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2006 Outlook of the U.S. Wheat Industry, 2006-2015

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This report evaluates the U.S. wheat industry over the next decade. The outlook projections are based on an assumption that current farm and trade policies adopted by wheat exporting and importing countries will not change. Average weather conditions, historical rates of technological change, and current political policies are also assumed to prevail during the projection period. This update was completed before the May 16, 2006 wheat Outlook was released by the USDA. The estimated production, consumption, trade, and price were forecasted based on information available during April of 2006. Because of dry crop conditions in the southern plains of the United States, USDA price estimates increased from \$3.50 to \$4.10, compared to \$3.35 to \$3.45 in April. However, these temporary increases in wheat prices should not affect the long-run outlook of the U.S. and world wheat industries.

Total world wheat production decreased from 521 million tons in 1986/87 to 506 million tons in 2005/06. The EU (122 million tons) was the largest producer of wheat in 2005, followed by China (97 million tons) and the United States (58 million tons). Other major wheat-producing countries are the Former Soviet Union (FSU), Canada, Australia, India, and Argentina. These eight countries produce about 77% of the wheat 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 122 million tons in 2005, which is about 24% of wheat produced in that year.

World wheat trade is dominated by a few exporting countries: the United States, Canada, Australia, the EU, and Argentina. These countries handle over 41% of wheat traded in the world market. Even though exporting countries compete with each other, the world wheat market is not perfectly competitive. Australia and Canada use wheat boards to market their grain, while the EU relies on export subsidies to increase its market share. In addition, some countries use credit guarantees and long-term preferential trade agreements to promote their exports.

The United States is the largest exporter, followed by Canada and Australia. The United States competes with the EU for market share of soft red winter (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 red spring (HRS) wheat and durum wheat. The United States also exports HRS and durum wheat in competition 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, especially 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.

Total world wheat trade for the five major exporters is projected to increase 9.9% from 77.9 million metric tons in 2005 to 85.6 million metric tons in 2015. Trade of all wheat classes is expected to increase over this period. Common wheat production is predicted to increase faster in Australia than in other countries, and durum wheat production is predicted to increase the fastest in Canada.

Figure 1 shows the recent price trend for U.S. wheat. The price levels have varied from a high of \$5.64 per bushel in 1995 for durum wheat to a low of \$2.25 per bushel in 1999 for HRW wheat. The prices for all of the wheat classes have recovered from the lows of 1998-1999 to the $3.15 to $4.10 range in 2002 and 2003, before falling to the $2.75 to $3.60 range in 2004. Price increased in 2005 to the $3.20 to $4.00 range. All wheat prices are expected to level off by 2011 - HRS at $4.07, HRW at $3.42, and durum wheat at $4.20 - and remain near those levels throughout the remainder of the forecast period.

