,300	7,900	7,995		1.1
United States								
Total	61,304	58,111	55,152	56,124	62,863	58,711		8.2
HRW	27,164	20,343	20,106	22,605	29,442	23,932		3.3
HRS	13,704	13,353	15,120	15,449	13,421	14,210		2.0
SRW	11,233	15,474	12,371	9,774	9,396	11,649		1.6
White	6,987	7,363	6,083	6,010	7,771	6,843		1.0
Durum	2,218	1,579	1,473	2,286	2,833	2,078		0.3
Russia	37,720	52,091	59,000	61,129	72,092	56,406		7.9
Ukraine	15,761	22,278	24,500	27,250	26,975	23,353		3.3
Other Soviet	24,321	29,504	28,100	29,939	32,437	28,860		4.0
Other World	319,146	337,948	334,942	335,793	343,362	334,238		46.6
Total World	658,611	715,005	728,069	735,229	751,229	717,629		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 2012-2016 period included 24.8 million tons of CWRS and 5.9 million tons of durum wheat (Table 1).

The EU produced an annual average of 147.1 million tons of soft wheat and 8.0 million tons of durum wheat during the 2012-2016 time period. France accounted for 30% of soft wheat production in the EU in 2016. 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 2016, 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 26.3 million tons for the 2012-2016 period. Wheat production is concentrated in the eastern Australian states of New South Wales and Victoria. However, in 2012 Australia produced 29.9 million tons of wheat compared to 22.5 million metric tons in 2013 and 26.5 million metric tons in 2016.

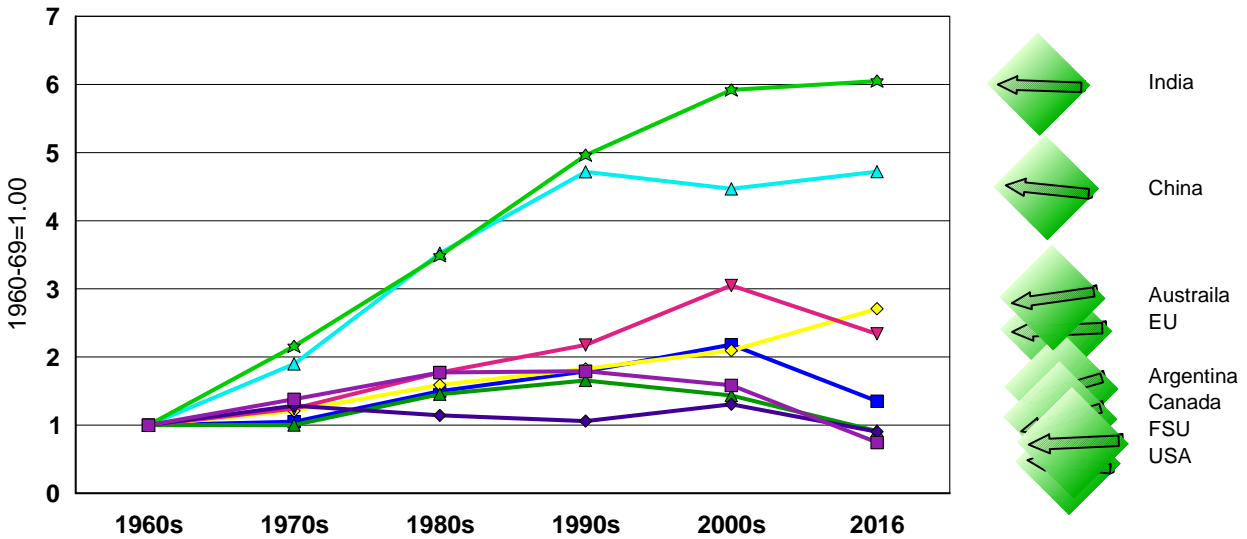
Argentina produces wheat with characteristics of both soft and hard wheat. Argentina's average wheat production amounted to 11.9 million tons for the 2012-2016 period. Argentina has

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 however 2015 harvest was 12.5% smaller than 2014 and 2016's harvest was 27% larger than 2015.

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 the EU and Australia have increased 54% and 99% respectively, since the 1970s. Wheat area in the United States increased less than 1% and has increased in Canada by 76%, from the 1970s level. World wheat harvested area has increased about 7%.

Yields increased by 364% in China since the 1970s and by 138% in India. The EU had yield increases of 106%. The U.S. yields increased by 69%, while Canadian yields increased by 99%. The world wheat yield increased by 129% during the five decades.

The total wheat production in 2016 increased by 333% in India and by 342% in China compared to wheat production in the 1970s. The EU production increased by 217%, but a large share of that was due to the addition of countries to the EU. Argentina increased production by 225%. The United States and Canada increased production by 71% and 251%, 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	2016	% Change from 1970
<b>Harvested Area</b> -----1,000 hectares-----							
Argentina	3,701	5,023	5,798	6,540	4,845	4,566	32.4
Australia	6,479	11,283	9,218	12,141	13,502	12,900	99.1
Canada	5,052	11,098	14,098	10,855	8,296	8,878	75.7
China	25,458	29,228	30,753	26,650	24,257	24,190	-5.0
EU	17,581	16,995	17,310	26,706	26,016	27,092	54.1*
Russia			23,540	21,300	21,750	27,004	NA
Ukraine			7,577	5,161	6,284	6,450	NA
Other Soviet			15,846	14,252	17,743	17,093	NA
India	16,626	22,172	23,502	27,486	28,457	30,220	81.8
U.S.	17,651	28,773	27,965	21,474	18,973	17,762	0.6
World	206,979	236,901	231,004	215,367	216,847	221,728	7.1
<b>Yield</b> -----metric tons/hectare-----							
Argentina	1.33	1.55	1.90	2.49	3.55	3.27	145.9
Australia	1.22	0.96	1.63	1.82	2.03	2.71	122.1
Canada	1.79	1.74	2.28	2.45	2.81	3.57	99.4
China	1.15	1.89	3.19	3.74	4.75	5.33	363.5
EU	2.59	3.97	5.15	4.97	5.25	5.34	106.2
Russia			2.11	1.62	1.91	2.69	NA
Ukraine			4.01	1.98	2.68	4.16	NA
Other Soviet			1.96	1.29	1.28	1.87	NA
India	1.21	1.44	2.12	2.78	2.84	2.88	138.0
U.S.	2.09	2.25	2.66	2.82	3.10	3.54	69.4
World	1.48	1.84	2.55	2.71	3.00	3.39	129.1
<b>Production</b> -----1,000 metric tons-----							
Argentina	4,920	7,780	10,992	16,300	17,200	16,000	225.2
Australia	7,890	10,856	15,066	22,108	27,410	35,000	127.86
Canada	9,024	19,291	32,098	26,536	23,300	31,700	251.3
China	29,185	55,210	98,229	99,640	115,180	128,850	341.5
EU	45,598	67,390	89,095	132,729	136,667	144,658	217.2*
Russia			49,596	34,455	41,508	72,529	NA
Ukraine			30,374	10,197	16,844	26,800	NA
Other Soviet			20,300	18,446	22,675	30,915	NA
India	20,093	31,830	49,850	76,369	80,804	87,000	333.0
U.S.	36,795	64,798	74,292	60,641	58,868	62,859	70.8
World	306,531	435,867	588,781	582,806	649,460	751,357	145.1

Source: USDA

\*Addition countries were incorporated to the EU

### **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 Algeria, Brazil, China, 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 exporting 14 thousand metric tons of wheat in 2013 and importing 2 million metric tons in 2014 and 2015. Its average import was 2.9 million metric ton for the 2012-2016 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, Japan, and Brazil, (Table 3).

