



# Feed Outlook

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## Corn Crop Projected Smaller in 2018/19

The 2018/19 U.S. corn crop is projected at 14.0 billion bushels on smaller area and lower yield. Supply is 675 million bushels below last year at 16.3 billion bushels. Declines in feed and residual and export prospects are partially offset by strong outlook for corn used for ethanol, resulting in a 175-million-bushel decline in disappearance to 14.6 billion bushels. Carryout is pegged at 1.7 billion bushels, 500 million below last year. The midpoint of the forecast price range is \$3.80 per bushel, \$0.40 higher than last season.

U.S. 2018/19 corn export prospects face tough competition. Competition from Argentina, Ukraine, and Russia, whose combined exports are to increase by more than 8 million tons in 2018/19, is expected to weigh down on U.S exports. On the other hand, U.S. corn export prospects for 2018/19 are starting to get support from the poor current conditions in Brazil, as dryness in major producing areas cuts the country's 2017/18 second-crop corn yields. Marketing of the 2017/18 Brazilian crop is going to begin in July-August 2018 and continue through March 2019 and is expected to affect export markets going into 2018/19. As a result, U.S. corn exports during the first half of the 2018/19 marketing year are expected to be robust. China, the world's largest foreign producer of coarse grains, is expected to continue to be an important factor in global coarse grain demand. High prices for sorghum and barley, supported by strong demand from China, provide an incentive for area expansion throughout the world, leading to an increase in projected foreign sorghum and barley area and output. Coarse grain production is forecast to be lower than use for the second consecutive year. World ending stocks decline lead by China.

# Domestic Outlook

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## U.S. Feed Grain Supplies Reduced

Feed grain supplies are projected 18 million metric tons lower at 430.8 million tons, mostly due to a production decline of 14.5 million tons to 369.5 million. Disappearance is 5.4 million tons lower at 385.9 million, mostly due to reduced feed and residual and exports.

## Grain Consuming Animal Units

Grain consuming animal units (GCAU) for 2018/19 are projected at 100.0 million units, 1.48 million above last year. All categories of livestock and poultry showed increases in inventory. Feed and residual use per GCAU is projected at 1.44 tons per GCAU, 0.4 tons lower than 2017/18.

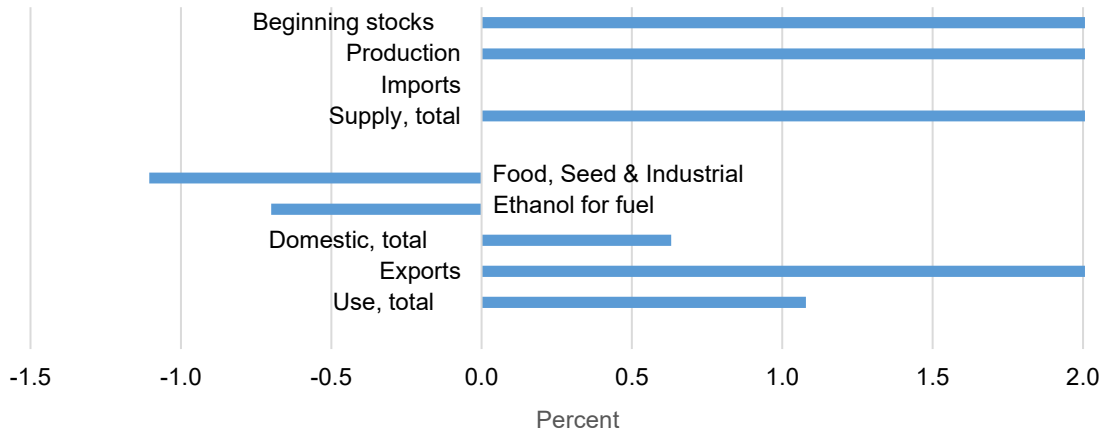
## Feed and Residual

Feed and residual use for the four feed grains (corn, sorghum, barley, and oats) and wheat for 2018/19, on a September-August marketing year basis, is projected at 143.6 million metric tons, 2.7 million below 2017/18. Declines were seen for corn and oats, while wheat feeding is projected to increase.

## Projected 2018/19 Supply Down From Last Marketing Year

The first projection for 2018/19 corn supplies indicates less corn available compared with last year. At 16,272 million bushels, supply is the third highest ever, but is 675 million bushels below last year's record high of 16.947 million. Beginning stocks are projected at 2,182 million bushels, 111 million below 2017/18. Production is projected at 14,040 million bushels, 564 million lower. Imports are unchanged from last year's estimate of 50 million bushels.

Figure 1  
**Corn supply and use: percent change from last month's forecast**

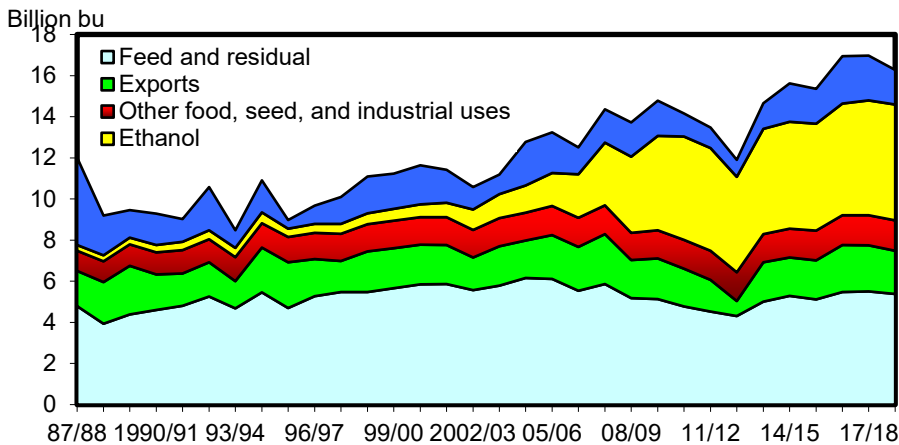


Source: ERS Feed Grain Database.

Corn planted acreage for 2018/19 is projected at 88.0 million acres, 2.1 million below last year, as reported in USDA's National Agricultural Statistics Service (NASS) *Prospective Plantings* report. Harvest acreage, adjusted based on historical silage and corn not harvested, is pegged at 80.7 million acres. Projected yield (based on a weather-adjusted trend assuming normal planting progress and summer growing season weather, estimated using the 1988-2017 time period) of 174.0 bushels per acre is 2.6 bushels below 2017/18's record high yield.

NASS's weekly *Crop Progress* report indicates 39 percent of the crop has been planted, compared with the 5-year average of 44 percent. Plantings in northern States such as North Dakota, South Dakota, and Minnesota have been set back by cold weather during April.

Figure 2  
**U.S. corn utilization**

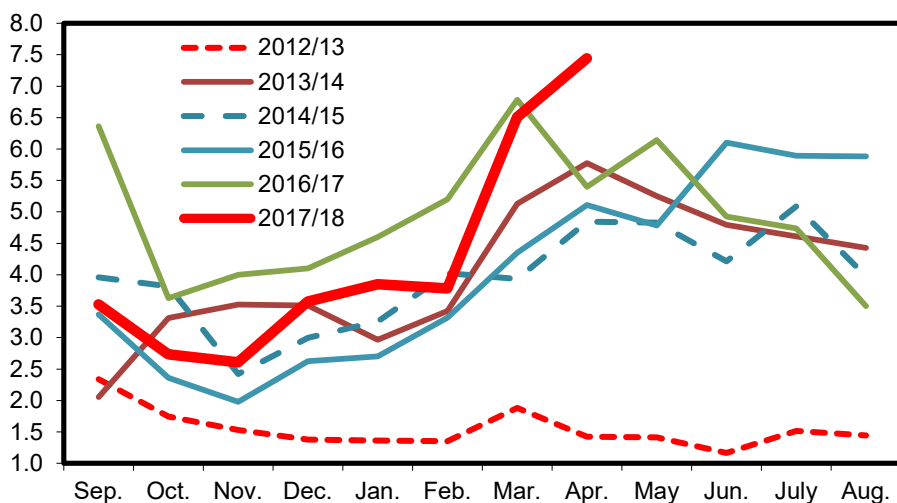


Note: Marketing year 2018/19 is projected.

## Disappearance Projected Lower

Total disappearance in 2018/19 is projected 175 million bushels lower than last year's record 14,765 million. Projected exports are 2,100 million bushels, 125 million below last year. Reduced exports from Argentina and Brazil during 2017/18 (local marketing years beginning March 2018 and ending February 2019) are expected to boost U.S. exports during the first half of 2018/19. However, a 265-million-bushel increase in the combined corn exports for Ukraine and Russia in 2018/19 will likely increase competition for the United States, reducing the forecast U.S. share of global corn trade from a year ago.

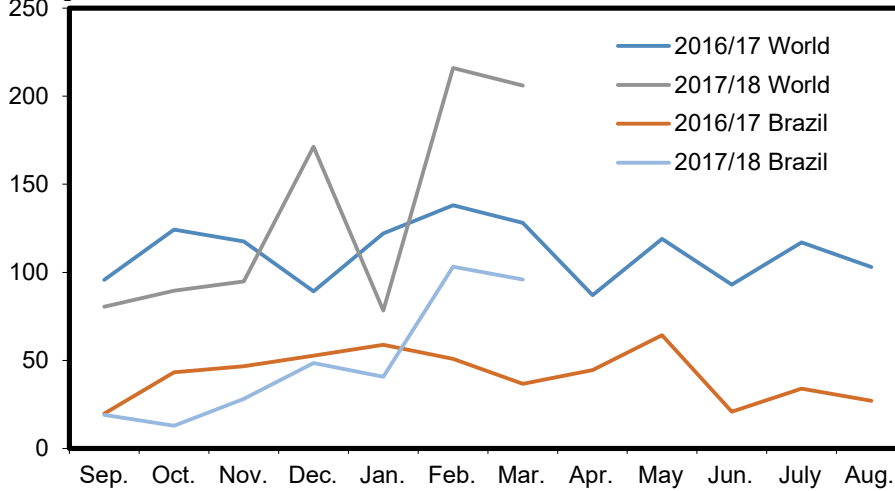
Figure 3  
**Monthly U.S. corn exports**  
 Million metric tons



Source: USDC, U.S. Census, April 2018 *Grain Inspections*.

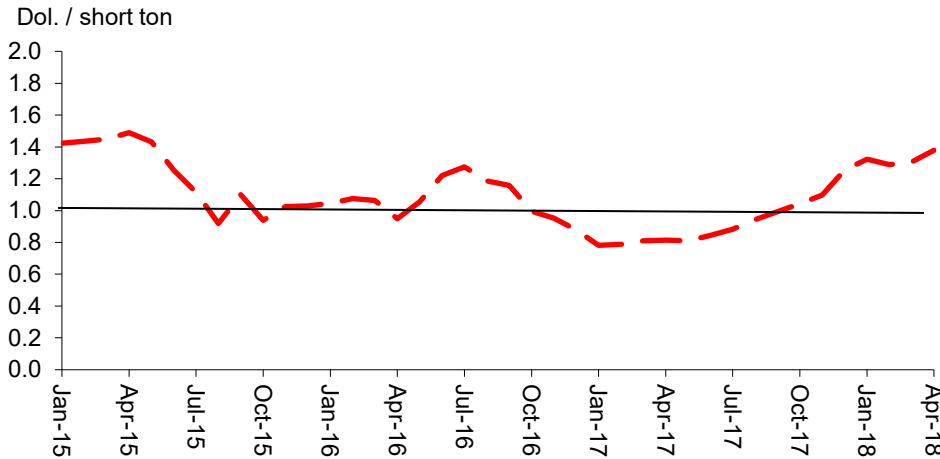
Food, seed, and industrial (FSI) use is projected 75 million bushels higher than last year at a record 7,115 million, compared with last year's 7,040 million. Within FSI, corn for fuel ethanol increased 50 million bushels to 5,625 million, glucose and dextrose increased 20 million to 400 million, and starch is projected 5 million bushels higher at 250 million. Feed and residual is down 125 million bushels in 2018/19 to 5,375 million on higher corn prices, a smaller crop, and increased use of byproduct feeds.

Figure 4  
**U.S. fuel ethanol exports**  
 1,000 gal.



Source: USDC, U.S. Census Bureau.

Figure 5  
**Monthly price ratio: Central Illinois distillers dried grain and corn**



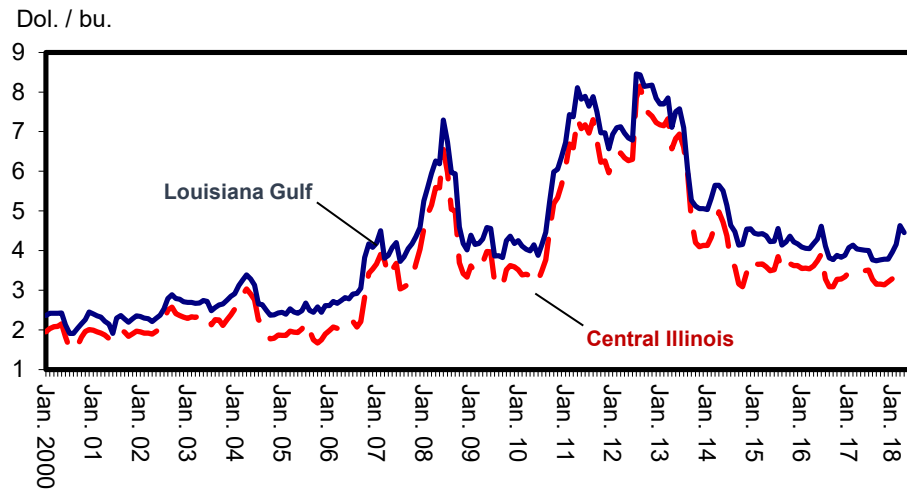
Sources: USDA, Economic Research Service, *Feed Grains Database* and USDA, Agricultural Marketing Service, <http://marketnews.usda.gov/portal/lg>.

Carryout is projected at 1,682 million bushels, 500 million below last year's 2,182 million. The resulting stocks-to-use ratio is 11.5, 3.2 below last year and the lowest since 2013.

## 2017/18 Price Projected Higher

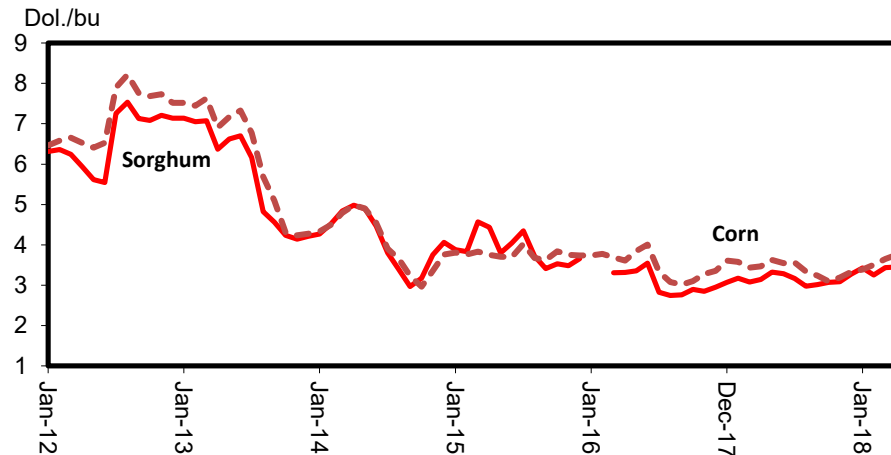
The projected average price received by farmers for 2018/19 is raised \$0.05 on each end for a range of \$3.25 to \$3.55 per bushel for a midpoint price of \$3.40 per bushel, based on market activity to date. For 2018/19, the range is projected at \$3.30 to \$4.30, for a midpoint of \$3.80 per bushel.

