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Feed Outlook: December 2022

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In this report:

U.S. Feed Exports Are Revised Down, Domestic Use Is Forecast Up From November

This month, there are no changes to the feed grain production estimate for 2022. Corn and sorghum supplies are steady this month but are down from 2021/22 (at 15,357 million bushels and 289 million bushels, respectively), following a dry growing season—while barley and oat supplies are up from last year, on a return to trendline production following last year's drought.

Corn and sorghum exports for 2022/23 are revised down in the December *World Agricultural Supply and Demand Estimates (WASDE)* report, on limited supplies and a slow pace of sales early in the marketing year. Corn exports (of 2,075 million bushels) are projected down 75 million bushels from last month and sorghum exports (of 155 million bushels) are forecast down 20 million bushels from November. Sorghum consumed for food, seed, and industrial use (FSI) increased in December on strong ethanol production. Corn ending stocks are up 75 million bushels from November at 1,257 million—while sorghum, barley, and oats ending stocks are unchanged from last month.

World 2022/23 coarse grain production is projected lower this month. U.S. corn and sorghum exports are projected lower, with the very slow pace of shipments in October-November supporting a reduced forecast. The most significant developments outside the United States are a downward revision for Ukrainian corn production and a boost of its projected corn exports. EU corn imports are projected higher, as the European Union is expected to benefit from higher Ukrainian corn exports.