**Table 3. Wheat Imports by Countries, 2012 to 2016**

Country	2012	2013	2014	2015	2016	Average	Share of Average
-----1,000 metric tons-----							
Algeria	6,455	6,516	6,495	6,455	8,175	7,492	4.6
Brazil	5,773	4,159	5,302	5,773	4,900	5,407	3.3
China	1,991	-14	1,955	1,991	2,747	2,898	1.8
Egypt	8,123	10,375	11,418	8,123	11,250	10,329	6.4
Japan	6,598	5,301	6,354	6,598	5,530	5,811	3.6
Korea	5,295	4,636	5,057	5,295	4,800	4,454	2.8
Mexico	3,094	2,583	4,230	3,094	3,100	3,224	2.0
Morocco	3,597	3,847	3,543	3,597	4,750	4,044	2.5
Nigeria	3,348	2,640	3,048	3,348	4,100	3,990	2.5
Other	100,496	107,160	115,595	120,782	126,818	114,170	70.6
Total World	145,340	158,537	159,073	169,982	176,170	161,820	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 the EU, Canada, Russia and Australia (Table 4). The United States leads in exports of HRW and SRW wheat; an average of 24.8 million metric tons of all wheat classes was exported annually from 2012 to 2016, of which 9.4 million metric tons were HRW and 7.5 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, 2012 to 2016**

Country	2012	2013	2014	2015	2016	Average	Share of Average
	-----1,000 metric tons-----						%
Argentina/Common	3,548	2,248	5,266	9,395	7,995	5,690	3.1
Australia/Common	18,504	18,458	16,431	15,974	23,850	18,643	10.3
Canada							
All	18,470	22,822	23,674	21,649	21,015	21,526	11.9
Common	14,239	17,757	18,511	17,459	16,015	16,796	9.3
Durum	4,231	5,065	5,163	4,190	5,000	4,730	2.6
EU							
All	17,510	28,056	29,443	27,761	18,500	24,254	13.4
Common	18,285	28,956	30,593	29,061	20,100	25,399	14.1
Durum	-775	-900	-1,150	-1,300	-1,600	-1,145	NA
United States							
All	24,233	27,438	23,518	21,094	27,896	24,836	13.7
HRW	9,916	11,625	7,413	6,163	11,703	9,364	5.2
HRS	6,200	8,316	7,448	6,871	8,709	7,502	4.2
SRW	5,082	3,464	3,649	3,266	2,449	3,582	2.0
White	3,161	4,014	4,003	3,996	4,491	3,933	2.2
Durum	-82	-214	-396	88	-163	-143	NA
Russia	10,117	17,747	22,472	24,728	28,500	20,713	11.5
Ukraine	7,145	9,687	11,242	17,404	15,475	12,191	6.7
Other Soviet	-901	-2,281	1,168	-1,981	-2,145	-1,228	NA
Other Producers							
All	57,712	27,508	38,374	25,277	35,065	48,330	26.7
Total World							
All	158,140	142,876	165,992	164,447	172,823	160,856	100.0

Source: USDA

## RECENT CHANGES IN U.S. WHEAT PRICES

Figure 2 shows the recent marketing year price trends for U.S. wheat. The price levels have varied from a high of \$10.69 per bushel in 2014 for durum wheat to a low of \$2.16 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, 2008, 2011 and 2012 but falling in 2009, 2013, 2014, 2015 and 2016. Prices respond to changes in supply and demand; and/or major changes or shocks in the world wheat industry.

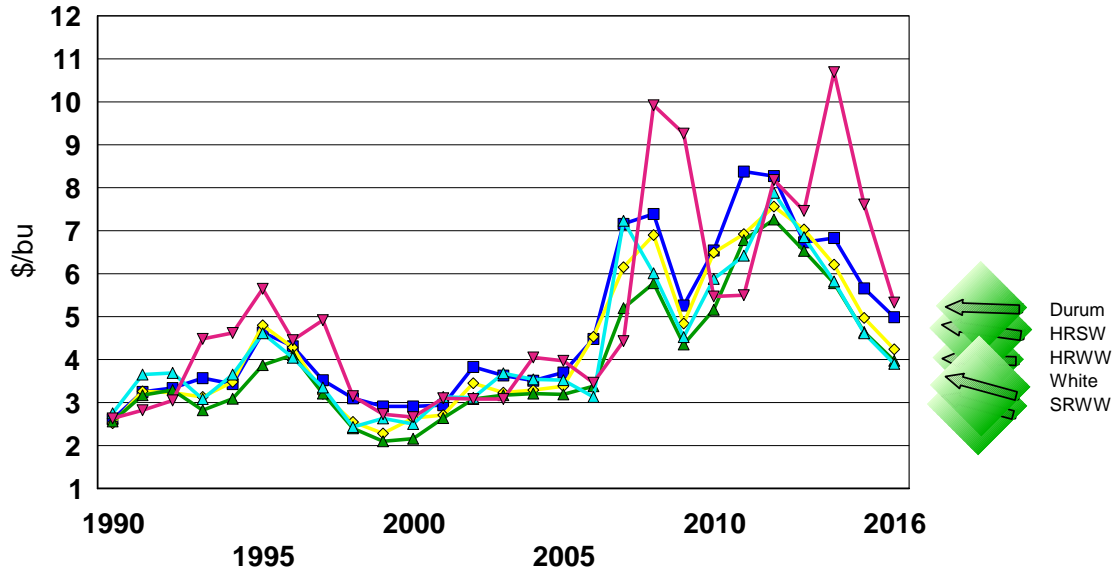


Figure 2. Historical Farm Price by Class, 1990-2016

## 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 2016-2026 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 forecasts 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