Figure 6  
**Monthly corn (yellow #2) prices for Central Illinois and Louisiana Gulf**



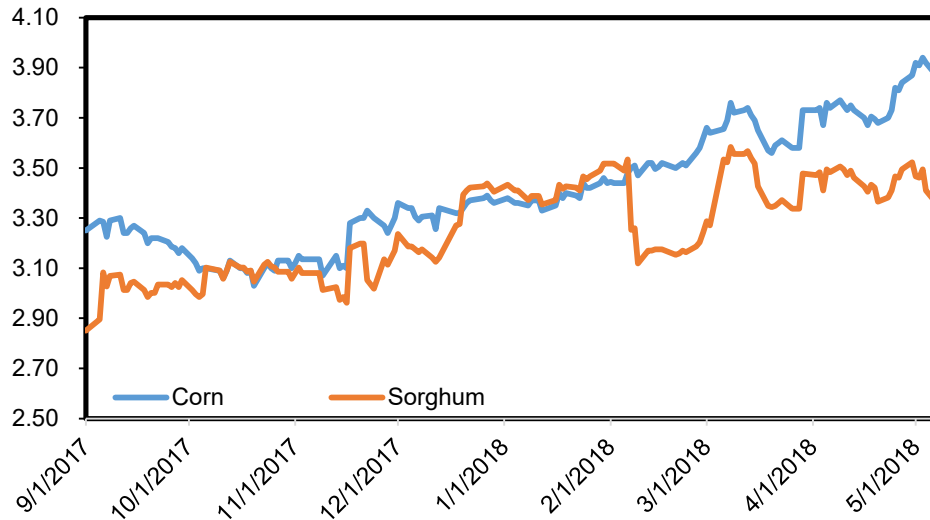
Sources: USDA, Economic Research Service, *Feed Grains Database* and USDA, Agricultural Marketing Service, <http://marketnews.usda.gov/portal/lg>.

Figure 7  
**Monthly yellow #2 grain sorghum and corn prices for Kansas City**



Sources: USDA, Economic Research Service, *Feed Grains Database* and USDA, Agricultural Marketing Service, <http://marketnews.usda.gov/portal/lg>.

Figure 8  
**Daily corn and sorghum prices, 2017/18 to date**



Source: USDA, Economic Research Service, *Feed Grains Database*.

## Corn-to-Sorghum Price Ratio Varies Based on China Import Policy

During the marketing year to date, the corn-to-sorghum price ratio has varied widely. From late December through February, sorghum was priced higher than corn in many markets. In the first week of February, sorghum prices fell from \$3.52 to \$3.25 in Kansas City on February 4 when China announced an anti-dumping probe of U.S. sorghum shipments. On April 17, when China announced a 179-percent tax on sorghum imports from the United States, effective April 19, the price response in interior markets was subdued, but sales at Texas ports virtually ceased.

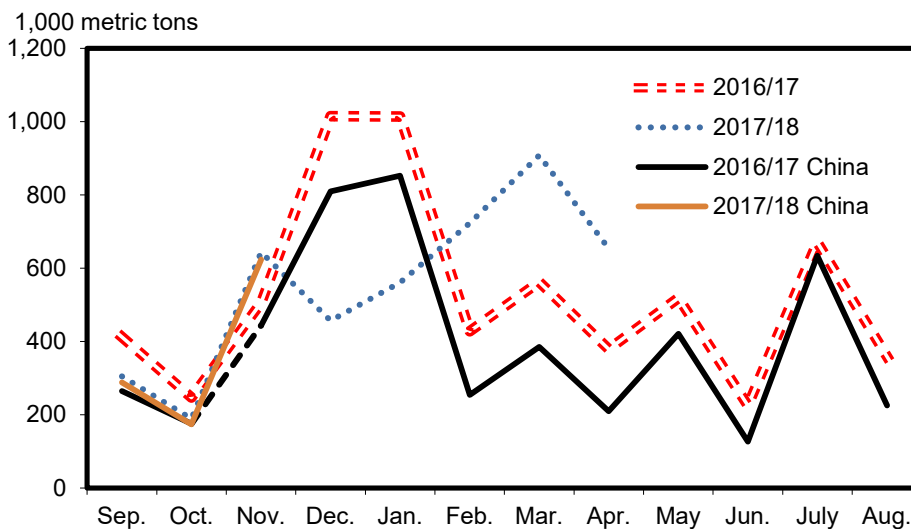
## Projected Domestic Sorghum Consumption Up as Exports Drop

The estimates for the 2018/19 season sorghum planted area are 5.9 million acres, of which 5.1 million are expected to be harvested. With a projected yield of 67.3 bushels per acre, this results in a production estimate of 343.0 million bushels of sorghum in 2018/19. Projected beginning stocks of 29.3 million bushels leads to a total supply projection of 372.3 million in 2018/19.

Domestic sorghum use in the 2018/19 season is expected to increase substantially by 55 million bushels to 180 million. Of this, 98 million bushels of domestic use are slated to be inputs for ethanol production, a roughly 54-million-bushel increase over the previous year.

Exports are expected to decrease by 80 million bushels in 2018/19 to 165 million. In addition, China is not expected to be a buyer of U.S. sorghum given the current policies in place. On February 4, 2018, China’s Ministry of Commerce began an anti-dumping investigation, which resulted in an April 18, 2018, decision to impose preliminary anti-dumping tariffs on all sorghum from the United States. This preliminary anti-dumping duty was at a rate of 178.6 percent, essentially stopping all U.S. sorghum exports to China.

Figure 9  
**U.S. sorghum exports**



Source: US Dept. of Commerce, U.S. Census Bureau, April 2018 *Grain Inspections*.

NASS’s May 7 *Crop Progress* report showed progress at the 5-year average for the 11 major sorghum-producing States. These States accounted for 99 percent of the domestic planted area dedicated to sorghum in 2017. The two exceptions where planting progress was ahead of the 5-year average were New Mexico and Texas, where slightly more sorghum was in the ground as of May 6 than the 5-year average for these particular States.

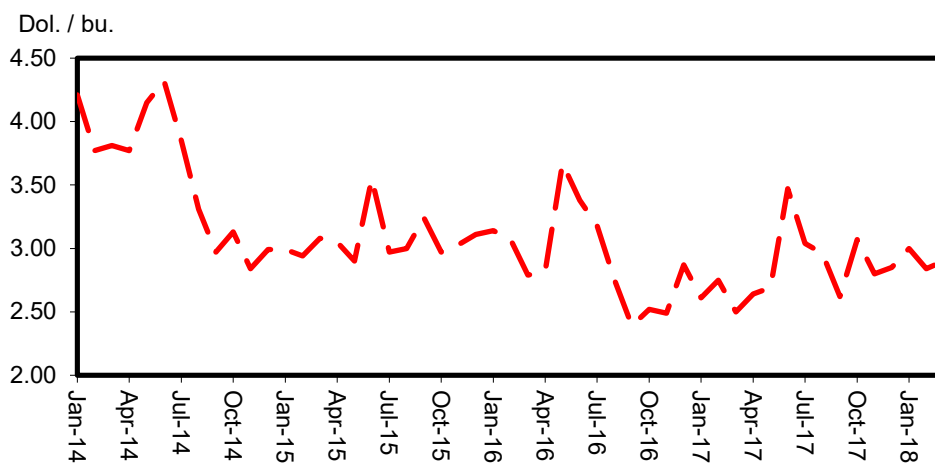
The projected range for the 2018/19 season-average sorghum price received by farmers is \$3.10 to \$4.10 per bushel, leaving the midpoint of \$3.60, \$0.40 higher than the prior year. Tight feed grain supplies and low sorghum ending stocks are behind the increase. The sorghum price is projected at about 95 percent of the price of corn, which is generally consistent with the 10-year average.



## Barley Supplies Projected Lower in 2018/19

Projected barley acreage, based on the NASS *Prospective Plantings* report, are 2.3 million acres, 0.2 million below 2017/18. Harvested area of 2.0 million acres is based on historical harvested-to-planted ratios. Yield is projected at 73.5 bushels per acre, based on historical trends and normal weather assumptions. If realized, resulting production is projected at 147.0 million bushels, 5.1 million below last year. Beginning stocks are the lowest since 2012/13 at 65.3 million bushels and with imports of 20 million bushels, total supply is projected at 232.3 million bushels, 26 million below 2017/18.

Figure 10  
**Monthly average barley prices received by farmers**



Source: USDA, Economic Research Service, *Feed Grains Database*.

## Barley Use Declines

Barley disappearance in 2018/19 is projected at 185 million bushels, 8 million below 2017/18. Previous to these 2 years, the low was in 2011/12. FSI use accounted for most of the loss as malt barley use is expected to decline. Department of Treasury data show a 3-percent decline in beer production through February, compared with the previous September-February period which, combined with tighter supplies of barley is driving lower FSI use. Feed and residual, at 25.0 million bushels, is unchanged from 2017/18. Exports are projected at 5 million bushels, based on expectations of increased shipments of feed barley with strong world market prices. Resulting ending stocks for 2018/19 are projected at 47.3 million bushels, 18 million below last season.

NASS's May 7 *Crop Progress* reported barley planting at 42 percent, substantially behind the 5-year average of 59 percent. Cool weather has persisted in the northern-most growing regions although planting has proceeded rapidly in the central Corn Belt. The average price received by farmers is projected to range from \$4.00 to \$5.20 per bushel, with a midpoint of \$4.60, \$0.10 above last year's price estimate of \$4.50.

## Oats Total Supply Up, Disappearance Down

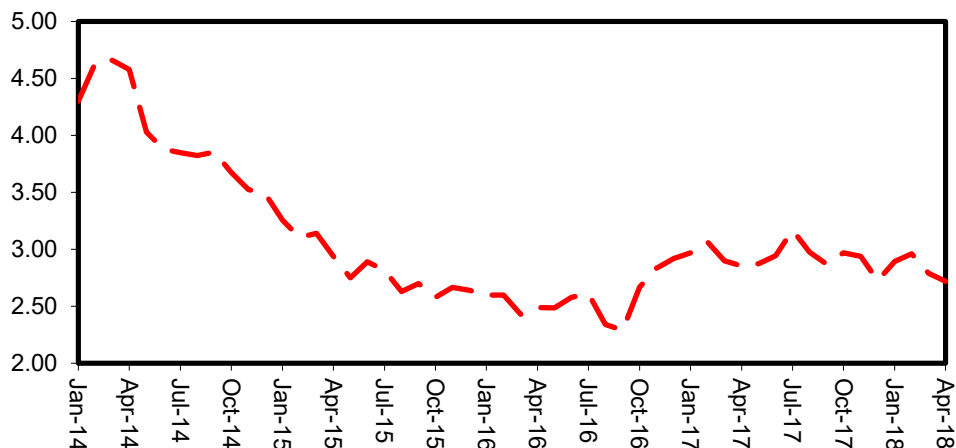
Oats area planted is expected to increase from 2.6 million acres in 2017/18 to 2.7 million in 2018/19. With this increase in area, the anticipated harvested acres increases to 1.0 million in 2018/19. Anticipated yield of 66.0 bushels per acre results in a production estimate of 66.0 million bushels for 2018/19. The expected total supply is projected down from the prior year to 182.2 million bushels, mostly due to beginning stocks for 2018/19 being significantly lower than in recent years at 21.2 million. This supply estimate includes higher anticipated imports from 87.0 million bushels in 2017/18 to 95.0 million in 2018/19.

Total disappearance for the 2018/19 season is projected down by 9.0 million bushels to 154.0 million. Feed and residual use is expected to decrease by 10.0 million bushels to 75.0 million. Additionally, exports are projected to decline to 2.0 million bushels. The projected range for the 2018/19 season-average oats price received by farmers is \$2.55 to \$3.15 per bushel for a midpoint of \$2.85 per bushel, up \$0.50 from 2017/18.

NASS's May 7 *Crop Progress* reported planting progress for nine States (Iowa, Minnesota, Nebraska, North Dakota, Ohio, Pennsylvania, South Dakota, Texas, and Wisconsin) at 56 percent complete, relative to the 5-year average of 74 percent. These States accounted for 67 percent of the domestic planted area dedicated to oats in 2017. Similarly, the 5 year average of oats emerged is 54 percent, but the report indicated only 34 percent emerged this year.

For 2017/18, imports remain unchanged from last month's estimates of 87.0 million bushels. Domestic total consumption remains unchanged at 163 million bushels. The projected price remains unchanged at \$2.55 per bushel.

Figure 11  
**Monthly average oat price: No. 2 white heavy, Minneapolis, MN**  
 Dol. / bu.

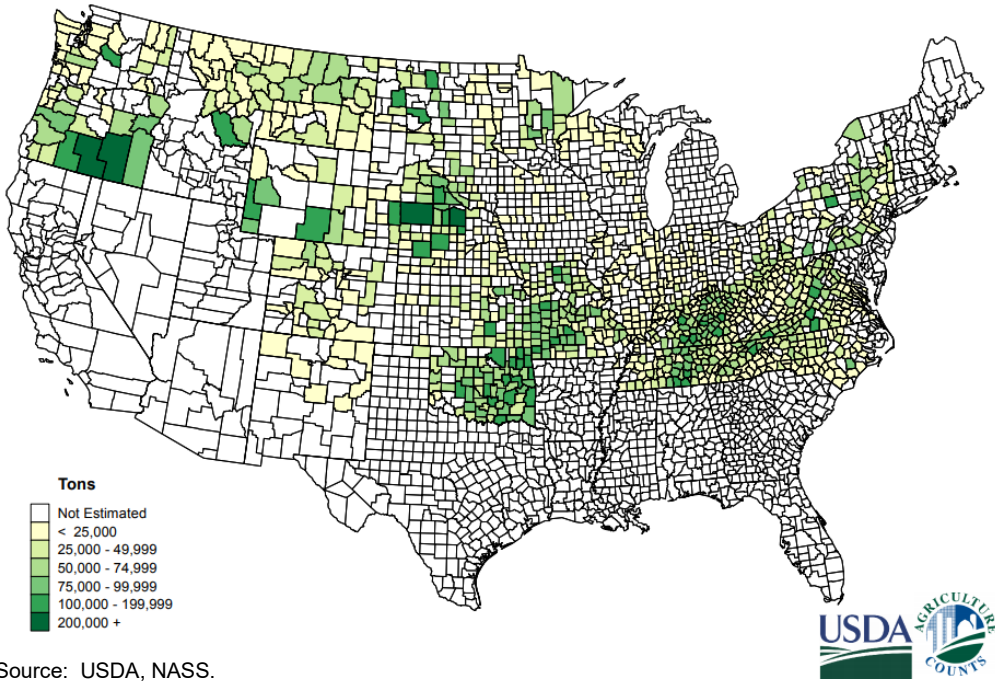


Source: USDA, Economic Research Service, *Feed Grains Database*.

## Hay Stocks Lowest Since 1950

May 1 on-farm hay stocks reported in NASS's May 10 *Crop Production* at 15.7 million short tons are the lowest since 2013 and are 36 percent lower than last year. December 1, 2017, stocks were reported at 86.3 million tons, indicating December-May disappearance of 70.6 million tons, 0.1 million less than last year. Producers indicated intentions to harvest 53.7 million acres of hay in 2018, compared with 53.8 in 2017. Prices for the 2017/18 marketing year are \$140 per ton, an increase of \$11 over last year's \$129 per ton.