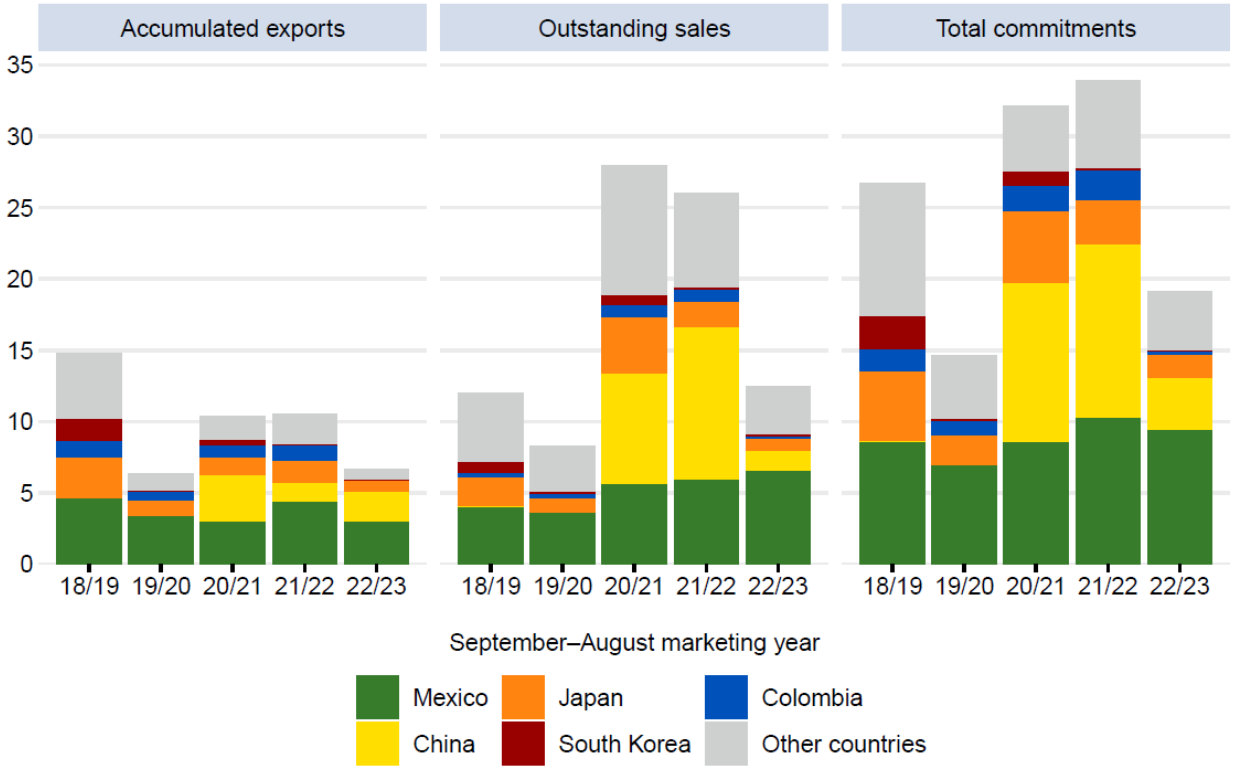
Domestic Outlook

Claire Hutchins

Reduced Corn Export Potential in 2022/23 Weighs on Price

The USDA, Foreign Agricultural Service (FAS) reported total U.S. corn export commitments (shipments plus outstanding sales of December 1, 2022) at 19.0 million metric tons (down 48 percent from last year and 32 percent below the 5-year average). Sales are slow (relative to last year) due to high export prices, driven by limited exportable supplies and difficult inland logics, resulting from historically low water levels on the Mississippi River—a critical channel that moves corn from the Midwest to export terminals in the Louisiana Gulf.

Figure 1
U.S. corn accumulated exports, outstanding sales, and total commitments, September 1 to December 1, 2018–2022
Million metric tons



Source: USDA, Foreign Agricultural Service.

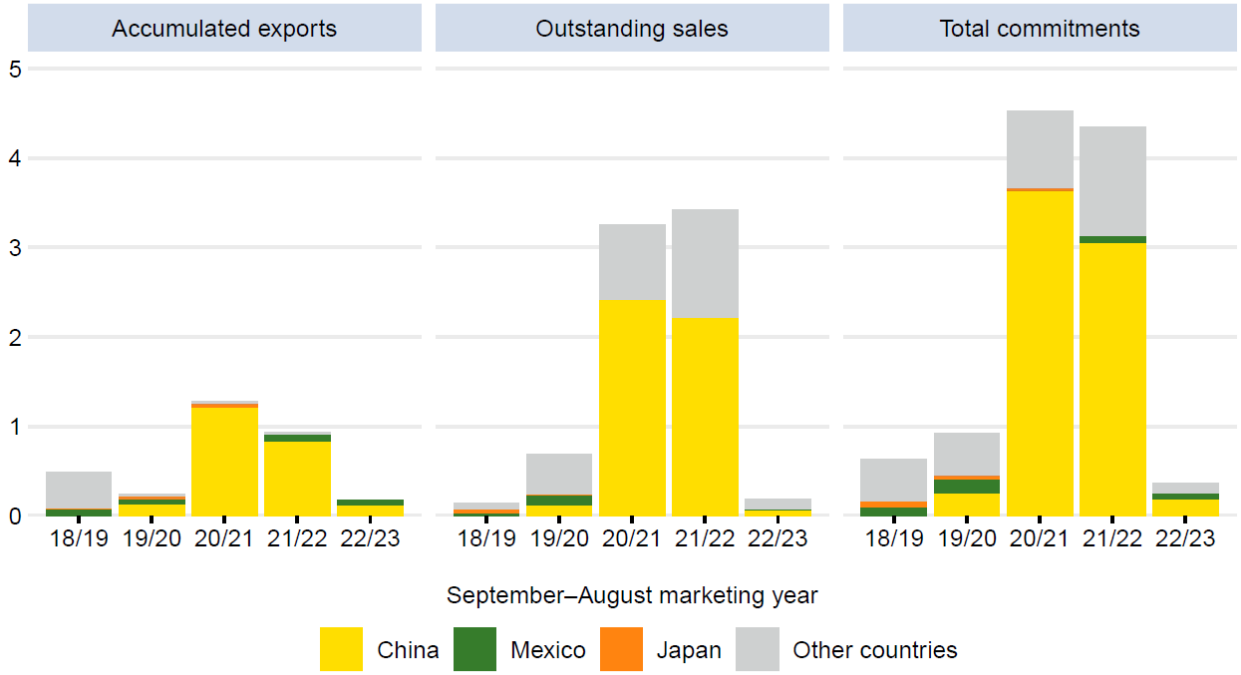
The 2022/23 corn ending stocks forecast increased in December on reduced exports, while domestic use remained unchanged at 12,025 million bushels. The forecasted corn season-

average farm price for 2022/23—of $6.70 per bushel—fell $0.10 from November on a lower-than-expected October national corn price received (of $6.50 per bushel) reported by USDA, National Agricultural Statistical Service (NASS).