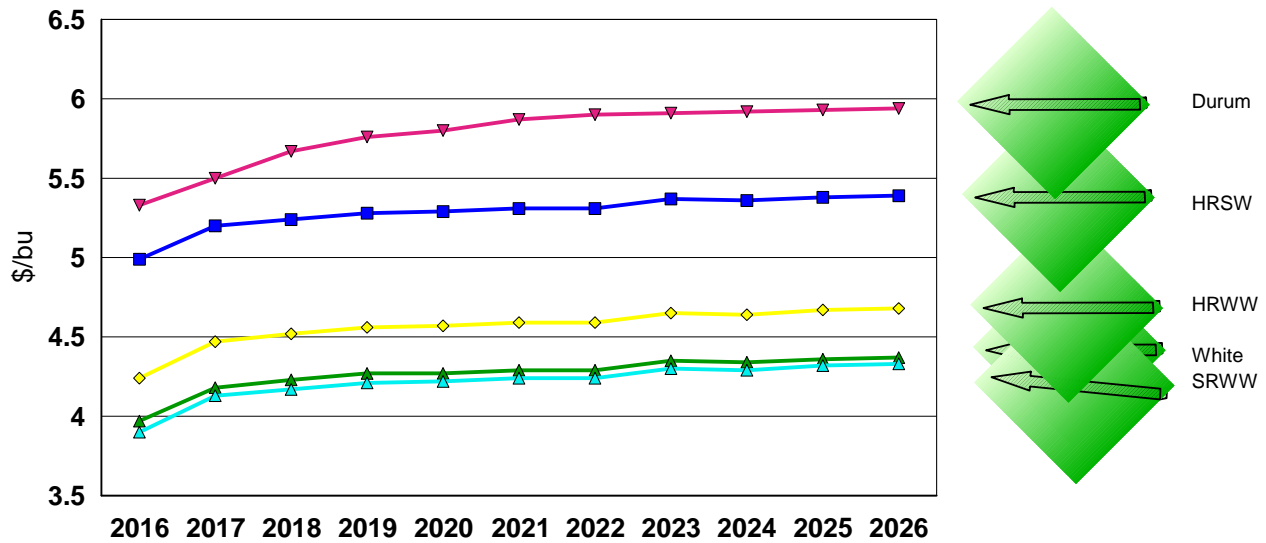


model used the predicted prices of all agricultural commodities, except wheat, from USDA long range price forecasts. The model uses 2016 as the base year of the simulation.

Total world wheat trade for the eight major exporting countries/regions is projected to increase by 3.4% from 172.8 million metric tons in 2016 to 178.6 million metric tons in 2026. Trade of all wheat classes is expected to increase for the 2016-2026 period. White wheat production is predicted to increase in the U.S. faster than in other wheat class.

**United States**

Figure 3 shows the projected prices for the various classes of wheat. The prices of common wheat classes are expected to increase about \$0.40 above the 2016 level by 2026. The prices of HRS wheat are projected to increase from \$5.20 in 2017 to about \$5.39 per bushel by 2026. Durum wheat is expected to rise from the \$5.50 range in 2017 to about \$5.94 per bushel in 2026.



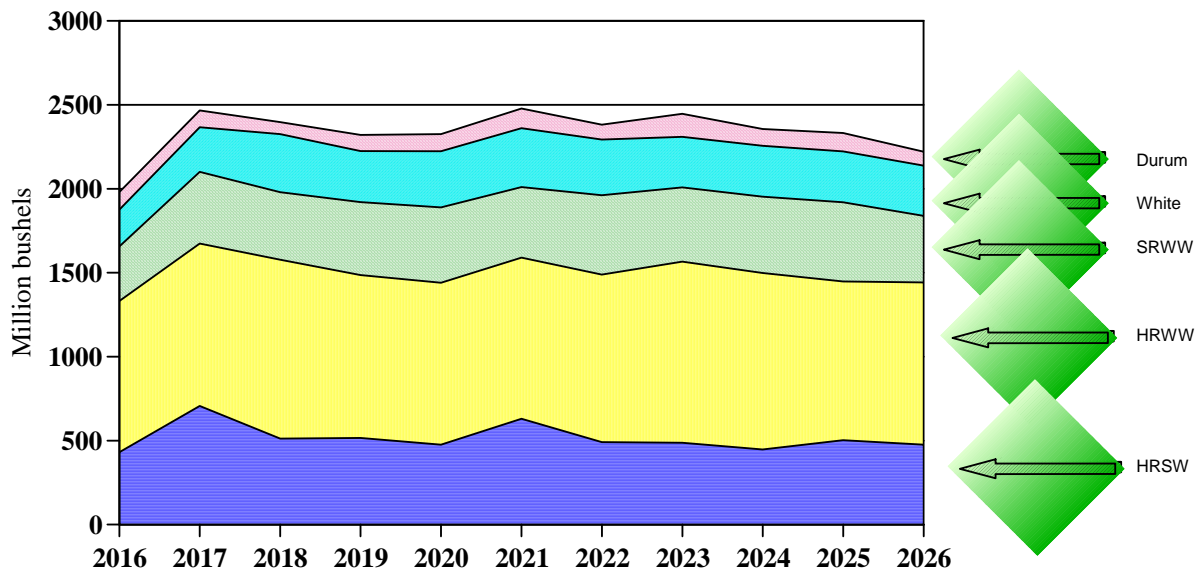
**Figure 3. Projected U.S. Farm Wheat Price, by Class, 2016-2026**

Table 5 shows wheat production, consumption, exports, and ending stocks in the United States. By 2026, total U.S. common wheat production is expected to decrease by 4.9% below the 2014-2016 average, but is much lower than production during the late 1990s. The largest increase in production occurs for white wheat (5.1%) followed by SRW wheat (3.7%). Production of HRS wheat is expected to decrease by 9.0%. Changes in production of different classes of wheat over the 2016-2026 average are shown in Figure 4.

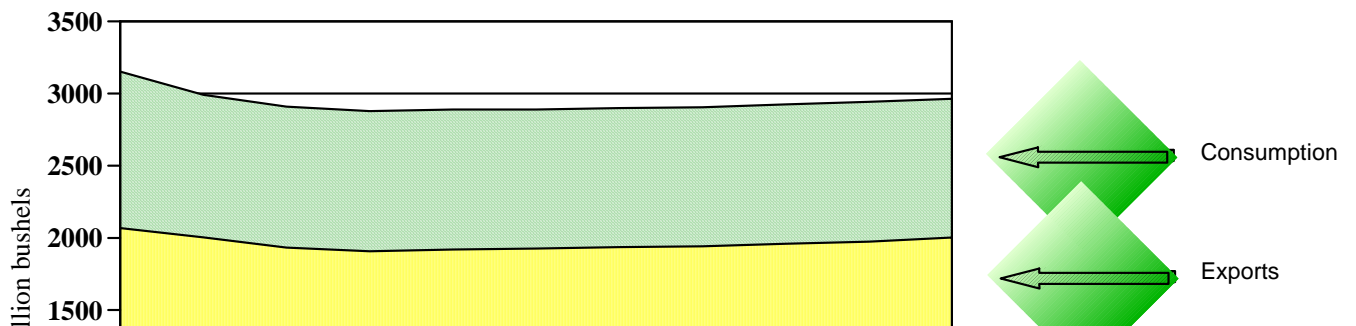
**Table 5. Wheat Production, Consumption, Exports, and Carry-over Stocks in the United States**