Figure 12  
County level production of hay in 2016



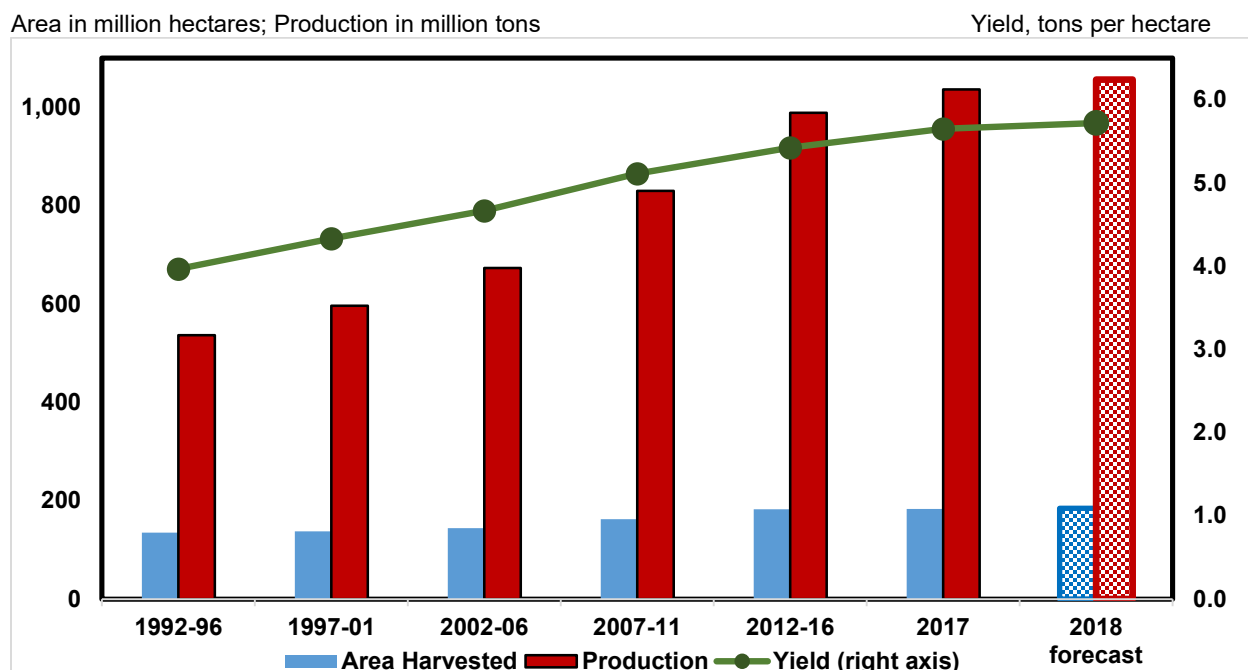
Source: USDA, NASS.

# International Outlook

## Foreign Coarse Grain Production Projected Higher

**Global** coarse grain production in 2018/19 is projected to reach 1,341.1 million tons, up almost 2 percent, or 24.4 million tons, from the previous year. While U.S. coarse grain production in 2018/19 is projected to slip 14.5 million tons, or 4 percent from a year earlier, **foreign** production is expected to increase by 38.9 million tons, or by more than 4 percent. Because spring planting is still underway in the Northern Hemisphere and is still months away in the Southern Hemisphere, where the 2017/18 crop is still being harvested, these projections are highly tentative.

Figure 13:  
World corn area, production, and yield: 5-year averages, 2017 and a forecast for 2018



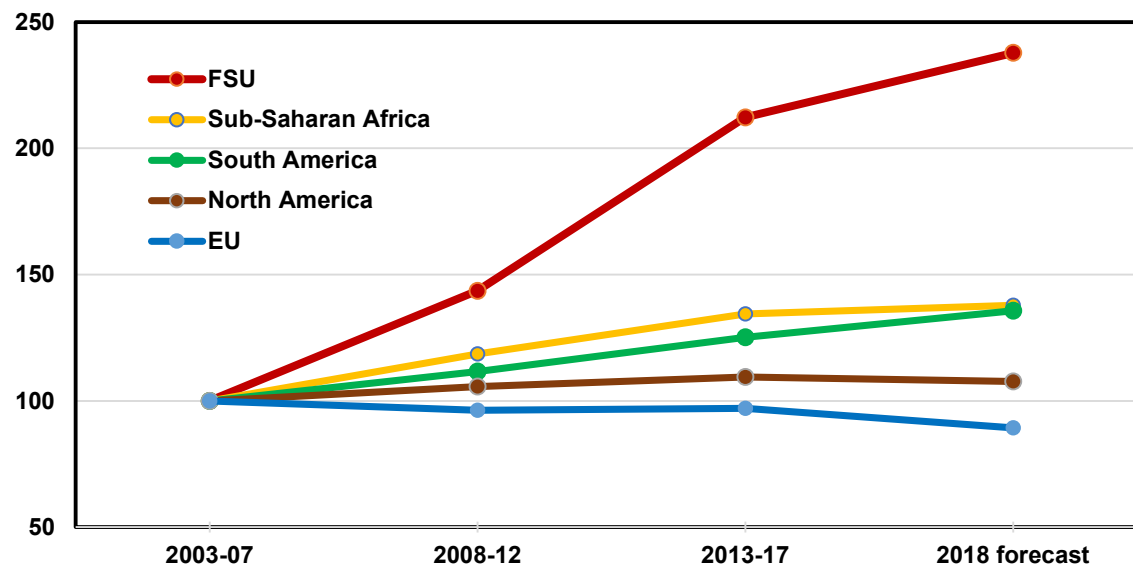
Source: USDA, Foreign Agricultural Service, Production, Supply, and Distribution database.

Global corn area is projected to stay virtually unchanged in 2018/19. In many countries, corn prices are attractive enough to maintain or expand area. Higher 2018/19 corn area is projected for Brazil, which continues to grow area for its second-crop corn; for Russia and Ukraine, which are moving further in the direction of improving their crop mix; and for China, where domestic prices for corn stay high supported by rising consumption. These increases are fully offset by area reductions in the United States and India, as well as in a number of other smaller countries.

Over time, corn area and yield change unevenly among the regions in the world, and the fastest to expand corn area by far are the two countries of the Former Soviet Union, Ukraine and Russia, which produced little corn in the past. After the early 1990s, when the former state and collective farms were forced to reorganize, a requirement to be self-financing and new decision-making freedom previously denied to them allowed these farms to shift area to more profitable crops, mainly corn, sunflowerseed, and soybeans, at the expense of rye, barley, oats, and pastures. The two countries became more integrated into the world agricultural economy, such that trade, foreign agricultural investment, and technology transfer all expanded. All these developments have helped to drive the expansion of corn area and yields (see figure 14). Both countries became major importers of hybrid corn seed, and their domestic seed industry is growing. These countries have become significant corn exporters, with the combined exports of both countries witnessing a fivefold increase over the last decade. Ukraine has become a major corn exporter, behind the United States, Brazil, and Argentina. In 2018/19, Ukraine and Russia are projected to produce 83.7 million tons of coarse grain, of which 49.0 million tons is corn and 26.0 million tons is barley.

Figure 14:

#### Corn area grows remarkably fast in the FSU region



Note: Index, 2003-07 = 100. FSU = Former Soviet Union.

Source: USDA, Foreign Agricultural Service, Production, Supply, and Distribution database.

See the feature for an examination of how crop area and mix have changed in Russia and Ukraine since these countries began the move to market economies in the early 1990s.

## COUNTRY FOCUS

### Major Changes in Russian and Ukrainian Crop Area During Economic Transition

*By William Liefert*

From the beginning of **Russia's** transition to a market economy in the early 1990s through 2001-05, Russian planted area fell substantially. Although area for wheat and corn remained fairly steady, and that for oilseeds rose, area for other grains and crops other than oilseeds dropped considerably. A key reason for the area decrease was the major contraction of the livestock sector, which reduced the country's demand for animal feed (Liefert and Liefert, 2012). During the 1990s, the severe drop in subsidies to agriculture, which favored the livestock sector, led to a decline of more than half in both livestock herds and product output (meat and dairy goods).

Since 2005, both total area and total grain area (planted) have changed only modestly. However, changes involving specific crop groupings occurred. Area for other grains and other crops (that is, not covering wheat, corn, or oilseeds) continued to fall, area for wheat rose moderately, and area for oilseeds (mainly sunflowerseed) and corn more than doubled (from 2001-05 to 2016-17).

A major reason for the area growth for corn and oilseeds is the revival of the livestock sector, especially poultry, which has increased domestic demand for feed. From 2000 to 2017, Russian total meat output rose by almost 150 percent to 8.3 million metric tons (mmt), and poultry broiler production rose by 875 percent. The increase in wheat area can be largely attributed to the country becoming a major exporter, the main foreign markets being in the Middle East and North Africa. In 2016-17, Russia exported on annual average 33 mmt of wheat, accounting for 18 percent of total world sales.

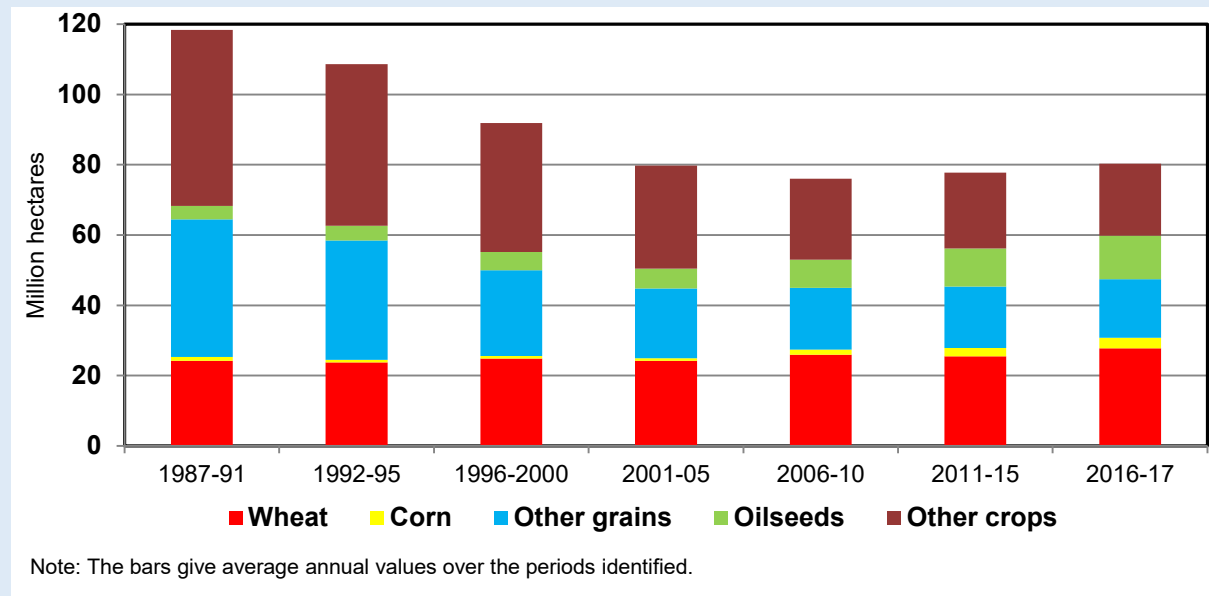
Since 2000, Russia's production of wheat, corn, and oilseeds (again mainly sunflowerseed, though soybean and rapeseed output is also increasing) has grown substantially, fueled by growth in not only area but also yield. The rise of "new operators" in Russian agriculture (see Rylko et al., 2008), including large vertically integrated agrohholdings, have apparently helped generate farm level improvements in management and adoption of superior technology and production practices, including the use of imported machinery and seeds (such as hybrid corn

and sunflower seed). Superior farm management also played a role in the reallocation of area to more profitable crops, almost extinguishing oats and rye.

Russian grain area in 2016-17 was 27 percent below the level in 1987-2001 (average annual) and 41 percent below that in 1961-65 (after Russia expanded cultivation under its “Virgin Lands” campaign). Some observers, both inside and outside of Russia, argue that the country could return much of that abandoned land to grain production and thereby further increase output and exports considerably. However, Uzun et al. (2014), Liefert and Liefert (2015), and Meyfroidt et al. (2016) counterargue that most of the abandoned land was in marginal regions in the north and east of the country with high production costs, while some of the previous grain area in the country’s better agricultural districts has been switched to oilseeds production. Although there is probably some potential for Russian grain area to increase somewhat (some additional area can still go to corn production), a return to the area level of the late Soviet period, much less to that of the early 1960s, would require that world grain prices rise substantially (probably more than double) to cover the high cost of producing in those remote and marginal regions. See figure A.

Figure A

**Russia: Planted crop area**



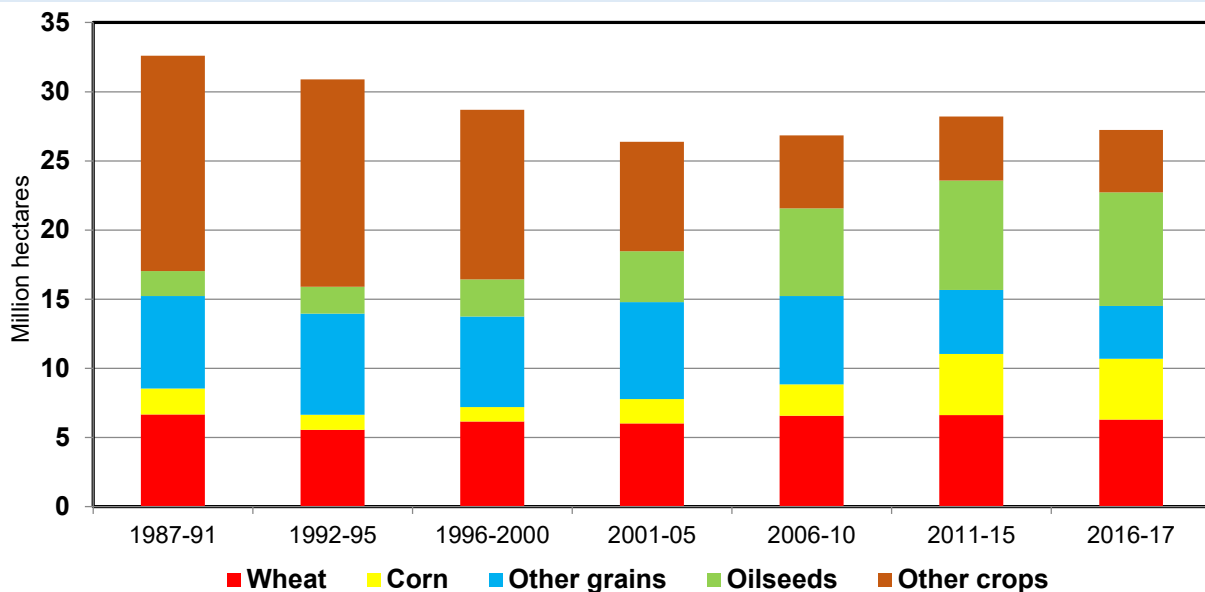
As in Russia, total planted crop area in Ukraine fell from the late Soviet period to the early 2000s, though not by as much. Most of the decline came in crops other than grain and oilseeds (potatoes, beets, vegetables). Area for wheat, corn, and other grains changed only modestly, while area for oilseeds about doubled.



Since 2005, area in Ukraine for grain other than wheat and corn, as well as for crops other than grain and oilseeds, both dropped considerably. On the other hand, area for oilseeds (again mainly sunflowerseed) and corn has more than doubled since 2001-05. Since the move to a market economy in the early 1990s, Ukrainian wheat area has been fairly stable, not straying far from 6 million hectares.

As in Russia, rising crop production since 2000 has made Ukraine a major grain exporter—the fourth largest of corn (on par with Argentina), the fifth or sixth largest (depending on the year) of wheat, and a top exporter of sunflowerseed oil. In 2016 and 2017, Ukraine exported 21 mmt (annual average) of corn, 14 percent of the world total. Although area expansion has been a factor behind the increase in Ukraine’s production and exports of corn and oilseeds, the main driver of the large growth in Ukrainian crop output since 2005 has been yields. Similar to Russia, new types of agricultural producers (operators) have apparently played a key role in the rise in farm productivity, yields, and output, taking advantage of new technologies (seeds, fertilizer, machinery) and the best black soil in the world. These producers recognized that higher profit could be earned by switching to such crops, procured the inputs (such as seeds and machinery, again often imported), and made the farm-level adjustments necessary to change their crop area and production mix.

Figure B  
**Ukraine: Planted area**



Note: The bars give average annual values over the periods identified.

Liefert, W.M., and O. Liefert (2012). "Russian Agriculture During Transition: Performance, Global Impact, and Outlook." *Applied Economic Perspective and Policy* 34(1), 37–75.

Liefert, W.M., and O. Liefert (2015). "Russia's Potential to Increase Grain Production by Expanding Area." *Eurasian Geography and Economics* 56(5), 505-523.