Sorghum Exports Decline on the Month, but Ethanol Demand Strengthens

Projected sorghum supplies for 2022/23 are unchanged from last month but represent the lowest volume available since 2012/13 on widespread drought across the High and Southern Plains in summer 2022. Limited exportable supplies, combined with virtually no commercial activity to China thus far in the marketing year, led to an 11-percent reduction in the total 2022/23 sorghum export forecast in December.

Figure 2
U.S. sorghum accumulated exports, outstanding sales, and total commitments, September 1 to December 1, 2018–2022
Million metric tons

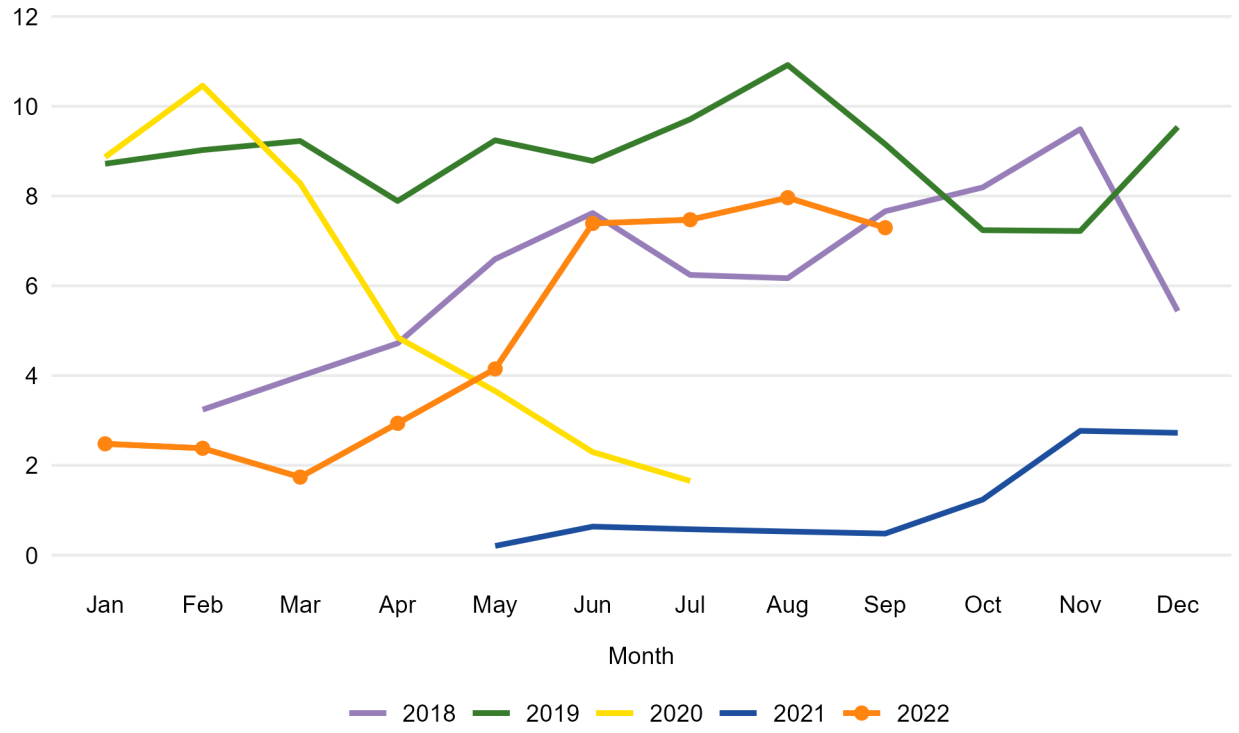


Source: USDA, Foreign Agricultural Service.