	Average	2016	2026	% Change from
--	---------	------	------	---------------

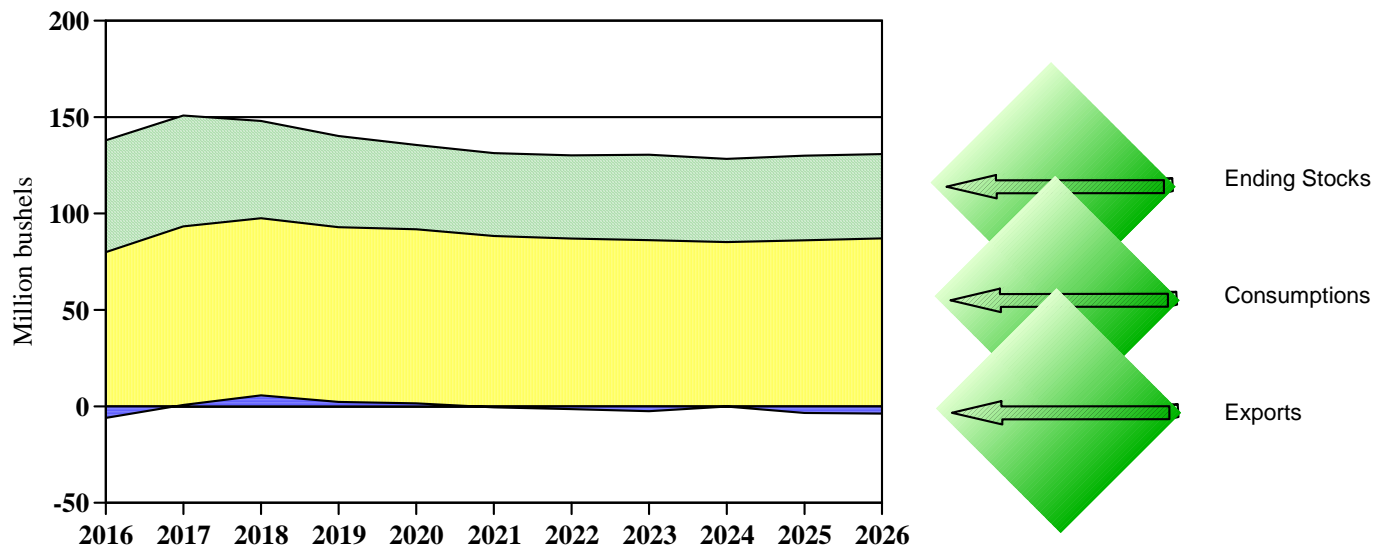
	(2014-2016)			the average to 2026
	-----1,000 metric tons-----			
<u>Production</u>				
Common	59,494	62,863	56,554	-4.9
HRW	26,023	29,442	23,979	-7.9
HRS	14,435	13,421	13,130	-9.0
SRW	9,585	9,396	9,943	3.7
White	6,890	7,771	7,240	5.1
Durum	2,560	2,833	2,259	-11.7
<u>Consumption</u>				
Common	31,437	32,989	35,623	13.3
Durum	2,150	2,177	2,371	10.3
<u>Exports</u>				
Common	20,604	23,299	18,876	-8.4
Durum	(27)	(163)	(103)	NA
<u>Carry-over</u>				
Common	27,667	29,532	26,192	-5.3
Durum	1,170	1,579	1,189	1.6



**Figure 4. U.S. Wheat Production by Class, 2016-2026**



**Figure 5. U.S. Common Wheat Utilization, 2016-2026**



**Figure 6. U.S. Durum Wheat Utilization, 2016-2026**

The increased wheat production in the United States is due to increases in yields as harvested acres has fallen from 72 million acres in 1980 to 44.5 million acres in 2016. Total wheat harvested area is expected to decrease slowly from 45.8 million acres for the 2014-2016 average to 40.4 million acres in 2026, and average yield is predicted to increase from 46.7 bushels per acre to 51.4 bushels per acre over the 2016-2026 period. U.S. durum area is expected to decrease 5.3% for the same time period because farmers are expected to return to a more traditional crop mix.

Common wheat consumption is expected to increase during the 2016-2026 time period. U.S. durum wheat consumption is expected to increase by 10.3 for the 2016-2026 time period (Figure 6).

The United States is expected to be a net importer of durum wheat throughout the forecast period (Table 5). Common wheat exports are predicted to decrease from 20.6 million metric tons in 2014-2016 to 18.9 million metric tons in 2026. Ending stocks are expected to decrease by 5.3% for common wheat compared to the 2014-2016 average and increase 1.6% for durum wheat (Table 5).

**Canada**

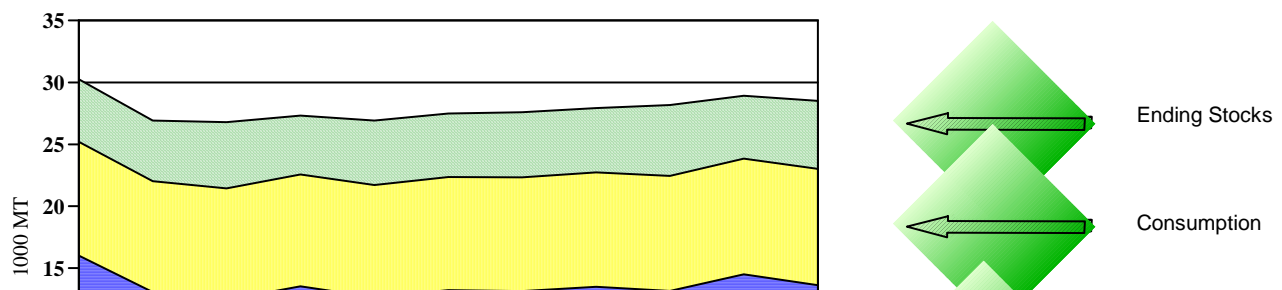
CWRS wheat production is predicted to increase by 1.4% and decrease by 8.8% for CWAD, from the 2014-2016 average (Table 6). Total area for CWRS wheat is expected to increase between 2016 and 2026, while CWAD wheat area is expected to decrease from 2.4 million acres in 2016 to 2.2 million acres in 2026.

Domestic consumption of CWRS wheat is predicted to increase by 16.1%, while the consumption of durum wheat is expected to decrease by 4.2% over the 2016-2026 period. Canadian CWRS wheat exports are projected to decrease by 18.7% by 2026, and CWAD wheat exports are predicted to increase by 13.9% from 4.6 million metric tons to 5.2 million metric tons in 2026. Ending stocks are predicted to increase by 15.6% for CWRS wheat and decrease 1.5% for CWAD wheat over the 2016-2026 period. During the preceding years, 2000-2005, ending stocks of CWAD in Canada were between 1 million and 2.8 million metric tons.