Meyfroidt, P., F. Schierhorn, A.V. Prishchepov, D. Müller, and T. Kuemmerle (2016). "Drivers, Constraints and Trade-offs Associated with Recultivating Abandoned Cropland in Russia, Ukraine and Kazakhstan." *Global Environmental Change* 37, 1-5.

Rylko, D., I. Khramova, V. Uzun, and R. Jolly (2008). "Agroholdings: Russia's New Agricultural Operators." In *Russia's Agriculture in Transition: Factor Markets and Constraints on Growth*, ed. Z. Lerman, 95-133. Lanham, MD: Lexington Books.

Uzun, V., V. Saraikin, E. Gataulina, N. Shagayda, R. Yanbykh, S. Mary, and S. Gomez y Paloma (2014). *Prospects of the Farming Sector and Rural Development in View of Food Security: The Case of the Russian Federation*. Scientific and Technical Research Reports, European Commission.

*For more information on changing crop area in Russia and Ukraine, see Liefert, W., and O. Liefert, "Changing Crop Area in the Former Soviet Union Region." Outlook Report FDS17b-01, ERS, USDA, 2017.*

High prices for sorghum and barley, supported by strong demand from China (see feature on China below), provided an incentive for area expansion throughout the world, leading to an increase in projected foreign sorghum and barley area and output. Several major producers, such as Australia, Argentina, Kazakhstan, Russia, and Turkey, are expanding barley area, mainly at the expense of wheat. Sorghum area is expected higher in Australia, India, and two main African sorghum producers—Burkina Faso and Sudan.

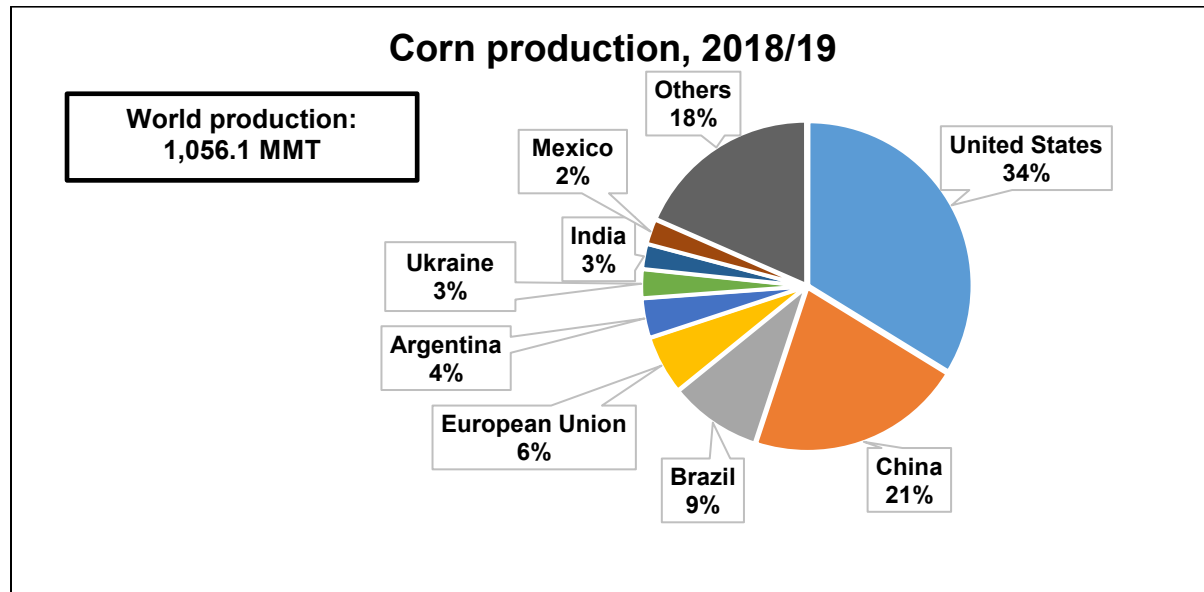
An assumed return to trend from low yields of 2017/18 for Brazil, Argentina, Ukraine, and a number of other countries push foreign yields for corn up. On the other hand, barley, oats and rye yields are projected lower mainly due to the Russian retreat to trend from a bumper year.

Global corn production is dominated by eight countries (regions) that produce more than 80 percent of the world's corn. The United States is the top producer, though its world output share that used to be slightly above 40 percent has stayed under 35 percent since 2010. During the

same period, the combined share of Brazil and Argentina has increased from 10 to 13 percent, see figure 15.

Figure 15:

**World corn production by country (shares)**

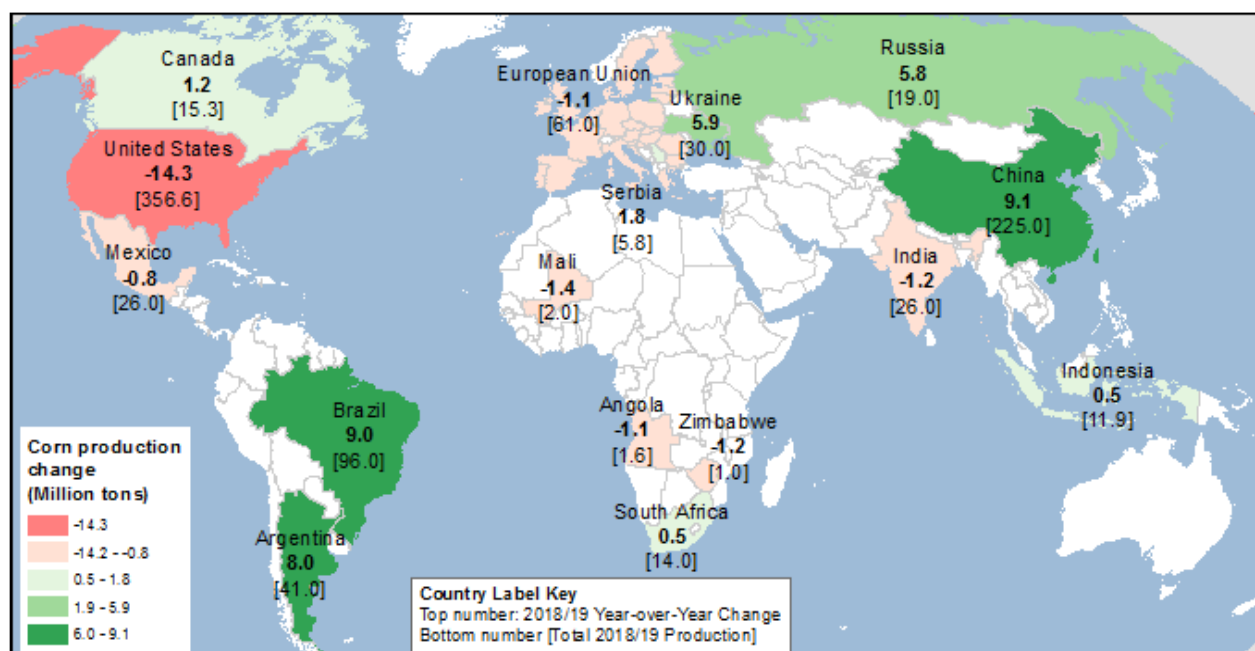


Source: USDA, Foreign Agricultural Service, Production, Supply, and Distribution database.

USDA monitors production of various commodities in 80 countries, the data being recorded and continuously updated by the Foreign Agricultural Service (FAS) and reflected in the Production, Supply, and Distribution database. The most important developments in the new forecast for major commodities are published in the FAS **“World Agriculture Production”** report.

Map A below visually presents the forecast for major corn producers and year-over-year changes in projected corn output.

## Map A: Major changes in corn production for 2018/19



Source: USDA, Foreign Agricultural Service, Production, Supply, and Distribution database.

The **South America region**, one of the most dynamic and fast-growing corn producers in the world, is forecast to produce 161.8 million tons of coarse grains in 2018/19, 18.6 million tons higher than in 2017/18. Corn is the region's dominant grain, and **Brazil** is expected to increase corn area further to record highs, while **Argentina** is forecast to reduce its record-high corn area fractionally with an expansion expected in soybean area. Both countries' trend in corn yields is strong, but both are also prone to extreme, sometimes adverse, weather conditions that affect yields. A return to trend yields after a disappointing 2017/18 year for both countries takes Brazilian corn production up by 9.0 million tons to 96.0 million, while Argentine corn output is projected 8.0 million tons higher to reach 41.0 million. Brazilian farmers are expected to continue to expand area of their low-cost second-crop (safrinha) corn, given the currently large pool of land available for double cropping with soybeans in the Center-West, and the growers (especially large farms) are beginning to invest more into improving productivity and limiting a weather-related risk. The first-crop corn area, which is about one-fourth of total planted area, keeps declining, but this decline does not usually offset the expansion of safrinha area where there are few limitations on area expansion in the Center-West.

Coarse grain production in **China**, the largest foreign producer of coarse grains, is expected to increase 9.4 million tons in 2018/19 to 232.8 million tons, with higher area and record-high projected yields. China is forecast to increase area planted to corn by almost 3 percent (1.1 million hectares). China eliminated Government support for corn, followed by a sharp decline in corn prices and lower 2017/18 corn area. To counter the decline in corn prices, the Government has been providing support to feed producers and industrial processors to stimulate higher usage of domestic corn. Domestic corn prices have strengthened since last year, supported by growing demand for feed and industrial use, and are currently considerably higher than world prices. This year, corn is gaining area, recouping almost all last year's decline.

Coarse grain production in the **European Union (EU)** is projected up 1.4 million tons to 154.4 million in 2018/19, with unchanged area. Higher barley output in the countries that suffered from hot, dry summer conditions in 2017/18 (such as Spain) and that are presently enjoying excellent growing conditions are partly offset by slightly lower corn production (lower corn output in France and Romania is partly counterbalanced by projected growth in some countries of Eastern Europe).

Coarse grain production in **Sub-Saharan Africa** is projected down 4.0 million tons to 110.2 million. The largest decline is forecast for Angola, where dryness since January has reduced yields, and for Mali, where yields are back to trend after the record year for corn and sorghum. The largest corn producer, South Africa, is projected to have a crop of 14.0 million tons, 0.5 million up from the previous year. Corn output in Niger, Malawi, Uganda, Zambia, and several other Sub-Saharan countries is expected to decrease, with area declines for some countries and lower yields (or both) for others.

In **India**, where most coarse grains but corn are used for food, a year-over-year reduction in production of 1.1 million tons is expected in 2018/19 with a return to trend yields. While 2017 monsoon rains secured good conditions for last year's summer crops, the 2018 monsoon expected to begin in September will be critical for the current production forecasts.

## Changes in the World 2017/18 Coarse Grain Production

Global coarse grain production in the current year 2017/18 is forecast at 1,316.7 million tons, up 1.7 million this month. A relatively small upside change is a result of a substantial cut in corn output in Brazil and a downward multiyear revision (back to 2003) for Iran, while a collective change in coarse production for the European Union and the countries of Sub-Saharan Africa more than offset the reduction.

While 2017/18 harvests in the Northern Hemisphere were generally completed months ago, important Southern Hemisphere crops are still growing. Brazil's 2017/18 second-crop corn is going through key reproductive stages. Extensive dryness is hurting yield prospects in southern Brazil, with very unusual dryness in Parana at this time of the year. April 2018 was extremely dry with virtually no precipitation in both Parana and Mato Grosso do Sul, the two states that produce about a third of second-crop corn in the country. In central Brazil, specifically the states of Mato Grosso and Goias, the rains have ended earlier than expected. These states have not had any rain since mid-April, although before the termination of rains they accumulated excellent soil moisture that could support crop development for a couple of weeks. With crop ratings dropping every week, the forecast for the average corn yield is reduced 5.6 percent, while corn production is cut 5.0 million tons to 87.0 million.

A multiple year downward revision of Iranian corn area leads to a reduction of corn output since 2003/04. Iranian 2017/18 corn crop area is reduced 1.3 million tons to just 1.2 million. The reductions are based on the Food and Agriculture Organization of the United Nations reports confirmed by satellite imagery.

EU 2017/18 coarse grain production is increased 1.4 million tons to 153.1 million, mostly due to higher reported corn production, which is up 1.0 million tons to 62.1 million, with the rest of the increase coming from barley.

Sub-Saharan Africa's production projections and prior year estimates are carefully reviewed by the USDA interagency committee twice a year, and this month included such a review. Coarse grain production for 2017/18 is estimated up 5.0 million tons to 114.3 million, a large, but not record, level. For 2016/17, record production is boosted 3.5 million tons to 116.9 million, a bumper crop. The largest 2017/18 coarse grain production change is for Mali, up 1.9 million tons to 6.8 million, with record corn and sorghum yields. In Angola, where corn is the main crop, production is also up 1.1 million tons to 2.7 million. Ethiopian 2017/18 coarse grain production is up 0.9 million tons to 14.2 million, with more than half of the increase in corn due to a sharply increased yield; the rest of the upward revision for this country is in sorghum and millet. Partly offsetting the increases are reductions for Sudan, with lower sorghum output because of sharply decreased area. There are multiple mostly upside changes to 2017/18 coarse grain prospects for Burkina, Cameroon, Chad, Malawi, Mozambique, Niger, Nigeria, South Africa, Uganda, and Zambia.

## World Coarse Grains Use To Grow Modestly in 2018/19

The growth in coarse grain consumption is projected to be around 2 percent, partly owing to higher corn and barley consumption in China (though with lower sorghum use), increased feed and residual use in Brazil and Argentina (the increase is correlated with a larger crop), and higher consumption (mainly sorghum) in the United States.

Foreign feed and residual use of coarse grain is forecast to grow by 2.7 percent in 2018/19 to a record 687.7 million tons, generally consistent with the growth rate of just under 3 percent seen over the past two decades. In China, the largest coarse grain feeder in the world, the price structure for feed grains, particularly in the feed-deficit South, creates strong incentive for feed mills to use imported feeds. At the same time, the **Chinese** policies of supporting corn feed producers and recently imposing high tariffs on imported sorghum encourages a shift to corn and imported barley in feed rations, at the expense of sorghum whose consumption is sharply reduced. China is expected to feed almost 2.4 million tons more coarse grains (5.0 million tons more of corn, 0.7 million tons more of barley, although 3.3 million tons less sorghum). An increase in animal numbers is expected in many countries, as GDP growth (rising populations and growing productivity) supports higher per capita consumption of animal protein, and feeding is adjusted accordingly.

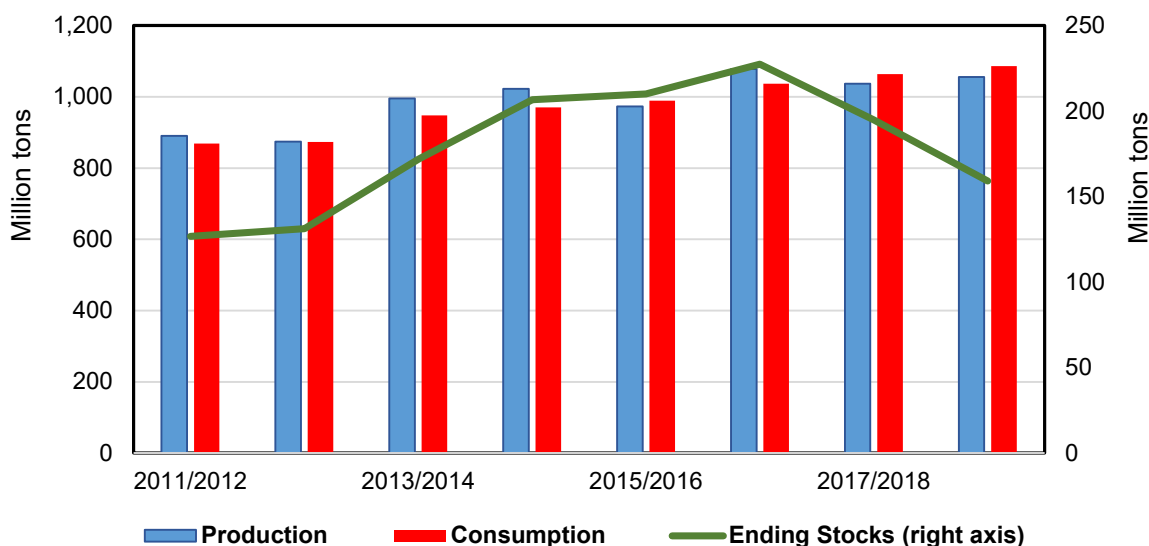
Foreign food and industrial use (FSI) of coarse grains is forecast to grow by 4.0 million tons, or just under 1.0 percent, in 2018/19 to 355.9 million tons. Expansion in China of the corn processing industry, for both domestic use and exports, promotes increased corn use. Chinese FSI use of coarse grains is expected to be up 3.2 million tons, slightly more than the increase in total foreign FSI, as other countries' changes are largely offsetting.