Fewer exports thus far in the marketing year mean more sorghum is available for domestic use in 2022/23. In December, the sorghum FSI forecast increased by 15 million bushels, on continued strength in the crush pace reported by the U.S. Department of Energy, Energy Information Administration. The sorghum feed and residual use category increased by 5 million

bushels from November, while ending stocks for 2022/23 are unchanged from last month. The projected sorghum season-average farm price is raised $.05 this month to $6.70 per bushel in 2022/23, in response to the latest NASS data showing higher prices received in October than in September.

Figure 3
U.S. sorghum consumed for fuel alcohol production, 2018–2022
Million bushels



Note: Data was withheld between August 2020 and April 2021 to avoid disclosing information for individual operators.
Source: USDA, Economic Research Service calculations using data from USDA, National Agricultural Statistics Service and the U.S. Department of Energy, Energy Information Administration.

Barley Supply and Demand Is Unchanged

Total supply is 231 million bushels, with 15 million bushels of barley imports. There are no changes to barley use, with total domestic use anticipated at 166 million bushels. The ending stocks projection sits at 65.5 million bushels, up 23.5 million bushels from last marketing year. The season-average price remains at $7.30 per bushel.

Oats Prices Are Lower, With Higher Imports

The oats supply for 2022/23 is up 5 million bushels, to 178 million bushels, on higher imports. U.S. Oat imports in December are forecast at 90 million bushels (a 5-million-bushel increase from November), reflecting larger exports from Canada, where crop prospects are higher this month. Feed and residual use is increased by 5 million bushels to 65 million bushels, on higher supply. Ending stocks in 2022/23 remain unchanged in December at 30.5 million bushels. The season-average oats price is reduced by $0.30 to $5.20, on lower price received thus far in the marketing year.

Grain Consuming Animal Units Are Lower in 2022/23

Grain Consuming Animal Units (GCAUs) are projected to be 99.22 million units in 2022/23, down from 100.04 in 2021/22. Total feed and residual use for feed grains and wheat in the United States for 2022/23 (September through August) is projected to be 141.96 million metric tons. This total sits lower than the 2021/22 estimate of 147.09 million metric tons. Higher sorghum and oat feed and residual use account for the change. Sorghum feed and residual is raised due to reduced sorghum exports, and oat feed is up on stronger import demand.

International Outlook

Angelica Williams

Reduced Prospects for Global Coarse Grain Production Are Driven by Lowered Corn Production

This month, world coarse grain production for **2022/23** is projected down 5.9 million tons from the November *WASDE* report. The largest reductions come from lower projected corn output from ***Ukraine***, ***Russia***, the ***European Union,*** and ***Vietnam.*** Barley output is projected slightly higher, as increased production in ***Australia*** and the ***European Union*** is being partially offset by lower barley output in ***Argentina*** and ***Uruguay***.