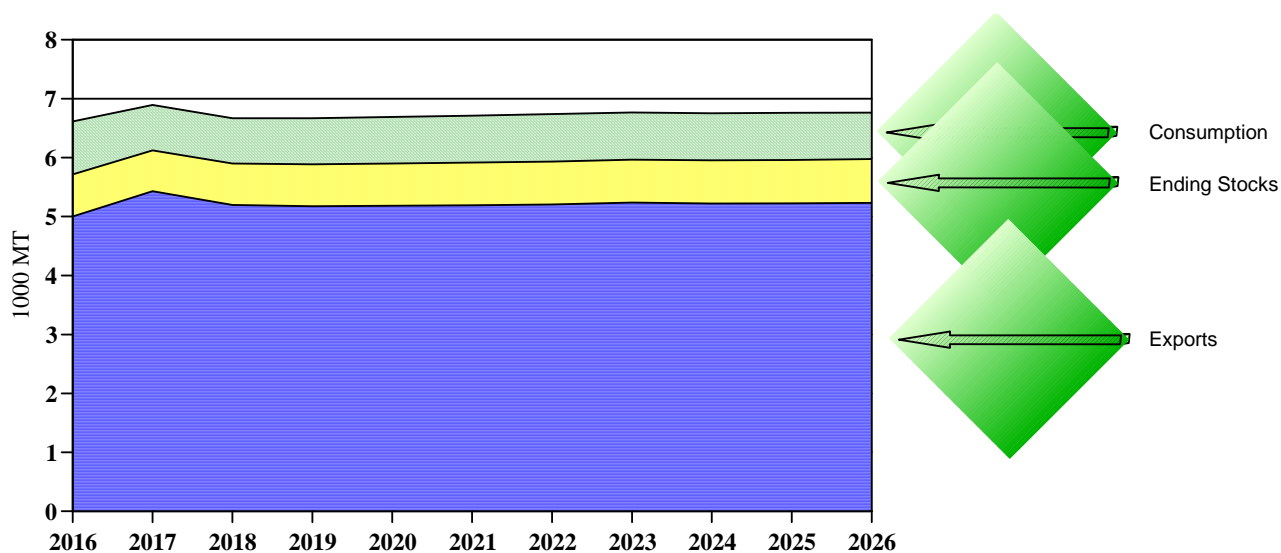
**Table 6. Wheat Production, Consumption, Exports, and Carry-over Stocks in Canada**

	Average (2014-2016)	2016	2026	% Change (2014-16) to 2026
<u>Production</u>				
-----1,000 metric tons-----				
WRS	23,110	23,900	23,441	1.4
WAD	6,538	7,800	5,964	-8.8
<u>Consumption</u>				
WRS	8,091	9,185	9,396	16.1
WAD	776	715	743	-4.2
<u>Exports</u>				
WRS	16,737	16,015	13,614	-18.7
WAD	4,595	5,000	5,232	13.9
<u>Carry-over</u>				
WRS	4,760	5,052	5,503	15.6
WAD	800	900	788	-1.5

Figure 7 shows changes in consumption, exports, and ending stocks of CWRS wheat in Canada from 2016 to 2026, and Figure 8 shows the utilization for CWAD wheat.



**Figure 7. Canadian Western Spring Wheat Utilization, 2016-2026**



**Figure 8. Canadian Western Amber Durum Utilization, 2016-2026**

**European Union**

Table 7 presents production, consumption, exports, and ending stocks of common and durum wheat in the EU for the 2016-2026 period. Common wheat production in the EU is predicted to increase by 1.4% from the 2014-2016 average by 2026, while durum wheat production is expected to increase by 7.6% for the same time period.

Domestic consumption of common wheat is projected to increase by 2.6%, and consumption of durum wheat is predicted to decrease by 1.3% for the 2016-2026 period. Exports of common wheat in 2026 are predicted to decrease 12.6% from the 2014-2016 averages. Ending stocks are expected to increase for common wheat and decrease for durum wheat.

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

	Average	2016	2026	% Change
--	---------	------	------	----------

	(2014-2016)		(2014-16) to 2026	
<u>Production</u>	-----1,000 metric tons-----			
Common	142,150	133,000	144,196	1.4
Durum	8,100	7,900	8,713	7.6
<u>Consumption</u>				
Common	119,500	120,000	122,565	2.6
Durum	8,500	8,200	8,387	-1.3
<u>Exports</u>				
Common	24,581	20,100	21,488	-12.6
Durum	-1,450	-1,600	360	NA
<u>Carry-over</u>				
Common	11,900	8,000	14,022	17.8
Durum	1,275	750	753	-40.9

Figures 9 and 10 show changes in consumption, exports, and ending stocks of common and durum wheat for the 2016-2026 period. Common wheat consumption are expected to increase slightly.