Main trends in the world balance and trade for grains are presented in the Foreign Agricultural Service report "***Grain: World Markets and Trade.***"

## China Leads Coarse Grain Stocks' Decline

With coarse grain production forecast to be lower than consumption for the second consecutive year, projected world ending stocks for 2018/19 are down 37.2 million tons from a year earlier to 185.5 million, with a major reduction coming from corn, a little bit from sorghum and barley, while oats stocks are forecast slightly higher. Corn stocks are projected to decline over the year by 35.7 million tons, the lowest level since 2012/13. With a 13.1-million-ton decline in U.S coarse grain stocks, foreign stocks are projected down by 24.2 million.

Figure 16:  
**World corn production and consumption**



Source: USDA, Foreign Agricultural Service, Production, Supply, and Distribution database.

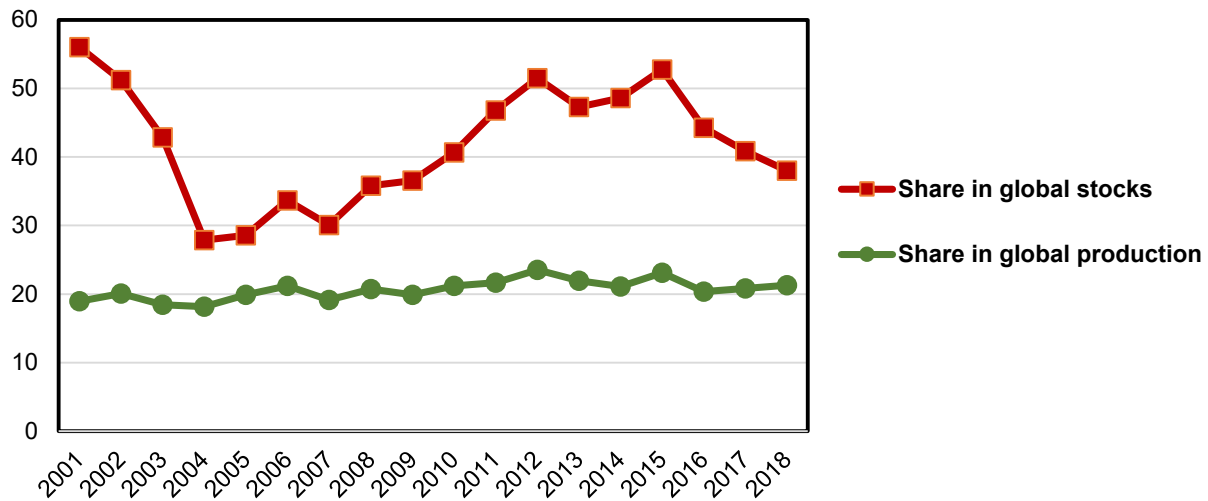
A decline in foreign corn stocks is driven mainly by China, where a substantial drop of 24 percent, or 19.1 million tons, is projected. China's share in world corn stocks is projected to fall to 38 percent from almost 53 percent 3 years ago (2015/16), before the policy reforms aimed at reducing large Government-owned corn stocks began to unravel. Nonetheless, during the mid-2000s, China's share of total stocks fell to as low as 28 percent; moreover, China's share in world stocks is still much higher (almost double) than its share in global corn output. A previous decline in corn stocks occurred after China joined the World Trade Organization in 2001 (see figure 17).

Coarse grain stocks are projected down 2.0 million tons to 3.5 million in Mexico and 1.2 million tons lower in South Africa. Ending stocks are also projected 1.0 million tons lower in Brazil and up 1.0 million up in Argentina. Declines are expected for the EU and several other countries.



Figure 18:

**China: share in global corn stocks is still almost twice the share in corn output**



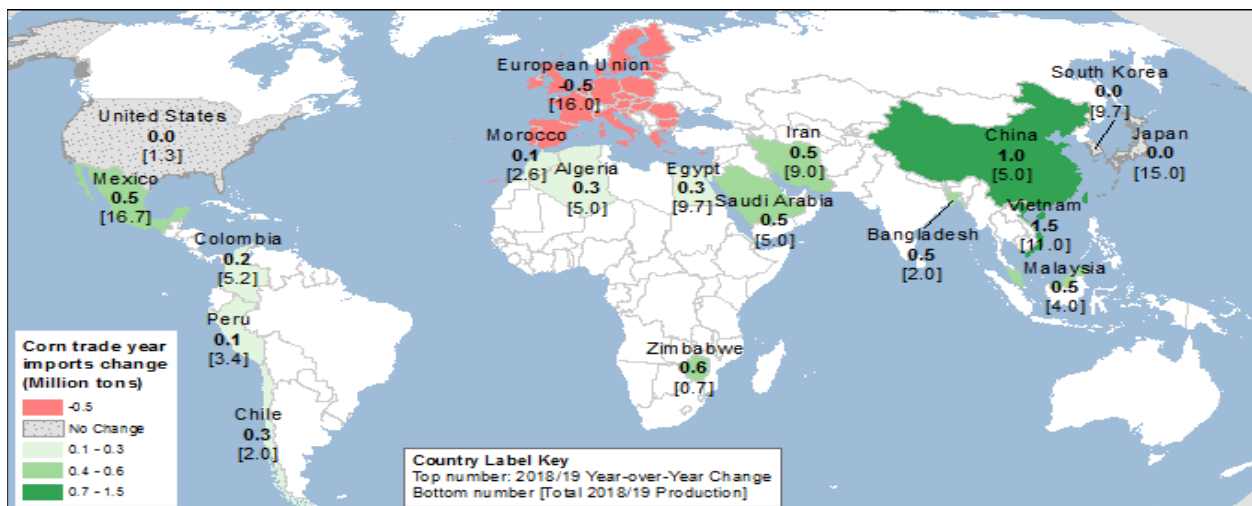
Source: USDA, Foreign Agricultural Service, Production, Supply, and Distribution database.

China has been strongly affecting the functioning of global grain markets. For a discussion of the importance of China in the global grain economy, see the feature below.

**U.S. 2018/19 Corn Export Prospects Face Tough Competition**

Global corn trade in October-September 2018/19 is projected to reach 157.6 million tons, up 7.3 million from the corn trade forecast for 2017/18. Expanding meat production is the main driver for higher corn imports in most corn-importing countries. The map below provides a quick look at the size and the year-over-year changes in corn imports.

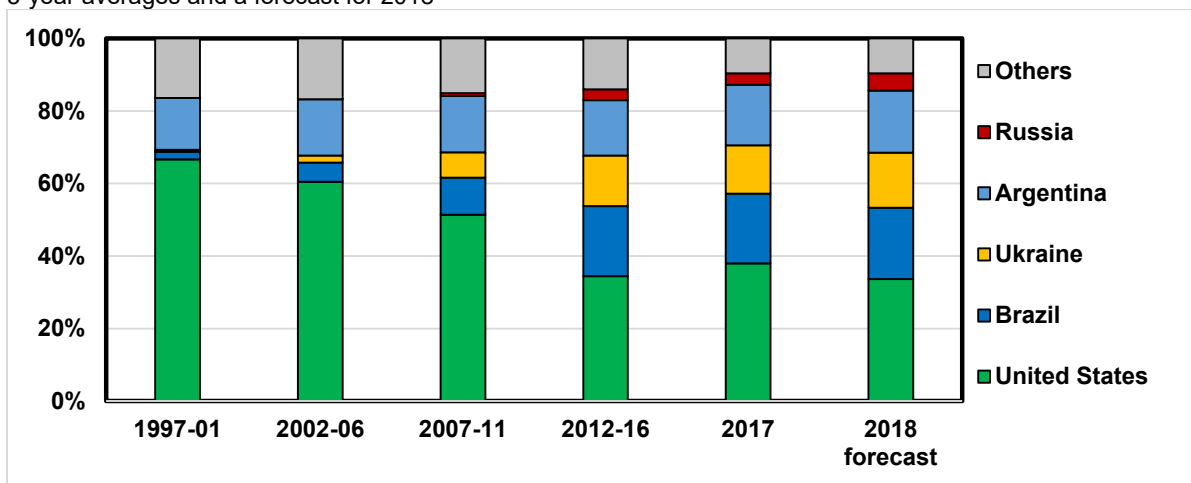
**Map B Major changes in corn imports for 2018/19**



Source: USDA, Foreign Agricultural Service, Production, Supply, and Distribution database.

Ample supplies in most exporting countries in 2018/19 are expected to support strong competition and limit price increases. The shift in global corn production and exports in favor of **South American** and the **KRU** (mostly Ukraine and Russia) countries altered global trade, with the U.S. share of world corn trade trending lower (see figure 19). In 2018/19, Brazilian and Argentine corn production combined is expected to be 17.0 tons higher, and Ukrainian and Russian joint corn output is forecast to rise by almost 12.0 million, while the outlook for corn production in the United States is a 14.3-million year-over-year reduction. The trade implications are as follows: the combined exports of Brazil, Argentina, Ukraine and Russia are expected to rise by almost 11.0 million tons, as virtually all of next year's surplus is going to be exported, while U.S. exports are expected to take a 4.0-million-ton cut.

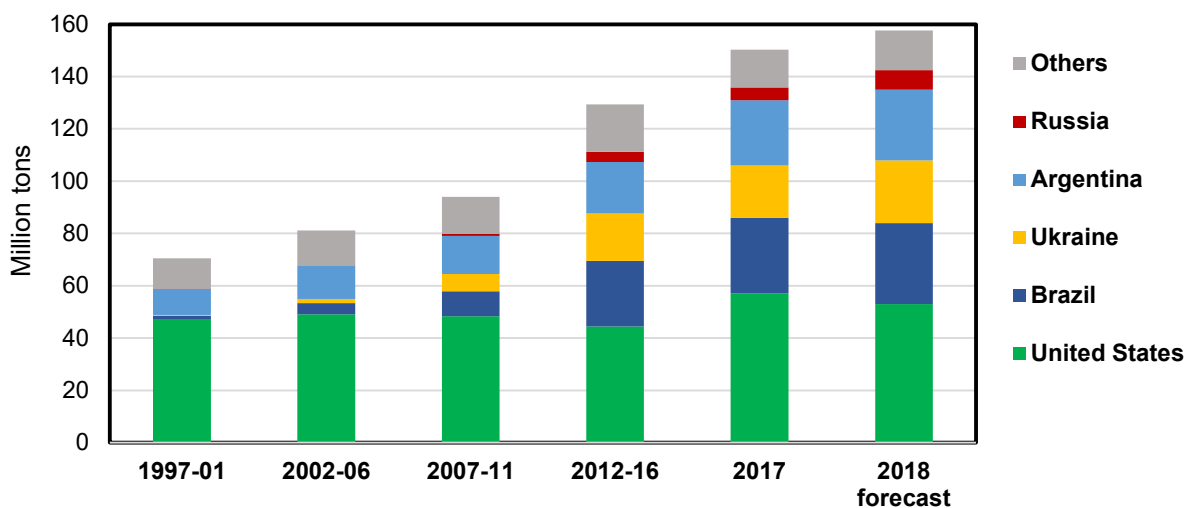
Figure 19:  
**Corn exports shares of major competitors**  
 5-year averages and a forecast for 2018



Source: USDA, Foreign Agricultural Service, Production, Supply, and Distribution database.

World demand for corn has been growing at a steady robust pace, mainly in line with per capita GDP growth, which is correlated with meat consumption. However, the steady growth in global corn trade has been increasingly captured by South American producers (Brazil and Argentina), Ukraine, and Russia. Meanwhile, the United States continues to export more or less a steady amount of around 50-55 million tons of corn, with some variation depending on the U.S. and competitors' weather conditions, policies, and currency fluctuations.

Figure 20:  
**Growing corn demand captured by U.S. competitors**  
 5-year averages and a forecast for 2018



Source: USDA, Foreign Agricultural Service, Production, Supply, and Distribution database.

Higher export volumes come with a re-distribution of importers. During the last several years, Brazil, Argentina, Ukraine, and Russia expanded their outreach to partly (and sometimes fully) replace the United States in multiple corn markets. A good example is Egypt, one of the world's top corn importers, which used to import the bulk of its corn from the United States. For several years now, Egypt has imported very little corn from the United States, having shifted most of its business to Brazil, Argentina, and Ukraine. A similar story happened with Morocco and Algeria.

To get a better picture of the important changes and shifts in the world wheat trade flows, see below the diagrams of wheat trade export flows from Brazil, Ukraine, and the United States since 2005. The diagrams depict the 5-year average trade flows for the 2005/06—2009/10 trade years (October-September), overlaying them with the average flows for the recent 3 years 2014/15-2016/17. The current 2017/18 year is not yet over, and the final results will become available in the fall. The diagrams visually convey the changes that took place in the wheat export markets: the volume and destinations (importers) of wheat as well as the importers' mix.