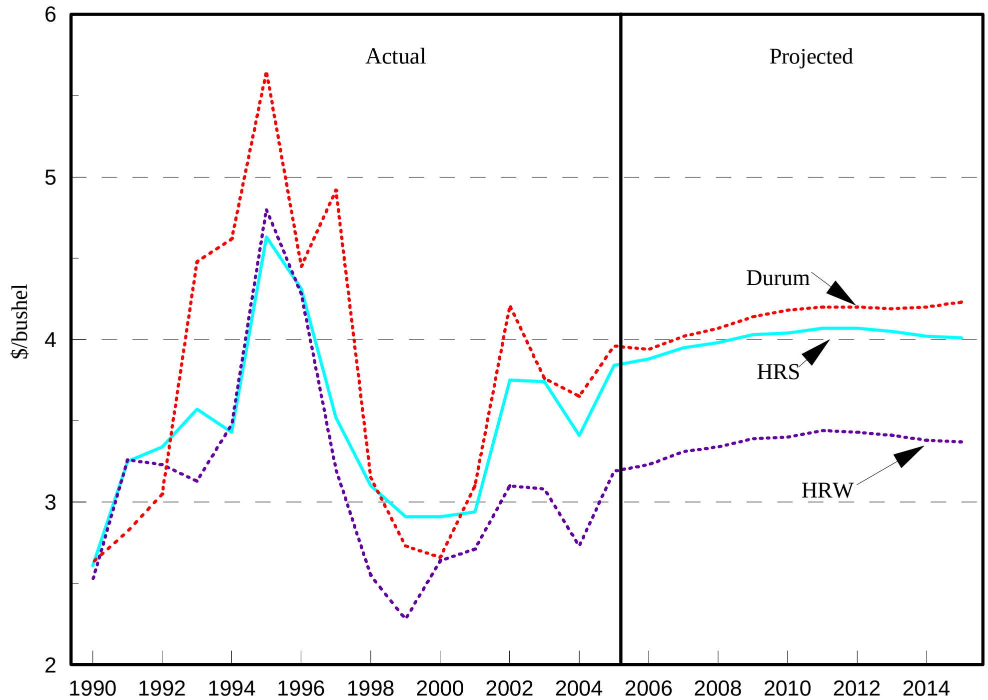

Figure 1. Historical and Projected U.S. Farm Price for Wheat

By 2015, total U.S. wheat production is expected to grow 8.8% above the 2003-2005 average, but it will still be much lower than production during the late 1990s. The largest increases in production occur for U.S. SRW wheat (15.3%), followed by HRW wheat (12.2%) and white wheat (6.9%). Production of durum wheat is expected to increase 8%. U.S. wheat consumption is projected to grow 10.0% for common food and feed wheat and 6.2% for U.S. durum wheat by 2015. U.S. durum exports are projected to decrease 23.6% from 520 thousand metric tons in 2003-2005 to 397 thousand metric tons in 2015. Common wheat exports are predicted to decrease slightly from 29.8 million metric tons in 2003-2005 to 29.2 million metric tons in 2015, although a continued weak dollar may increase exports slightly. Ending stocks are expected to remain constant for common wheat and increase for durum wheat.

Import demand for wheat in North Africa and Latin America will grow faster than that in South Asia for the next ten years. Thus, these two markets will be more important to the U.S. wheat industry than the Asian market.

For more details, see the forthcoming Agribusiness & Applied Economics Report.

The Need for Research and Development to Improve Competitiveness

Jeremy Mattson and Won W. Koo

As a result of increased globalization, agricultural production will become more competitive. To improve competitiveness, countries can increase productivity by investing in agricultural research and development. Productivity captures growth in production not accounted for by growth in inputs. It is often measured by total factor productivity (TFP), which is the ratio of total outputs to total inputs. Factors affecting productivity include research and development (R&D), extension, education, infrastructure, and government programs.[1]

[1] Ahearn, Mary, Jet Yee, Eldon Ball, and Rich Nehrin. "Agricultural Productivity in the United States." Resource Economics Division, Economic Research Service, U.S. Department of Agriculture. Agriculture Information Bulletin No. 740, January 1998.

Global public agricultural research expenditures (measured in 1993 international dollars) increased from $11.8 billion in 1976 to $21.7 billion in 1995, but growth in spending for many parts of the world slowed in the 1990s.[2] In the United States, public sector research funding in real terms has stagnated over the last few decades. Private sector research in the United States, on the other hand, has increased substantially over this period and now surpasses public research. By 1995, spending on private sector research had equaled spending on public sector research in developed countries across the world. On the other hand, private sector research in developing countries remained insignificant, as 95 percent of research in these countries was funded by the public sector.

Agricultural research has led to higher yielding crop varieties, better livestock breeding practices, more effective fertilizers and pesticides, and better farm management practices. Many of the initial advancements led to the Green Revolution, which began in the mid-20th century. Hybrid seeds were developed, machinery sizes increased, and the use of fertilizers, herbicides, pesticides, and irrigation intensified. These advancements led to increased yields and increased productivity in a number of countries around the world, including many developing countries. Animal production also increased due to improved livestock breeding, improved genetics, and advancements in animal nutrition. Some countries did not benefit as greatly, though: there were few gains in many of the staple crops of Africa, such as yams, cassava, sorghum, and cowpeas.[3]

Largely due to these advancements, total agricultural production has been increasing significantly across the world over the last several decades. The amount of land devoted to crops worldwide increased just slightly from 1.4 billion hectares in 1961 to 1.5 billion hectares in 1998, but the quantity of grains and oilseeds produced doubled.[4] Production has been increasing the greatest in percentage terms in developing countries. Agricultural production in developing countries increased 300 percent from 1961 to 2004. In comparison, production in developed countries increased 68 percent, total world production increased 173 percent, and production in the least-developed countries increased 152 percent. The largest percentage increases have been in East Asia, specifically China, and there have also been significant increases in South America, the Middle East, South Asia, and Mexico. The smallest percentage increases have been in Europe and the Caribbean.