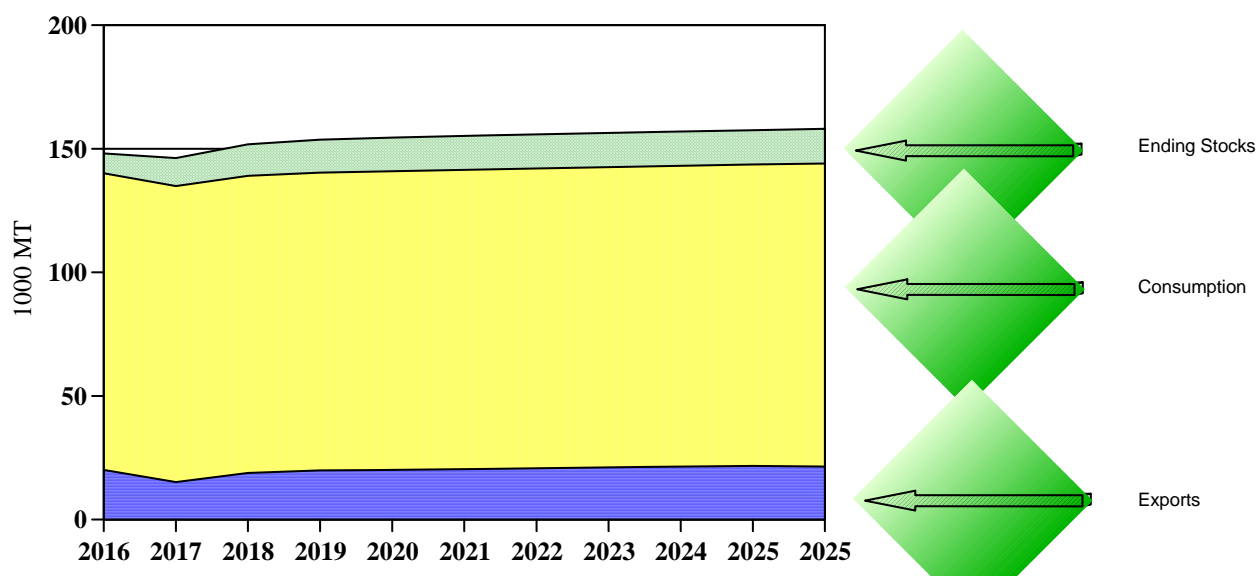
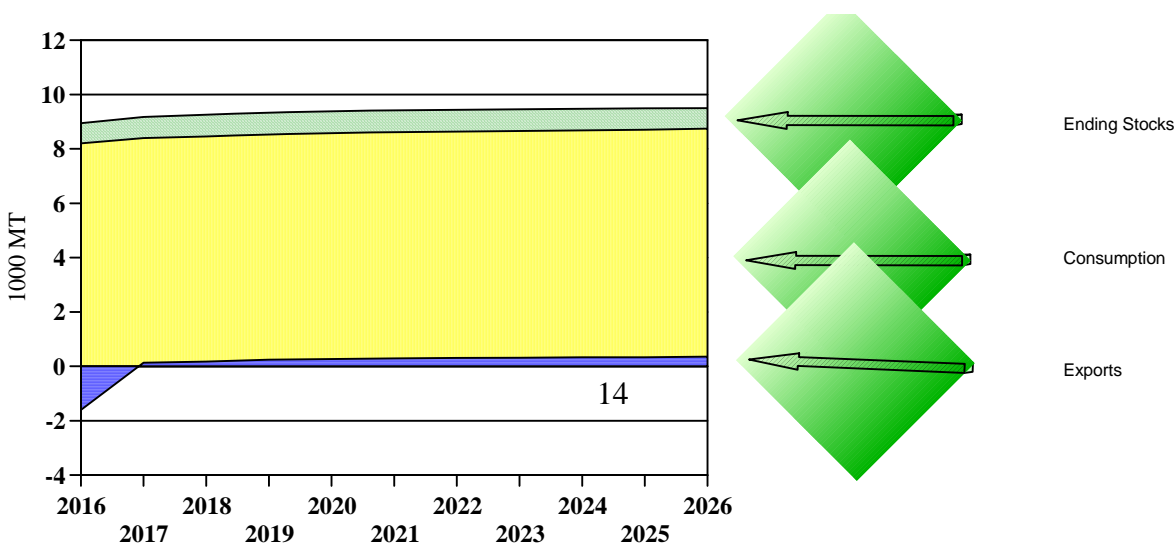
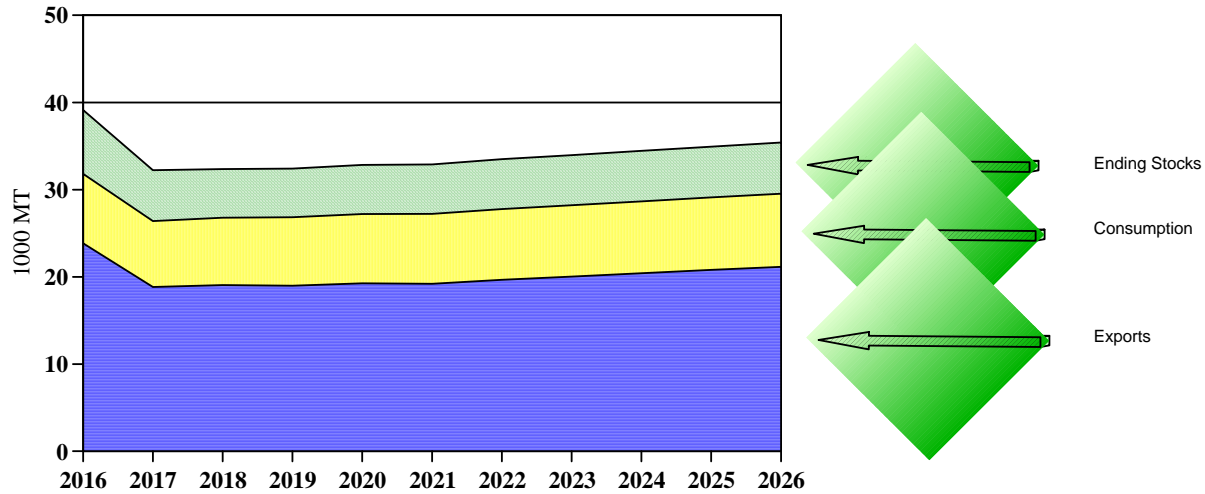


Figure 9. EU Common Wheat Utilization, 2016-2026



**Figure 10. EU Durum Wheat Utilization, 2016-2026**



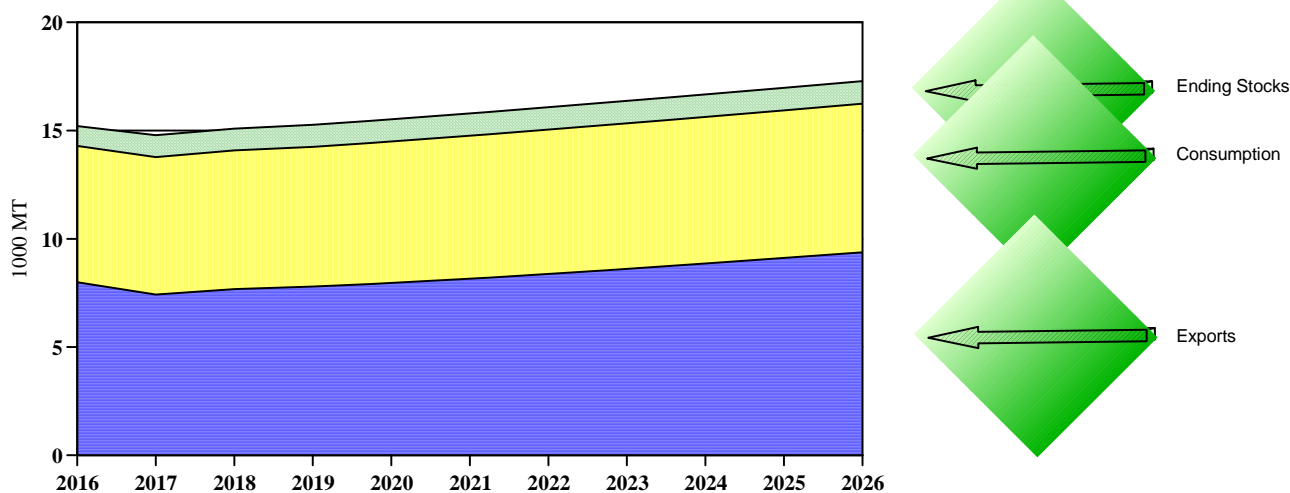
**Figure 11. Australia Common Wheat Utilization, 2016-2026**

**Australia**

Compared to the 2014-2016 average, Australian wheat production is projected to grow by 3.0% in 2026 (Table 8). 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 9.1% from the 2014-2016 average of 7.7 million metric tons to 8.4 million metric tons in 2026. Wheat consumption in Australia during the poor harvests in 2010 and 2012 decreased 24% compared to the long term average. Wheat exports are predicted to decrease from the 2014-2016 average of 19.9 million metric tons to 18.8 million metric tons in 2026. Figure 11 shows changes in consumption, exports, and ending stocks for the 2016-2026 period. The single desk exporting powers of the Australian Wheat Board were removed in July of 2008. 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 (2014-2016)	2016	2026	% Change (2014-16) to 2026
Production	28,724	33,000	29,595	3.0
Consumption	7,693	7,960	8,393	9.1
Exports	19,912	23,850	18,837	-5.4
Carry-over	6,733	7,328	5,870	-12.8



**Figure 12. Argentine Common Wheat Utilization, 2016-2026**

**Argentina**

Argentine wheat production is projected to increase by 26.4% from the 2014-2016 average of 12.9 million metric tons to 16.2 million metric tons in 2026 (Table 9). Domestic wheat consumption is expected to increase by 12.5% from 6.1 million metric tons to 6.9 million metric tons. Wheat exports are predicted to be 9.4 million metric tons in 2026, which is a 7.9% increase from the 2014-2016 average. Argentine wheat exports are expected to increase because of the government’s elimination of the export tax, removal of foreign exchange restrictions, devaluing the peso by 45%, and the elimination of the export permit system. Ending stocks are expected to increase by 21.5%. Figure 12 shows changes in consumption, exports, and ending stocks for the 2016-2026 period.