Diagram 1/3

**Brazil: Corn export flows for 2005-09 (yearly average) and for 2014-16 (yearly average)**

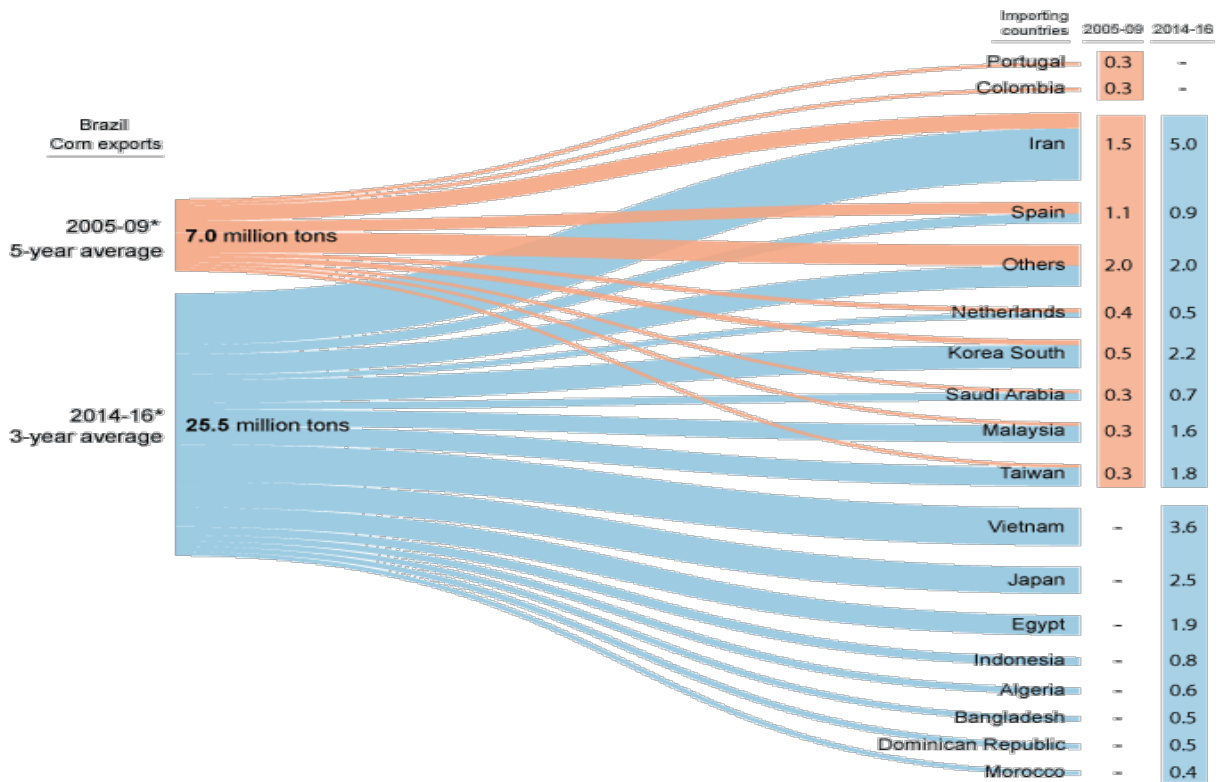
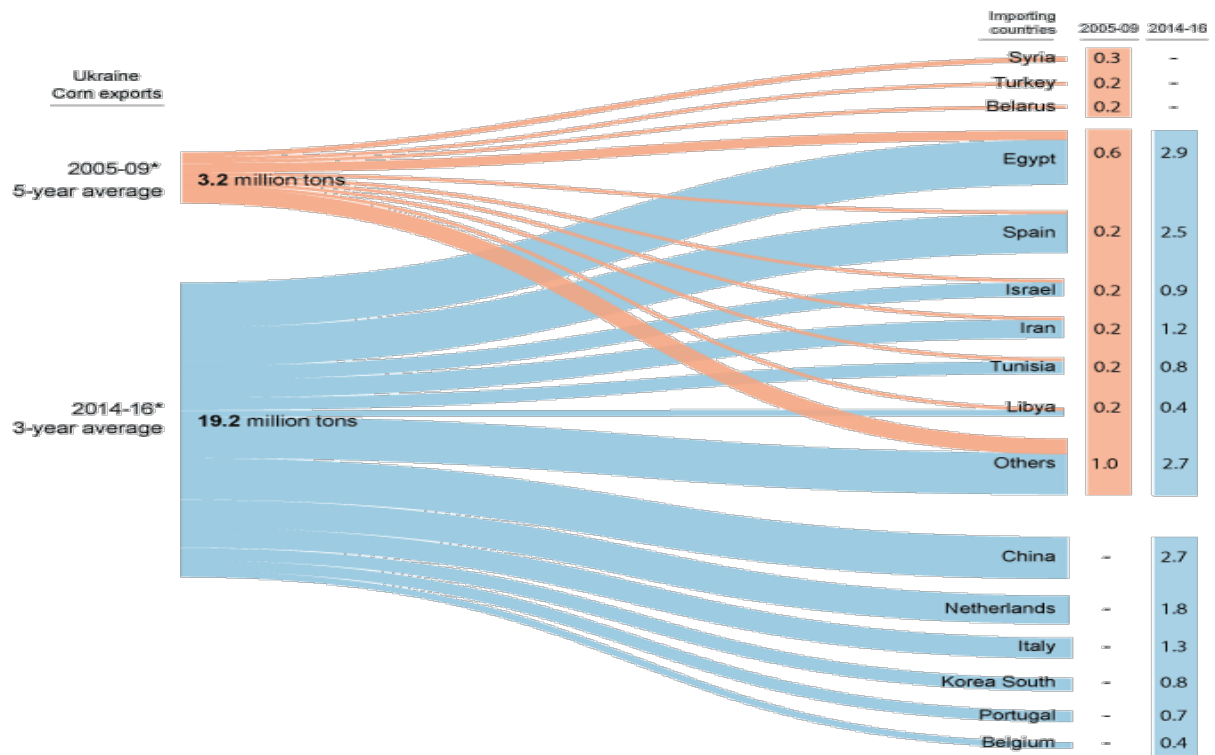
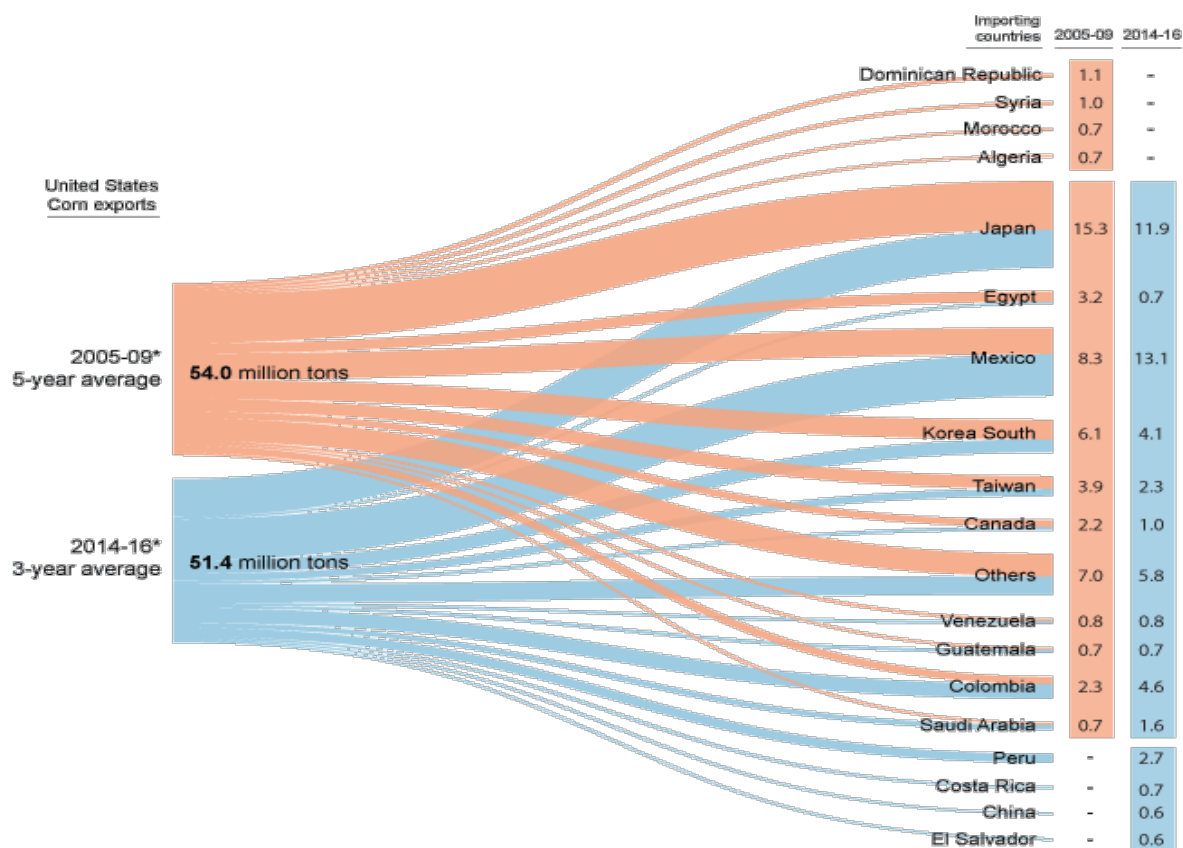


Diagram 2/3

**Ukraine: Corn export flows for 2005-09 (yearly average) and for 2014-16 (yearly average)**



**United States: Corn export flows for 2005-09 (yearly average) and for 2014-16 (yearly average)**

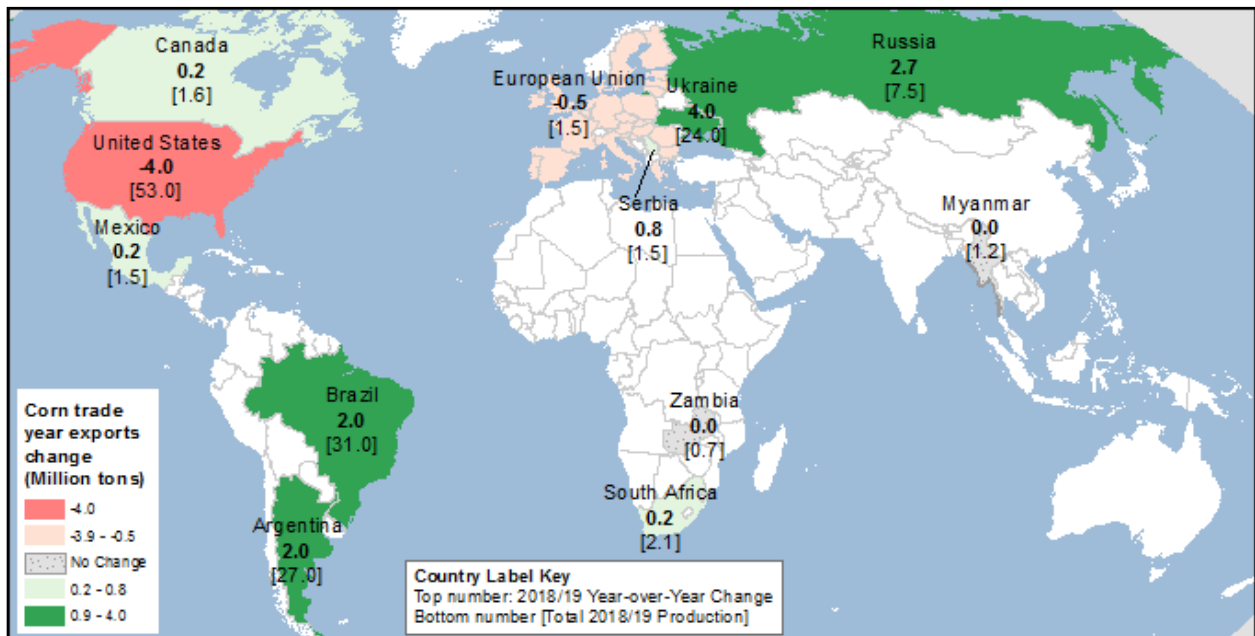
Note: Flow diagrams created by David Nulph (ERS, ISD) using SankeyMATIC

Source: Global Trade Atlas (GTA).

**U.S.** corn exports in 2018/19 (October-September) are projected to reach 53.0 million tons, down 4.0 million from the revised current 2017/18 (for the September-August local marketing year U.S. exports are projected at 2,100 million bushels, down from 2,225 million). On one hand, the competition from **Argentina, Ukraine, and Russia**, whose combined exports are to increase by more than 8 million tons in 2018/19, is expected to weigh down on U.S. exports. On the other hand, U.S. corn export prospects for 2018/19 are starting to get support from the poor current conditions in Brazil, as dryness in major producing areas cuts the country's 2017/18 second-crop corn yields. Marketing of the 2017/18 Brazilian crop is going to begin in July-August 2018 and continue through March 2019 and is expected to affect export markets going into the 2018/19 October-September trade year. As Brazilian corn exports for both 2017/18 and 2018/19 international trade years are being downgraded, the United States is beginning to display sharp improvement in exports.

Argentina, with a large crop in 2018/19, is projected to increase exports 2.0 million tons to a record 27.0 million, supported by high supplies, relatively free market for exports, and a depreciation of its currency (the peso). Outside of South America, Ukraine, Russia, and Canada are forecast to increase corn exports. High projected output, relatively low costs of production, and access to the lucrative EU market are a boost to Ukrainian corn exports. Ukraine is also expanding into Asian markets, with exports higher by 4.0 million tons to reach 24.0 million. Ample corn supplies in Russia support a 2.7-million-ton increase in exports to 7.5 million. Higher projected corn output in Canada is expected to support a rebound in corn exports, up 0.3 million tons to 1.6 million. The map below provides a quick look at the size and the year-over-year changes in corn exports for the major exporters.

**Map C: Major changes in corn exports for 2018/19**



Source: USDA, Foreign Agricultural Service, Production, Supply, and Distribution database.

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Table 1--Feed grains: U.S. quarterly supply and disappearance (million bushels), 5/14/2018

| Commodity, market year,<br>and quarter 1/ |         |         | Beginning<br>stocks | Production | Imports | Total<br>supply | Food,<br>seed, and<br>industrial<br>use | Feed and<br>residual<br>use | Exports | Total<br>disappear-<br>ance | Ending<br>stocks | Farm<br>price 2/<br>(dollars<br>per<br>bushel) |      |
|---|---------|---------|---------------------|------------|---------|-----------------|---|-----------------------------|---------|-----------------------------|------------------|--|------|
| Corn                                      | 2015/16 | Sep-Nov | 1,731               | 13,602     | 13      | 15,346          | 1,631                                   | 2,178                       | 301     | 4,111                       | 11,235           | 3.65   |      |
|   |         | Dec-Feb | 11,235              |            | 18      | 11,253          | 1,652                                   | 1,438                       | 341     | 3,431                       | 7,822            | 3.64   |      |
|   |         | Mar-May | 7,822               |            | 21      | 7,843           | 1,655                                   | 914                         | 563     | 3,132                       | 4,711            | 3.60   |      |
|   |         | Jun-Aug | 4,711               |            | 16      | 4,727           | 1,710                                   | 584                         | 696     | 2,990                       | 1,737            | 3.55   |      |
|   |         | Mkt yr  | 1,731               | 13,602     | 68      | 15,401          | 6,648                                   | 5,114                       | 1,901   | 13,664                      | 1,737            | 3.61   |      |
|   | 2016/17 | Sep-Nov | 1,737               | 15,148     | 14      | 16,899          | 1,689                                   | 2,277                       | 548     | 4,514                       | 12,386           | 3.26   |      |
|   |         | Dec-Feb | 12,386              |            | 12      | 12,398          | 1,712                                   | 1,527                       | 537     | 3,776                       | 8,622            | 3.39   |      |
|   |         | Mar-May | 8,622               |            | 17      | 8,639           | 1,740                                   | 981                         | 689     | 3,410                       | 5,229            | 3.46   |      |
|   |         | Jun-Aug | 5,229               |            | 14      | 5,243           | 1,743                                   | 688                         | 518     | 2,949                       | 2,293            | 3.40   |      |
|   |         | Mkt yr  | 1,737               | 15,148     | 57      | 16,942          | 6,883                                   | 5,472                       | 2,293   | 14,649                      | 2,293            | 3.36   |      |
|   | 2017/18 | Sep-Nov | 2,293               | 14,604     | 11      | 16,908          | 1,745                                   | 2,248                       | 349     | 4,342                       | 12,567           | 3.22   |      |
|   |         | Dec-Feb | 12,567              |            | 9       | 12,575          | 1,737                                   | 1,508                       | 441     | 3,687                       | 8,888            | 3.30   |      |
|   |         | Mkt yr  | 2,293               | 14,604     | 50      | 16,947          | 7,040                                   | 5,500                       | 2,225   | 14,765                      | 2,182            | 3.25-3.55                                      |      |
|   | 2018/19 | Mkt yr  | 2,182               | 14,040     | 50      | 16,272          | 7,115                                   | 5,375                       | 2,100   | 14,590                      | 1,682            | 3.30-4.30                                      |      |
|   | Sorghum | 2015/16 | Sep-Nov             | 18.41      | 596.75  | 3.60            | 618.76                                  | 22.14                       | 159.65  | 114.44                      | 296.23           | 322.54   | 3.54 |
|   |         |         | Dec-Feb             | 322.54     |         | 0.98            | 323.51                                  | 41.77                       | -6.14   | 86.30                       | 121.93           | 201.58   | 3.17 |
|   |         |         | Mar-May             | 201.58     |         | 0.01            | 201.59                                  | 43.31                       | -5.53   | 73.46                       | 111.24           | 90.35  | 3.10 |
|   |         |         | Jun-Aug             | 90.35      |         | 0.01            | 90.36                                   | 29.73                       | -41.39  | 65.38                       | 53.73            | 36.63  | 3.33 |
|   |         |         | Mkt yr              | 18.41      | 596.75  | 4.59            | 619.75                                  | 136.95                      | 106.58  | 339.58                      | 583.12           | 36.63  | 3.31 |
|   |         | 2016/17 | Sep-Nov             | 36.63      | 480.26  | 0.00            | 516.90                                  | 21.65                       | 142.68  | 44.43                       | 208.75           | 308.15   | 2.62 |
| Dec-Feb                                   |         |         | 308.15              |            | 0.00    | 308.15          | 33.06                                   | 3.56                        | 90.79   | 127.41                      | 180.75           | 2.69   |      |
| Mar-May                                   |         |         | 180.75              |            | 0.00    | 180.75          | 34.62                                   | 3.95                        | 57.48   | 96.04                       | 84.71            | 2.79   |      |
| Jun-Aug                                   |         |         | 84.71               |            | 1.73    | 86.44           | 25.30                                   | -20.19                      | 47.87   | 52.98                       | 33.46            | 3.53   |      |
| Mkt yr                                    |         |         | 36.63               | 480.26     | 1.74    | 518.63          | 114.61                                  | 129.99                      | 240.57  | 485.18                      | 33.46            | 2.79   |      |
| 2017/18                                   |         | Sep-Nov | 33.46               | 363.83     | 1.91    | 399.20          | 13.92                                   | 112.19                      | 45.60   | 171.71                      | 227.49           | 3.10   |      |
|   |         | Dec-Feb | 227.49              |            | 0.05    | 227.55          | 9.30                                    | 8.56                        | 71.42   | 89.27                       | 138.27           | 3.19   |      |
|   |         | Mkt yr  | 33.46               | 363.83     | 2.00    | 399.29          | 45.00                                   | 80.00                       | 245.00  | 370.00                      | 29.29            | 3.10-3.30                                      |      |
| 2018/19                                   |         | Mkt yr  | 29.29               | 343.00     |         | 372.29          | 100.00                                  | 80.00                       | 165.00  | 345.00                      | 27.29            | 3.10-4.10                                      |      |