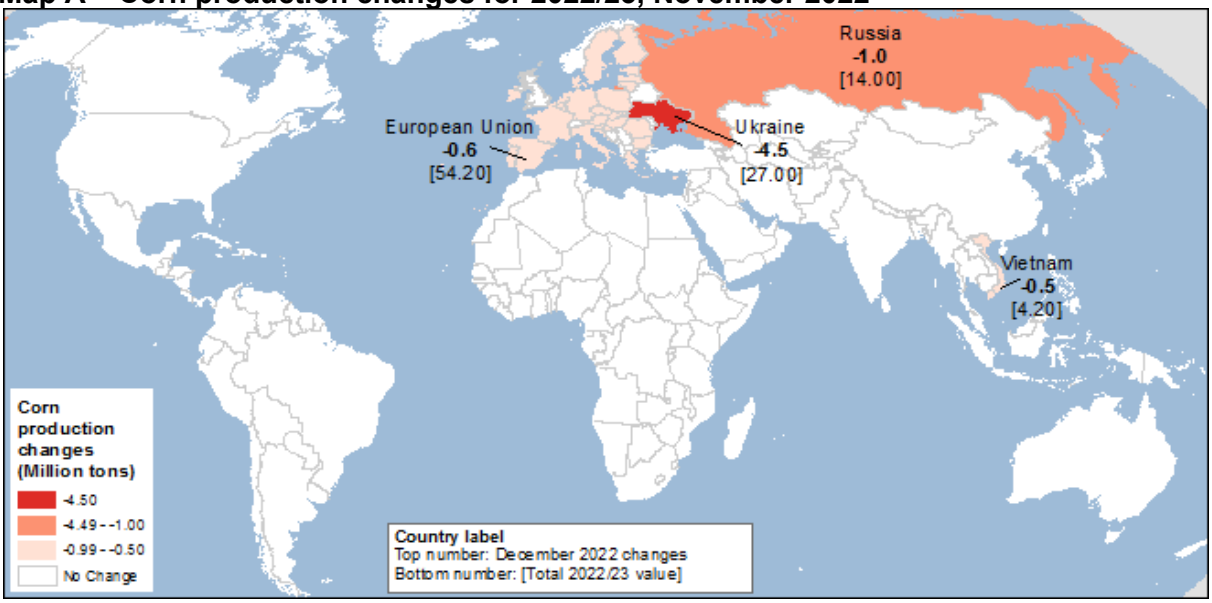
Ukraine's corn production is projected down 4.5 million tons, driven by both lower projected harvested area and yield. The corn harvest is significantly delayed, with 60 percent harvested as of December 2nd, while the historical average is about 90 percent completed by this time in the year. Harvest in some of the major-producing corn areas in Ukraine have been delayed due to the wettest autumn on record. Exacerbating the effect of unfavorable weather, the war with Russia pushed Ukrainian transportation and fuel costs up, increased the amount of lost or damaged machinery, and limited access to traditional storage and trade routes. At this point, unharvested corn is expected to be left in the fields until winter/spring. Corn prospects for ***Russia*** are also reduced this month due to similar weather conditions observed in Ukraine that have delayed harvest and left to projected higher-than-average abandonment. The revised corn area in ***Russia*** is down, with corn output projected 1.0 million tons lower to 14 million.

Australia and the ***European Union*** are projected to increase their barley production by 0.7 and 0.2 million tons, respectively, while barley production in ***Argentina*** and ***Uruguay*** is reduced by 0.3 and 0.1 million tons for 2022/23. Dry growing conditions in both South American countries have impacted yields, reducing barley production prospects this month.

Statistics Canada published survey-based final results for 2022/23 crops—with fractional adjustments for ***Canadian*** corn, barley, rye and mixed grain. The final reported 2022/23 oats yield is record high, supporting an output of 5.2 million tons.

For a detailed glance of this month's changes in coarse grain production, see map A and tables A1 and A2 below.

Map A – Corn production changes for 2022/23, November 2022



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

Table A1 - World and U.S. coarse grain production at a glance (2022/23), December 2022

	Region or country	Production	Change from previous month[1]	YoY Change[2]	Comments
		Million tons			
Coarse grain production (total)					
↓	**World**	**1,453.6**	**-5.9**	**-49.1**	
↓	**Foreign**	**1,088.9**	**-5.9**	**-16.1**	Partly offsetting changes are made for a number of countries and commodities.
	United States	**364.8**	**No change**	**-32.9**	See section on U.S. domestic output.
World production of coarse grains by type of grain					
CORN					
↓	**World**	**1,161.9**	**-6.5**	**-55.0**	
↓	**Foreign**	**808.0**	**-6.5**	**-25.9**	Reductions are projected for Ukraine, Russia, Vietnam, and the European Union. See table A2.
	United States	**353.8**	**No change**	**-29.1**	See section on U.S. domestic output.
BARLEY					
↑	**World**	**149.5**	**+0.5**	**+4.1**	
↑	**Foreign**	**145.7**	**+0.5**	**+2.9**	Higher output is projected for Australia and Canada—which more than offsets lower production in Argentina, the European Union and Ururguay. See table A2.
	United States	**3.8**	**No change**	**+1.2**	See section on U.S. domestic output.
OATS					
↑	**World**	**24.9**	**+0.4**	**+2.4**	
↑	**Foreign**	**24.1**	**+0.4**	**+2.1**	Higher projection for oats output in Canada. See table A2.
	United States	**0.8**	**No change**	**+0.3**	See section on U.S. domestic output.
SORGHUM					
↓	**World**	**60.1**	**-0.1**	**-2.1**	
↓	**Foreign**	**54.1**	**-0.1**	**+3.2**	Slightly lower projection for the European Union.
	United States	**6.0**	**No change**	**-5.4**	See section on U.S. domestic output.