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

	Average (2014-2016)	2016	2026	% Change (2014-16) to 2026
	-----1,000 metric tons-----			
Production	12,850	14,400	16,244	26.4
Consumption	6,100	6,300	6,860	12.5
Exports	8,695	7,995	9,380	7.9



Carry-over	862	914	1,047	21.5
------------	-----	-----	-------	------

### **Former Soviet Union Countries**

Russia exported an average of 26.6 million metric tons of wheat during the 2014-2016 time period. Russia is expected to increase exports to 30.2 million metric tons by 2026. Ukraine exported 16.4 million metric tons of wheat during 2014-2016 and is expected to increase exports to 18.0 million metric tons by 2026. The other former Soviet Republics imported 2.1 million metric tons during 2014-2016 and are expected to import about 4.6 million metric tons in 2026.

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

	Average (2014-2016)	2016	2026	% Change (2014-16) to 2026
	-----1,000 metric tons-----			%
<u>Russia</u>				
Production	66,611	72,092	68,284	2.5
Exports	26,614	28,500	30,228	13.6
<u>Ukraine</u>				
Production	27,113	26,975	30,009	10.7
Exports	16,440	15,475	17,985	9.4
<u>Other Soviet Union</u>				
Production	31,187	32,436	35,582	14.1
Exports	-2,063	-2,145	-4,557	NA

### **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	2016	2026	% Change (2014-
--	---------	------	------	-----------------

	(2014-2016)			16) to 2026
	-----1,000 metric tons-----			%
<u>Asia</u>				
China	2,206	1,485	2,231	0.1
S. Korea	4,243	4,850	4,499	6.0
Japan	5,494	5,530	5,403	-1.6
Taiwan	1,406	1,385	1,391	-1.1
<u>North Africa</u>				
Algeria				
Common	5,727	5,725	6,607	15.4
Durum	2,425	2,450	2,787	14.9
Morocco	3,758	4,750	5,195	38.2
Egypt	11,312	11,250	15,761	39.3
Tunisia				
Common	947	951	993	4.9
Durum	560	562	607	8.5
Nigeria	4,055	4,100	5,918	45.9
<u>Latin America</u>				
Brazil	5,296	4,900	5,139	-3.0
Mexico	3,169	3,100	3,680	16.1
Venezuela				
Common	1,010	900	1,170	15.8
Durum	503	475	541	7.7

### **Asian Importers**

Imports by Japan are projected to decrease by 1.6% over the 2016-2026 period because of population decreases (Figure 13), and Korean imports are projected to increase by 6.0% over the same time period. China imported 2.2 million metric tons of wheat annually during 2014-2016. China is projected to continue to import a similar amount of wheat in 2026. 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. Taiwan is expected to decrease wheat imports by 1.1% by 2026.

### **African Importers**

North African imports of wheat are projected to increase by 29.2% from the 2014-2016 average to 2026. Egyptian imports of common wheat are projected to increase by 39.3%, from 11.3 million metric tons in 2014-2016 to 15.7 million metric tons in 2026. The increase in Egyptian imports is due to the population growth in the country. Algeria is expected to import both common and durum wheat. Algerian imports of common wheat are projected to increase by 15.4% from the 2014-2016 average to 6.6 million metric tons in 2026, and durum wheat imports are projected to

increase by 14.9%, from 2.4 million metric tons to 2.8 million metric tons. Morocco's imports of common wheat are projected to increase by 38.2% between the 2014-2016 average and 2026. Morocco's imports are very erratic, depending on its unstable domestic production. Tunisian imports of common wheat are projected to increase by 4.9%, between the 2014-2016 average and 2026. Its durum wheat imports are projected to increase by 8.5% from the 2014-2016 average to 2026 (Figure 18). Nigeria is expected to increase imports from 4.1 million metric tons in 2014-2016 to 5.9 million metric tons in 2026.