Estimates from the USDA's Economic Research Service (ERS) show that TFP for U.S. agriculture has been increasing continuously since 1950. ERS estimates show that TFP grew by an average of 1.8 percent per year from 1948 to 2002. The highest annual growth rates occurred in the late 1950s, the early 1970s, and the 1980s. The annual TFP growth rate from 1990 to 2002 slowed to 1.3 percent. This growth in productivity accounts for the increase in U.S. agricultural production. Since 1948, real expenditures on U.S. agricultural inputs, as estimated by the ERS, have been relatively constant (labor expenditures have decreased significantly and chemical and energy expenditures have risen), while output has grown an average of 1.8 percent per year.

New developments that could lead to further productivity increases include improved technologies for nutrient, soil, water, and pest management; precision agriculture; and agricultural biotechnology.[5] The emergence of biotechnology could have an especially significant impact on productivity worldwide. Currently, most of the genetically modified (GM) crops are produced in developed countries, with the United States producing the largest share. It is estimated that the United States accounted for 63 percent of GM crop production in 2003. GM crop production in the United States has been continually increasing since its introduction in the mid-1990s. In 2005, planted acreage of GM herbicide-tolerant crops expanded to 87 percent of U.S. soybeans and 61 percent of U.S. cotton.

Current biotech crops have been developed mainly to improve agricultural production, but future biotech crops could have increased nutritional content or other characteristics that would benefit consumers. Consumer response to the further adoption of biotech crops is uncertain, but it may become more favorable as these

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[2] Pardey, Philip G., and Nienke M. Beintema. "Slow Magic: Agricultural R&D a Century After Mendel." International Food Policy Research Institute. Washington, D.C., October 26, 2001.

[3] Caswell, Margriet. "Science and Technology Hold Promise for Developing Countries in the 21st Century." Amber Waves. Vol 2, No. 1, p. 9, February 2004.

[4] See note 2 above.

[5] See note 3 above.

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crops are developed with more obvious benefits for consumers. Developing countries could benefit the most from biotechnology through productivity gains and improved nutritional content of crops such as golden rice.

Also, while technological advances appear to initially benefit producers by leading to higher yields, lower costs, and increased productivity, consumers ultimately benefit from lower real food prices. This can be demonstrated by the decline in real commodity prices over time. For example, inflation-adjusted prices of wheat and corn were nearly three times higher in the 1970s than they are today, and they have followed a long-term downward trend over the last century. The lower commodity prices that result from agricultural productivity growth contribute to lower costs for the food processing industry, improving its competitiveness. Some of the decline in real commodity prices and processed food prices are passed on to the consumer. According to ERS data, food expenditures by U.S. consumers as a share of disposable personal income has dropped steadily from 24.2 percent in 1930 to 10.1 percent in 2003. Due to a decline in prices, the social rates of return to publically funded agricultural research and development are relatively high.[6] Research has also led to the development of many non-food uses for agricultural products, increasing the demand for and value of agricultural commodities. For U.S. agriculture to remain competitive under increased globalization, continued public spending on research will be necessary.

For more details, see Agribusiness and Applied Economics Report No. 582, published in May 2006. To download this or other publications free of charge, please visit the CAPTS website (www.ag.ndsu.nodak.edu/capts). Contact Beth Ambrosio by telephone (701-231-7334) or email (beth.ambrosio@ndsu.edu) with any questions.

[6]Shane, Mathew, Terry Roe, and Munisamy Gopinath. "U.S. Agricultural Growth and Productivity: An Economywide Perspective." Market and Trade Economics Division, Economic Research Service, U.S. Department of Agriculture. Agricultural Economic Report No. 758, January 1998.