[1]Change from previous month. [2] YoY: year-over-year changes. [3] Totals may not add due to rounding.

For changes and notes by country, see table A2.

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

Table A2 - Coarse grain foreign production by country at a glance, December 2022						
	Type of crop	Crop year	Production	Change in forecast[1]	YoY[2] change	Comments
			Million tons			
Coarse grain production by country and by type of grain (2022/23)						
			UKRAINE			
↓	**Corn**	*Oct-Sep*	**27.0**	**-4.5**	**-15.1**	Both corn area and yield are projected lower due to weather (incessant rains during the harvest) and war-induced conditions.
			RUSSIA			
↓	**Corn**	*Oct-Sep*	**14.0**	**-1.0**	**-1.2**	Incessant rains (the same as in Ukraine) delayed harvest and are expected to reduce harvested area.
			EUROPEAN UNIION (EU)			
↓	**Corn**	*Oct-Sep*	**54.2**	**-0.6**	**-16.8**	Lower corn yields are reported for France, Croatia, Slovakia, Italy, Austria, and a number of other EU countries. Area is projected higher in Poland, with an increase in corn production that partially offsets the reductions.
↑	**Barley**	*Jul-Jun*	**51.5**	**+0.2**	**-0.5**	Higher yileds and production for Denmark and several other counries outweigh reduced barley output in Spain and Poland.
↓	**Oats**	*Jul-Jun*	**7.6**	**-0.2**	**+0.1**	Production is projected lower in Sweden and severel other countries.
↓	**Mixed Grain**	*Jul-Jun*	**14.1**	**-0.4**	**-0.9**	Production is lowered mainly due to a reduced area in Poland. Production for sorghum is also projected slightly lower.
			ARGENTINA			
↓	**Barley**	*Dec-Nov*	**4.2**	**-0.3**	**-1.1**	Dry conditions in Southern Buenos Aires, the major barley-producing region, are expected to reduce both area harvested and yield.
			AUSTRALIA			
↑	**Barley**	*Nov-Oct*	**13.4**	**+0.7**	**-0.5**	Record high barley yields are projected, due to above-normal precipitation and excellent soil moisture. The increase is in line with the latest release of ABARES (Autralian Bureau of Agricultural and Resource Economics and Sciences) forecast.
			CANADA			
↑	**Oats**	*Aug-Jul*	**5.2**	**+0.6**	**+2.4**	Based on the final estimates by Statistics Canada—area, yield, and production for all Canadian crops are adjusted this month. Record-high yields pushed oats production to the highest level since 1991. For other coarse grains, the changes are minor and are less than 0.1 million tons.
			URUGUAY			
↓	**Barley**	*Dec-Nov*	**0.7**	**-0.1**	**-0.2**	Barley yields are projected lower following below average weather conditions during the key months of the crop reproductive period.
			VIETNAM			
↓	**Corn**	*May-Apr*	**4.2**	**-0.5**	**-0.2**	Corn area is reduced, as the farmers reportedly shift area to more profitable higher value crops (cassava).

[1]Change from previous month. Smaller changes are made for several countries, see map A for changes in ***corn***.

[2] YoY: year-over-year changes.

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

Global Coarse Grain Trade Is Down, the United States Sees the Largest Reduction

Projected 2022/23 world coarse grain exports for the international trade year (October—September) are revised down 1.9 million tons to 223.7 million this month. The decline is driven by lower projected corn and sorghum exports from the ***United States*** and partially offset by higher projected grain exports from a number of countries.