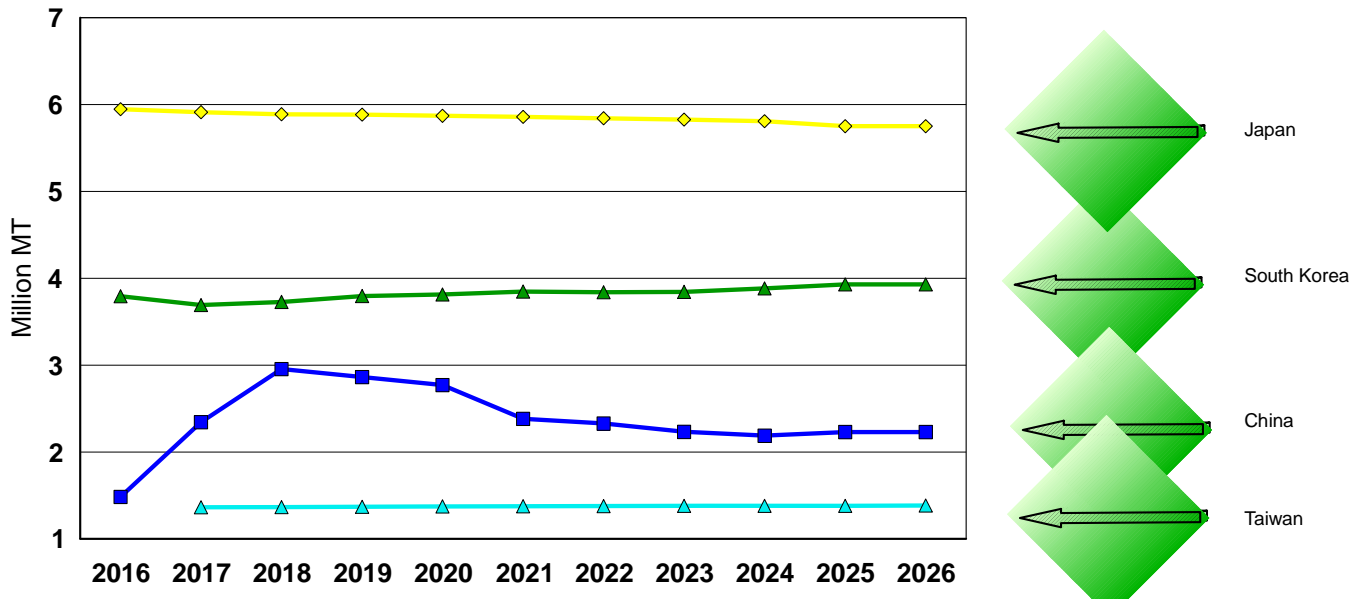
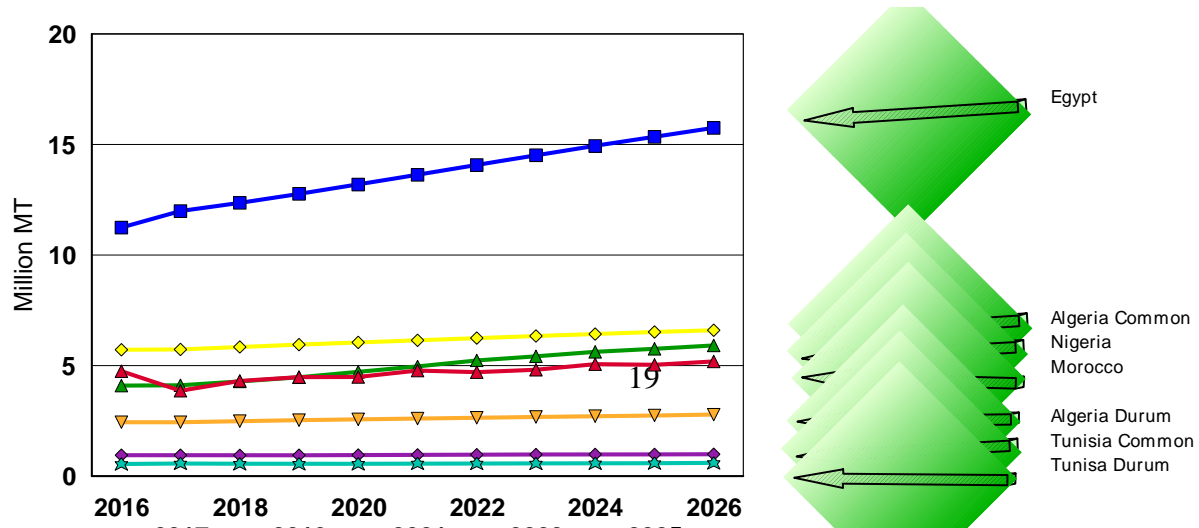
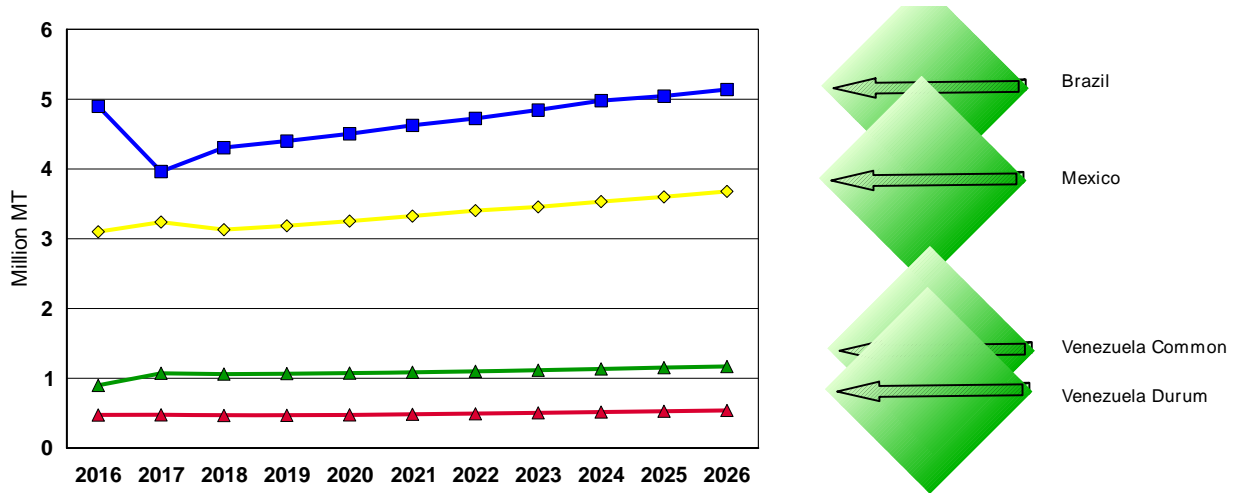


Figure 13. Common Wheat Imports by Major Asian Countries, 2016-2026



**Figure 14. Common and Durum Wheat Imports by Major African Countries, 2026-2026**



**Figure 15. Common and Durum Wheat Imports by Latin American Countries, 2016-2026**

**Latin America Importers**

Mexican imports are projected to increase by 16.1% from the 2014-2016 average of 3.2 million metric tons to 3.7 million metric tons by 2026. Venezuela is expected to import more common and durum wheat. Common wheat imports in Venezuela are projected to increase by 15.8% from 1.0 million metric tons for the 2014-2016 average to 1.2 million metric tons in 2026, and durum wheat imports are projected to increase by 7.7% (Figure 15). Brazilian imports are projected to increase to 5.1 million metric tons by 2026, which is a 3.0% decrease from the 2014-2016 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 2017-2026 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 2017-2026 (2.5% to 5% 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 2016 levels. It is expected that the average price of wheat could be near \$5.35 for HRS wheat and \$5.94 per bushel for durum wheat by 2026.

World wheat exports by the eight major exporters are projected to increase by 3.4% from 172.8 million metric tons in 2016 to 178.6 million metric tons in 2026. 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 the Middle East 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 that might be supplied by Argentina.

The United States, Russia, Ukraine, Australia and Argentina are predicted to increase their production of common wheat for the 2017-2026 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 2016-2026 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 472 thousand metric tons of wheat during 2014-2016. India could become an importer by 2026.

Chinese wheat production is expected to be 128.0 million metric tons in 2026 which is about the same as in 2016. 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 limit Chinese wheat import growth.

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 2017-2026 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.

Unless there is a weather disruption future prices for wheat should remain soft. World ending stocks are projected to be 12% greater in 2026 than in 2016 which would be 30% of world wheat consumption.

## References

Agriculture and Agri-Food Canada. “Canada: Outlook for Principle Field Crops.” October 22, 2015

Agriculture and Rural Development-European Commission. [ec.europa.eu/agriculture/index\\_en](http://ec.europa.eu/agriculture/index_en)  
Web site 2017-03\_en.

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.

Left Field Commodity Research. [www.leftfieldcr.com](http://www.leftfieldcr.com). Market Situation and Outlook. Chuck Penner.

Market Check website. <http://marketcheck.com.au/smaller-world-export-supplies-of-durum>

Canadian Wheat Growers. [wheatgrowers.ca/pub/documents/presentations/penner\\_WCWGA%20January%202015-20150112114500.pdf](http://wheatgrowers.ca/pub/documents/presentations/penner_WCWGA%20January%202015-20150112114500.pdf)

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, 2017.

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/macroeconmics](http://www.ers.gov/data/macroeconmics).

U.S. Wheat Associates. World and US durum wheat production in 2014. Presentation.  
[www.uswheat.org](http://www.uswheat.org).

World Grain website. [www.World-grain.com](http://www.World-grain.com).