Table 1--Feed grains: U.S. quarterly supply and disappearance, cont. (million bushels), 5/14/2018

| Commodity, market year,<br>and quarter 1/ |         | Beginning<br>stocks | Production | Imports | Total<br>supply | Food,<br>seed, and<br>industrial<br>use | Feed and<br>residual<br>use | Exports | Total<br>disappear-<br>ance | Ending<br>stocks | Farm<br>price 2/<br>(dollars<br>per<br>bushel) |           |      |
|---|---------|---------------------|------------|---------|-----------------|---|-----------------------------|---------|-----------------------------|------------------|--|-----------|------|
| Barley                                    | 2015/16 | Jun-Aug             | 79         | 218     | 4               | 301                                     | 41                          | 38      | 3                           | 82               | 219  | 5.39      |      |
|   |         | Sep-Nov             | 219        |         | 4               | 223                                     | 37                          | 1       | 4                           | 43               | 180  | 5.52      |      |
|   |         | Dec-Feb             | 180        |         | 7               | 187                                     | 36                          | 11      | 3                           | 50               | 138  | 5.66      |      |
|   |         | Mar-May             | 138        |         | 4               | 141                                     | 44                          | -5      | 1                           | 39               | 102  | 5.43      |      |
|   |         | Mkt yr              | 79         | 218     | 19              | 315                                     | 158                         | 44      | 11                          | 213              | 102  | 5.52      |      |
|   | 2016/17 | Jun-Aug             | 102        | 200     | 2               | 304                                     | 41                          | 32      | 1                           | 74               | 230  | 4.99      |      |
|   |         | Sep-Nov             | 230        |         | 2               | 232                                     | 39                          | -0      | 1                           | 40               | 193  | 4.78      |      |
|   |         | Dec-Feb             | 193        |         | 2               | 195                                     | 37                          | 12      | 1                           | 50               | 145  | 5.04      |      |
|   |         | Mar-May             | 145        |         | 3               | 148                                     | 45                          | -6      | 2                           | 41               | 106  | 4.96      |      |
|   |         | Mkt yr              | 102        | 200     | 10              | 312                                     | 162                         | 39      | 4                           | 205              | 106  | 4.96      |      |
|   | 2017/18 | Jun-Aug             | 106        | 142     | 2               | 251                                     | 42                          | 27      | 2                           | 71               | 180  | 4.52      |      |
|   |         | Sep-Nov             | 180        |         | 2               | 182                                     | 40                          | -19     | 2                           | 23               | 159  | 4.43      |      |
|   |         | Dec-Feb             | 159        |         | 2               | 161                                     | 39                          | -9      | 1                           | 31               | 129  | 4.47      |      |
|   |         | Mkt yr              | 106        | 142     | 10              | 258                                     | 162                         | 25      | 6                           | 193              | 65   | 4.50      |      |
|   | 2018/19 | Mkt yr              | 65         | 147     | 20              | 232                                     | 155                         | 25      | 5                           | 185              | 47   | 4.00-5.20 |      |
|   | Oats    | 2015/16             | Jun-Aug    | 54      | 90              | 18                                      | 161                         | 18      | 49                          | 0                | 68   | 94        | 2.15 |
|   |         |                     | Sep-Nov    | 94      |                 | 26                                      | 120                         | 18      | 19                          | 1                | 37   | 83        | 2.08 |
|   |         |                     | Dec-Feb    | 83      |                 | 25                                      | 108                         | 17      | 15                          | 0                | 33   | 75        | 2.09 |
|   |         |                     | Mar-May    | 75      |                 | 16                                      | 91                          | 23      | 10                          | 1                | 34   | 57        | 2.11 |
|   |         |                     | Mkt yr     | 54      | 90              | 86                                      | 229                         | 77      | 94                          | 2                | 172  | 57        | 2.12 |
| 2016/17                                   |         | Jun-Aug             | 57         | 65      | 21              | 142                                     | 19                          | 44      | 1                           | 64               | 79   | 1.87      |      |
|   |         | Sep-Nov             | 79         |         | 28              | 106                                     | 18                          | 12      | 1                           | 31               | 75   | 2.03      |      |
|   |         | Dec-Feb             | 75         |         | 24              | 100                                     | 17                          | 18      | 1                           | 36               | 63   | 2.35      |      |
|   |         | Mar-May             | 63         |         | 18              | 81                                      | 22                          | 8       | 1                           | 31               | 50   | 2.42      |      |
|   |         | Mkt yr              | 57         | 65      | 90              | 212                                     | 76                          | 82      | 3                           | 162              | 50   | 2.06      |      |
| 2017/18                                   |         | Jun-Aug             | 50         | 49      | 19              | 119                                     | 18                          | 28      | 1                           | 47               | 72   | 2.35      |      |
|   |         | Sep-Nov             | 72         |         | 30              | 102                                     | 19                          | 17      | 1                           | 36               | 66   | 2.58      |      |
|   |         | Dec-Feb             | 66         |         | 20              | 86                                      | 18                          | 13      | 1                           | 31               | 55   | 2.97      |      |
|   |         | Mkt yr              | 50         | 49      | 87              | 187                                     | 78                          | 85      | 3                           | 166              | 21   | 2.55      |      |
| 2018/19                                   |         | Mkt yr              | 21         | 66      | 95              | 182                                     | 79                          | 75      | 2                           | 156              | 26   | 2.55-3.15 |      |

Latest market year is projected; previous market year is estimated. Totals may not add due to rounding.

1/ Corn and sorghum, September 1-August 31 marketing year; Barley and oats, June 1-May 31 marketing year.

2/ Average price received by farmers based on monthly price weighted by monthly marketings. For the latest market year, quarterly prices are calculated by using the current monthly prices weighted by the monthly marketings for those months for the previous 5 years divided by the sum of marketings for those months.

Source: USDA, World Agricultural Outlook Board, World Agricultural Supply and Demand Estimates and supporting materials.

Data run: 5/11/2018

Table 2--Feed and residual use of wheat and coarse grains, 5/14/2018

| Market year and quarter 1/ |            | Corn<br>(million<br>metric tons) | Sorghum<br>(million<br>metric tons) | Barley<br>(million<br>metric tons) | Oats<br>(million<br>metric tons) | Feed grains<br>(million<br>metric tons) | Wheat<br>(million<br>metric tons) | Energy feeds<br>(million<br>metric tons) | Grain<br>consuming<br>animal units<br>(millions) | Energy feeds<br>per grain<br>consuming<br>animal unit<br>(tons) |
|----------------------------|------------|----------------------------------|-------------------------------------|------------------------------------|----------------------------------|---|-----------------------------------|--|--|---|
| 2016/17                    | Q1 Sep-Nov | 57.8                             | 3.6                                 | -0.0                               | 0.2                              | 61.7                                    | -0.8                              | 60.9                                     |  |   |
|                            | Q2 Dec-Feb | 38.8                             | 0.1                                 | 0.3                                | 0.3                              | 39.5                                    | -0.6                              | 38.9                                     |  |   |
|                            | Q3 Mar-May | 24.9                             | 0.1                                 | -0.1                               | 0.2                              | 25.1                                    | -1.6                              | 23.5                                     |  |   |
|                            | Q4 Jun-Aug | 17.5                             | -0.5                                | 0.6                                | 0.5                              | 18.0                                    | 4.6                               | 22.6                                     |  |   |
|                            | MY Sep-Aug | 139.0                            | 3.3                                 | 0.7                                | 1.2                              | 144.2                                   | 1.6                               | 145.9                                    | 95.6   | 1.5   |
| 2017/18                    | Q1 Sep-Nov | 57.1                             | 2.8                                 | -0.4                               | 0.3                              | 59.9                                    | -1.5                              | 58.3                                     |  |   |
|                            | Q2 Dec-Feb | 38.3                             | 0.2                                 | -0.2                               | 0.2                              | 38.6                                    | -0.5                              | 38.1                                     |  |   |
|                            | MY Sep-Aug | 139.7                            | 2.0                                 | 0.5                                | 1.6                              | 143.8                                   | 2.5                               | 146.3                                    | 98.5   | 1.5   |
| 2018/19                    | MY Sep-Aug | 136.5                            | 2.0                                 | 0.5                                | 1.3                              | 140.5                                   | 3.2                               | 143.6                                    | 100.0  | 1.4   |

1/ Corn and sorghum, September 1-August 31 marketing year; Barley and oats, June 1-May 31 marketing year.

Source: USDA, World Agricultural Outlook Board, World Agricultural Supply and Demand Estimates and supporting materials.

Table 3--Cash feed grain prices, 5/14/2018

| Mkt year and month 1/ | Corn, No. 2 yellow,<br>Central IL<br>(dollars per bushel)      |         |         | Corn, No. 2 yellow,<br>Gulf ports, LA<br>(dollars per bushel)     |         |         | Sorghum, No. 2<br>yellow,<br>Gulf ports, LA<br>(dollars per cwt)    |         |         |
|-----------------------|--|---------|---------|---|---------|---------|---|---------|---------|
|                       | 2015/16  | 2016/17 | 2017/18 | 2015/16   | 2016/17 | 2017/18 | 2015/16   | 2016/17 |         |
| Sep                   | 3.55   | 3.09    | 3.15    | 4.22  | 3.78    | 3.74    | 8.08  |         |         |
| Oct                   | 3.67   | 3.27    | 3.15    | 4.36  | 3.88    | 3.77    | 8.23  |         |         |
| Nov                   | 3.62   | 3.28    | 3.14    | 4.22  | 3.83    | 3.78    | 7.89  |         |         |
| Dec                   | 3.62   | 3.34    | 3.21    | 4.17  | 3.88    | 3.79    |   |         |         |
| Jan                   | 3.55   | 3.45    | 3.29    | 4.09  | 4.07    | 3.96    |   |         |         |
| Feb                   | 3.56   | 3.51    | 3.45    | 4.06  | 4.14    | 4.15    |   |         |         |
| Mar                   | 3.54   | 3.40    | 3.52    | 4.05  | 4.04    | 4.36    |   |         |         |
| Apr                   | 3.61   | 3.41    | 3.54    | 4.17  | 3.98    | 4.46    |   |         |         |
| May                   | 3.74   | 3.47    |         | 4.30  | 4.03    |         |   |         |         |
| Jun                   | 3.91   | 3.49    |         | 4.62  | 4.01    |         | 7.56  |         |         |
| Jul                   | 3.28   | 3.51    |         | 4.11  | 4.00    |         |   |         |         |
| Aug                   | 3.09   | 3.27    |         | 3.82  | 3.77    |         |   |         |         |
| Mkt year              | 3.56   | 3.37    |         | 4.18  | 3.95    |         | 8.07  | 7.56    |         |
|                       | Barley, No. 2 feed,<br>Minneapolis, MN<br>(dollars per bushel) |         |         | Barley, No. 3 malting,<br>Minneapolis, MN<br>(dollars per bushel) |         |         | Oats, No. 2 white heavy,<br>Minneapolis, MN<br>(dollars per bushel) |         |         |
|                       | 2015/16  | 2016/17 | 2017/18 | 2015/16   | 2016/17 | 2017/18 | 2015/16   | 2016/17 | 2017/18 |
| Jun                   | 2.59   | 2.36    | 2.05    |   |         | 4.70    | 2.89  | 2.58    | 2.95    |
| Jul                   | 2.70   | 2.33    | 2.05    |   |         | 4.67    | 2.82  | 2.61    | 3.17    |
| Aug                   | 2.41   | 2.08    | 2.10    |   |         | 4.70    | 2.63  | 2.34    | 2.98    |
| Sep                   | 2.39   | 1.95    | 2.10    | 4.95  |         | 4.70    | 2.70  | 2.29    | 2.87    |
| Oct                   | 2.57   | 2.00    | 2.10    | 4.95  |         | 4.70    | 2.58  | 2.67    | 2.97    |
| Nov                   | 2.60   | 2.00    | 2.36    |   |         |         | 2.67  | 2.84    | 2.94    |
| Dec                   | 2.60   | 2.00    | 2.61    |   |         | 4.85    | 2.64  | 2.92    | 2.73    |
| Jan                   | 2.58   | 2.00    | 2.65    |   |         | 4.85    | 2.60  | 2.97    | 2.90    |
| Feb                   | 2.50   | 2.00    | 2.81    |   |         | 4.85    | 2.60  | 3.07    | 2.96    |
| Mar                   | 2.46   | 2.02    | 2.85    |   | 4.70    | 4.50    | 2.43  | 2.90    | 2.79    |
| Apr                   | 2.45   | 2.05    | 2.85    |   |         |         | 2.49  | 2.86    | 2.72    |
| May                   | 2.44   | 2.05    |         |   |         |         | 2.49  | 2.88    |         |
| Mkt year              | 2.52   | 2.07    |         | 4.95  | 4.70    |         | 2.63  | 2.74    |         |

1/ Corn and sorghum, September 1-August 31 marketing year; Barley and oats, June 1-May 31 marketing year. Simple average of monthly prices for the marketing year.

Source: USDA, Agricultural Marketing Service, <http://marketnews.usda.gov/portal/lg>.