Global **corn** trade is projected down this month to 182.3 million tons for 2022/23, 1.2 million tons lower than the previous month. This month's projected reductions are for ***United States***, followed by ***Russia*** and the ***European Union***.

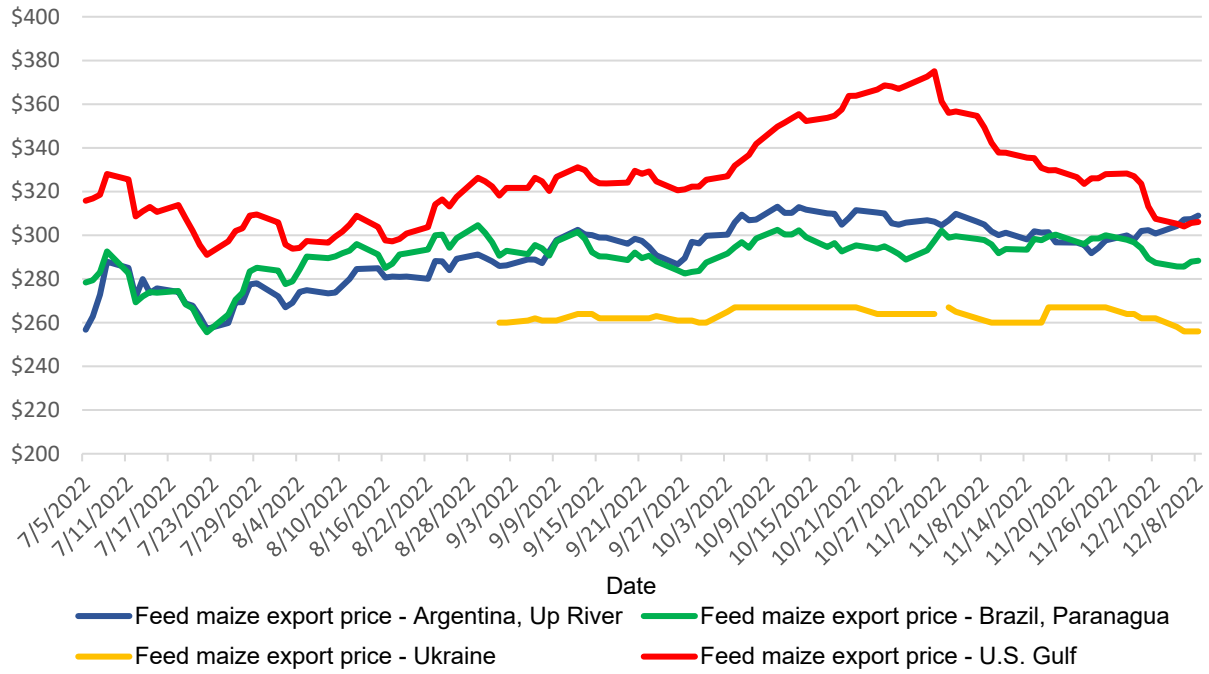
Projected 2022/23 trade-year U.S. corn exports are reduced 2.0 million tons to 55 million. Lack of price-competitiveness [demonstrated by the reported prices at the ports of origin for corn exports, combined with a strong U.S. dollar (see figure 4 below)] has left the United States as the highest-priced corn supplier, resulting in the slower pace of sales and smaller-than-expected recent months' shipments. Census corn shipments for October reached only 2.1 million tons, down almost 50 percent from a year earlier and the lowest since 2012/13 when exports were constrained by tight supplies caused by severe drought. Export inspections for November were 1.9 million tons, down also almost 50 percent from a year ago. Lower corn exports from the ***United States*** have led to projected reductions in corn imports for 3 of the main destinations for U.S. corn exports: ***Mexico***, ***Canada,*** and ***South Korea,*** down 0.5 million tons each.