Data run: 5/11/2018

Table 4--Selected feed and feed byproduct prices (dollars per ton), 5/14/2018

| Mkt year and month | Soybean meal, high protein, Central Illinois, IL |         |         | Cottonseed meal, 41% solvent, Memphis, TN     |         |         | Corn gluten feed, 21% protein, Midwest |         |         | Corn gluten meal, 60% protein, Midwest      |         |         |
|--------------------|--|---------|---------|---|---------|---------|--|---------|---------|---|---------|---------|
|                    | 2015/16  | 2016/17 | 2017/18 | 2015/16                                       | 2016/17 | 2017/18 | 2015/16                                | 2016/17 | 2017/18 | 2015/16                                     | 2016/17 | 2017/18 |
| Oct                | 327.97   | 323.26  | 319.24  | 292.50  | 241.88  | 229.00  | 96.00                                  | 77.00   | 80.70   | 509.38                                      | 466.13  | 469.30  |
| Nov                | 308.60   | 322.42  | 313.52  | 291.88  | 221.00  | 228.75  | 109.63                                 | 83.50   | 93.00   | 477.50                                      | 477.50  | 487.24  |
| Dec                | 289.78   | 321.03  | 327.17  | 265.00  | 217.50  | 232.50  | 113.13                                 | 92.83   | 96.25   | 482.25                                      | 501.67  | 482.88  |
| Jan                | 279.57   | 332.34  | 322.60  | 248.75  | 223.50  | 259.00  | 109.63                                 | 97.50   | 98.80   | 452.50                                      | 502.50  | 477.60  |
| Feb                | 273.61   | 334.32  | 362.85  | 238.13  | 221.88  | 303.13  | 102.38                                 | 88.13   | 106.25  | 457.50                                      | 516.50  | 483.13  |
| Mar                | 276.23   | 320.34  | 379.85  | 216.50  | 210.63  | 323.13  | 87.00                                  | 87.13   | 105.50  | 445.50                                      | 505.63  | 524.75  |
| Apr                | 303.81   | 305.67  | 385.85  | 207.50  | 195.00  | 263.13  | 73.25                                  | 75.00   |         | 434.00                                      | 501.13  |         |
| May                | 376.36   | 293.68  |         | 242.50  | 179.50  |         | 87.00                                  | 71.00   |         | 464.10                                      | 485.30  |         |
| Jun                | 408.58   | 258.75  |         | 284.00  | 179.38  |         | 107.13                                 | 68.38   |         | 568.13                                      | 475.75  |         |
| Jul                | 371.49   | 326.04  |         | 280.00  | 200.84  |         | 95.01                                  | 71.35   |         | 573.13                                      | 467.88  |         |
| Aug                | 340.80   | 301.05  |         | 280.00  | 198.50  |         | 90.30                                  | 73.10   |         | 507.20                                      | 475.50  |         |
| Sep                | 337.95   | 307.70  |         | 285.00  | 213.75  |         | 85.38                                  | 75.00   |         | 469.38                                      | 469.25  |         |
| Mkt yr             | 324.56   | 312.22  |         | 260.98  | 208.61  |         | 96.32                                  | 79.99   |         | 486.71                                      | 487.06  |         |
| Mkt year and month | Meat and bone meal, Central US                   |         |         | Distillers dried grains, Central Illinois, IL |         |         | Wheat middlings, Kansas City, MO       |         |         | Alfalfa hay, weighted-average farm price 2/ |         |         |
|                    | 2015/16  | 2016/17 | 2017/18 | 2015/16                                       | 2016/17 | 2017/18 | 2015/16                                | 2016/17 | 2017/18 | 2016/17                                     | 2017/18 |         |
| Oct                | 291.88   | 237.50  | 228.00  | 123.13  | 116.25  | 117.30  | 105.93                                 | 79.43   | 70.36   | 135.00                                      | 152.00  |         |
| Nov                | 266.25   | 229.00  | 219.38  | 132.63  | 111.70  | 123.13  | 106.53                                 | 85.53   | 86.85   | 130.00                                      | 148.00  |         |
| Dec                | 221.67   | 211.67  | 221.67  | 133.13  | 104.84  | 143.75  | 99.55                                  | 101.62  | 107.88  | 127.00                                      | 148.00  |         |
| Jan                | 200.13   | 255.60  | 220.00  | 132.50  | 96.30   | 155.50  | 104.16                                 | 98.25   | 123.68  | 126.00                                      | 152.00  |         |
| Feb                | 193.75   | 285.00  | 225.84  | 136.63  | 98.88   | 158.88  | 97.89                                  | 84.66   | 114.61  | 127.00                                      | 155.00  |         |
| Mar                | 261.00   | 284.38  | 275.00  | 134.50  | 98.25   | 164.13  | 68.64                                  | 80.76   | 99.69   | 134.00                                      | 166.00  |         |
| Apr                | 316.25   | 266.25  | 316.25  | 122.38  | 99.25   | 174.38  | 65.12                                  | 58.03   | 100.22  | 150.00                                      |         |         |
| May                | 310.10   | 245.50  |         | 141.10  | 100.50  |         | 60.72                                  | 48.41   |         | 157.00                                      |         |         |
| Jun                | 345.00   | 248.13  |         | 170.50  | 105.25  |         | 57.94                                  | 60.39   |         | 154.00                                      |         |         |
| Jul                | 381.67   | 276.25  |         | 149.38  | 110.63  |         | 61.48                                  | 67.10   |         | 152.00                                      |         |         |
| Aug                | 347.00   | 318.50  |         | 130.90  | 110.00  |         | 60.61                                  | 63.15   |         | 147.00                                      |         |         |
| Sep                | 285.63   | 301.88  |         | 127.75  | 111.63  |         | 64.43                                  | 67.48   |         | 149.00                                      |         |         |
| Mkt yr             | 285.03   | 263.31  |         | 136.21  | 105.29  |         | 79.42                                  | 74.57   |         | 136.00                                      | 152.00  |         |

1/ October 1-September 30 except for hay. Simple average of monthly prices for the marketing year except for hay.

2/ May 1-April 30 marketing year. U.S. season-average price based on monthly price received by farmers weighted by monthly marketings.

Source: USDA, Agricultural Marketing Service, <http://marketnews.usda.gov/portal/lg>, and USDA, National Agricultural Statistics Service, [http://www.nass.usda.gov/Data\\_and\\_Statistics/Quick\\_Stats/index.asp](http://www.nass.usda.gov/Data_and_Statistics/Quick_Stats/index.asp).

Table 5--Corn: Food, seed, and industrial use (million bushels), 5/14/2018

| Mkt year and qtr 1/ | High-fructose corn syrup (HFCS) | Glucose and dextrose | Starch | Alcohol for fuel | Alcohol for beverages and manufacturing | Cereals and other products | Seed   | Total food, seed, and industrial use |          |
|---------------------|---------------------------------|----------------------|--------|------------------|---|----------------------------|--------|--------------------------------------|----------|
|                     |                                 |                      |        |                  |   |                            |        |                                      |          |
| 2016/17             | Q1 Sep-Nov                      | 113.14               | 88.81  | 58.20            | 1,343.08                                | 35.78                      | 49.92  | 0.00                                 | 1,688.93 |
|                     | Q2 Dec-Feb                      | 106.75               | 88.53  | 56.36            | 1,371.21                                | 36.35                      | 52.33  | 0.00                                 | 1,711.53 |
|                     | Q3 Mar-May                      | 119.64               | 96.14  | 59.72            | 1,346.10                                | 36.72                      | 54.45  | 27.25                                | 1,740.02 |
|                     | Q4 Jun-Aug                      | 126.35               | 97.09  | 61.18            | 1,371.56                                | 37.15                      | 47.60  | 2.05                                 | 1,742.99 |
|                     | MY Sep-Aug                      | 465.88               | 370.56 | 235.46           | 5,431.95                                | 146.00                     | 204.30 | 29.30                                | 6,883.46 |
| 2017/18             | Q1 Sep-Nov                      | 112.55               | 93.62  | 59.71            | 1,391.29                                | 36.30                      | 51.50  | 0.00                                 | 1,744.97 |
|                     | Q2 Dec-Feb                      | 105.21               | 87.91  | 56.87            | 1,397.46                                | 38.10                      | 51.60  | 0.00                                 | 1,737.15 |
|                     | MY Sep-Aug                      | 460.00               | 380.00 | 240.00           | 5,575.00                                | 149.00                     | 207.10 | 28.90                                | 7,040.00 |
| 2018/19             | MY Sep-Aug                      | 460.00               | 400.00 | 240.00           | 5,625.00                                | 150.00                     | 210.10 | 29.90                                | 7,115.00 |

1/ September-August. Latest data may be preliminary or projected.

Source: Calculated by USDA, Economic Research Service.

Date run: 5/11/2018

Table 6--Wholesale corn milling product and byproduct prices, 5/14/2018

| Mkt year and<br>month 1/ | Corn meal, yellow,<br>Chicago, IL<br>(dollars per cwt) |         | Corn meal, yellow,<br>New York, NY<br>(dollars per cwt) |         | Corn starch,<br>Midwest 3/<br>(dollars per cwt) |         | Dextrose,<br>Midwest<br>(cents per pound) |         | High-fructose corn<br>syrup (42%),<br>Midwest<br>(cents per pound) |         |
|--------------------------|--|---------|---|---------|---|---------|---|---------|--|---------|
|                          | 2016/17  | 2017/18 | 2016/17   | 2017/18 | 2016/17   | 2017/18 | 2016/17                                   | 2017/18 | 2016/17  | 2017/18 |
|                          | Sep  | 16.71   | 16.01   | 18.38   | 17.68   | 13.21   | 14.41                                     | 39.00   | 39.00  | 26.75   |
| Oct                      | 17.06  | 15.94   | 18.73   | 17.61   | 13.39   | 13.87   | 39.00                                     | 39.00   | 26.75  | 28.25   |
| Nov                      | 16.89  | 15.78   | 18.56   | 17.45   | 13.87   | 13.90   | 39.00                                     | 39.00   | 26.75  | 28.25   |
| Dec                      | 16.84  | 15.69   | 18.51   | 17.35   | 14.23   | 13.75   | 39.00                                     | 39.00   | 26.75  | 28.25   |
| Jan                      | 17.07  | 15.75   | 18.74   | 17.42   | 14.05   | 13.81   | 39.00                                     | 39.25   | 28.25  | 28.25   |
| Feb                      | 17.13  | 16.09   | 18.80   | 17.76   | 14.20   | 14.08   | 39.00                                     | 39.25   | 28.25  |         |
| Mar                      | 17.06  | 16.13   | 18.40   | 17.80   | 14.41   | 14.53   | 39.00                                     | 39.25   | 28.25  |         |
| Apr                      | 16.99  | 16.23   | 18.58   | 17.90   | 14.29   | 14.65   | 39.00                                     | 39.25   | 28.25  |         |
| May                      | 16.91  |         | 18.58   |         | 14.38   |         | 39.00                                     |         | 28.25  |         |
| Jun                      | 16.89  |         | 18.56   |         | 14.74   |         | 39.00                                     |         | 28.25  |         |
| Jul                      | 16.89  |         | 18.56   |         | 15.04   |         | 39.00                                     |         | 28.25  |         |
| Aug                      | 16.25  |         | 17.92   |         | 14.98   |         | 39.00                                     |         | 28.25  |         |
| Mkt year 2/              | 16.89  |         | 18.53   |         | 14.23   |         | 39.00                                     |         | 27.75  |         |

1/ September-August. Latest month is preliminary.

2/ Simple average of monthly prices for the marketing year.

3/ Bulk-industrial, unmodified.

Source: Milling and Baking News, except for corn starch which is from private industry.

Date run: 5/11/2018

Table 7--U.S. feed grain imports by selected sources (1,000 metric tons) 1/, 5/14/2018

| Import and country/region | ----- 2015/16 ----- |         | ----- 2016/17 ----- |         | 2017/18 |       |
|---------------------------|---------------------|---------|---------------------|---------|---------|-------|
|                           | Mkt year            | Jun-Mar | Mkt year            | Jun-Mar | Jun-Mar |       |
| Oats                      | Canada              | 1,378   | 1,225               | 1,508   | 1,353   | 1,262 |
|                           | Sweden              | 62      | 62                  | 27      | 5       | 41    |
|                           | Finland             | 34      | 27                  | 21      | 21      | 16    |
|                           | All other countries | 0       | 0                   | 0       | 0       | 0     |
|                           | Total 2/            | 1,475   | 1,315               | 1,556   | 1,380   | 1,319 |
| Malting barley            | Canada              | 285     | 265                 | 103     | 85      | 70    |
|                           | All other countries | 0       | 0                   | 17      | 17      | 1     |
|                           | Total 2/            | 285     | 265                 | 119     | 102     | 70    |
| Other barley 3/           | Canada              | 116     | 101                 | 89      | 72      | 92    |
|                           | All other countries | 4       | 3                   | 2       | 1       | 0     |
|                           | Total 2/            | 119     | 104                 | 90      | 73      | 92    |

1/ Grain only. Market year (June-May) and market year to date.

2/ Totals may not add due to rounding.

3/ Grain for purposes other than malting, such as feed and seed use.

Source: U.S. Department of Commerce, Bureau of the Census, Foreign Trade Statistics.

Date run: 5/11/2018

Table 8--U.S. feed grain exports by selected destinations (1,000 metric tons) 1/, 5/14/2018

| Export and country/region | ----- 2015/16 ----- |         | ----- 2016/17 ----- |         | 2017/18 |
|---------------------------|---------------------|---------|---------------------|---------|---------|
|                           | Mkt year            | Sep-Mar | Mkt year            | Sep-Mar | Sep-Mar |
| Corn                      |                     |         |                     |         |         |
| Mexico                    | 13,337              | 7,087   | 13,916              | 7,399   | 7,895   |
| Japan                     | 10,439              | 4,260   | 13,527              | 7,246   | 5,830   |
| Colombia                  | 4,548               | 2,856   | 4,730               | 3,605   | 2,917   |
| South Korea               | 2,964               | 803     | 5,601               | 3,710   | 1,892   |
| Peru                      | 2,383               | 1,203   | 2,986               | 1,705   | 1,835   |
| China (Taiwan)            | 2,038               | 424     | 2,966               | 1,887   | 623     |
| Saudi Arabia              | 1,389               | 489     | 2,138               | 1,459   | 655     |
| Venezuela                 | 1,155               | 331     | 419                 | 188     | 285     |
| Canada                    | 1,014               | 594     | 704                 | 455     | 822     |
| Guatemala                 | 906                 | 468     | 993                 | 553     | 369     |
| Egypt                     | 852                 | 189     | 323                 | 211     | 153     |
| Algeria                   | 663                 |         | 91                  | 91      | 48      |
| El Salvador               | 631                 | 348     | 593                 | 333     | 174     |
| Costa Rica                | 552                 | 203     | 819                 | 431     | 435     |
| Honduras                  | 550                 | 256     | 505                 | 274     | 291     |
| Morocco                   | 450                 | 32      | 871                 | 655     | 216     |
| European Union-27         | 413                 | 7       | 843                 | 203     | 599     |
| Vietnam                   | 413                 | 70      | 200                 | 199     | 321     |
| Panama                    | 392                 | 197     | 504                 | 327     | 288     |
| Israel                    | 388                 | 0.029   | 83                  | 0.054   | 59      |
| Chile                     | 353                 | 0.586   | 543                 | 543     | 0.574   |
| China (Mainland)          | 321                 | 197     | 807                 | 32      | 40      |
| Jamaica                   | 283                 | 158     | 275                 | 140     | 166     |
| Nicaragua                 | 258                 | 109     | 329                 | 171     | 119     |
| Dominican Republic        | 253                 | 12      | 807                 | 497     | 127     |
| All other countries       | 1,342               | 490     | 2,670               | 2,034   | 431     |
| Total 2/                  | 48,288              | 20,784  | 58,242              | 34,350  | 26,589  |
| Sorghum                   |                     |         |                     |         |         |
| China (Mainland)          | 7,034               | 4,965   | 4,801               | 3,184   | 3,725   |
| Mexico                    | 625                 | 337     | 585                 | 343     | 57      |
| Sub-Saharan Africa        | 593                 | 416     | 475                 | 364     | 93      |
| Pakistan                  | 205                 | 151     | 0.466               | 0.441   |         |
| All other countries       | 170                 | 102     | 250                 | 106     | 85      |
| Total 2/                  | 8,626               | 5,971   | 6,111               | 3,997   | 3,960   |
| Barley                    |                     |         |                     |         |         |
|                           | ----- 2015/16 ----- |         | ----- 2016/17 ----- |         | 2017/18 |
|                           | Mkt year            | Jun-Mar | Mkt year            | Jun-Mar | Jun-Mar |
| Mexico                    | 142                 | 141     | 2                   | 2       | 0.542   |
| Canada                    | 52                  | 48      | 63                  | 48      | 63      |
| Morocco                   | 14                  | 14      |                     |         |         |
| China (Taiwan)            | 7                   | 6       | 4                   | 4       | 3       |
| All other countries       | 21                  | 18      | 26                  | 18      | 34      |
| Total 2/                  | 235                 | 227     | 95                  | 71      | 101     |

1/ Grain only. Market year (September-August for corn and sorghum, June-May for barley) and market year to date.

2/ Totals may not add due to rounding.

Source: U.S. Department of Commerce, Bureau of the Census, Foreign Trade Statistics.

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