With lower supplies, ***Russian*** corn exports are projected down 0.7 million tons and the decrease is expected to limit corn imports for ***Iran*** and ***Turkey***, the two major destinations for Russian corn exports. Corn imports are projected lower in both ***Iran*** and ***Turkey***, down 0.5 and 0.2 million tons, respectively.

Figure 4

Corn export prices by port of origin, July–December 2022, FOB

U.S. dolars per ton



Note: FOB = Free on Board.
Source: International Grains Council.

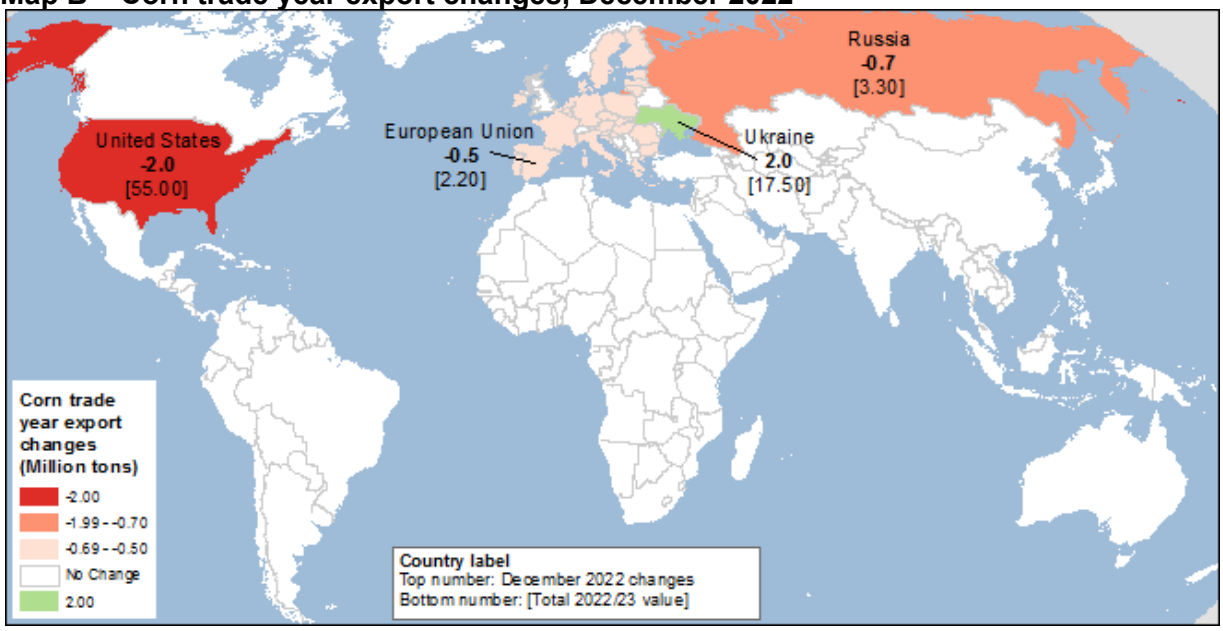
Despite lower projected corn output in ***Ukraine,*** its sales (especially to the ***European Union***) are getting stronger. The Ukrainian corn exports projection is getting a boost this month, up 2.0 million tons, to reach 17.5 million tons. It is expected that this corn will be mostly exported to the European Union, where corn imports are projected higher, up 1.5 million tons this month.

Global **barley** trade for the international trade year is forecast to decline fractionally to 29.5 million tons. ***Argentine*** and ***Uruguayan*** barley exports are reduced by 0.3 and 0.1 million tons, respectively, while higher exports are projected from ***Australia*** (partially to fill the global demand and offset the reduction by 0.3 million tons).

Sorghum global trade is projected down 0.7 million tons this month to 8.8 million. A slow pace of sorghum exports from the ***United States*** suggests a reduction in the U.S. export projection, down 0.5 million tons. Reduced sorghum supplies in ***Argentina*** are expected to limit its sorghum exports by 0.2 million tons. On the imports side of sorghum trade, ***China*** (the largest global sorghum importer) is expected to reduce its sorghum imports by 0.7 million tons in 2022/23.

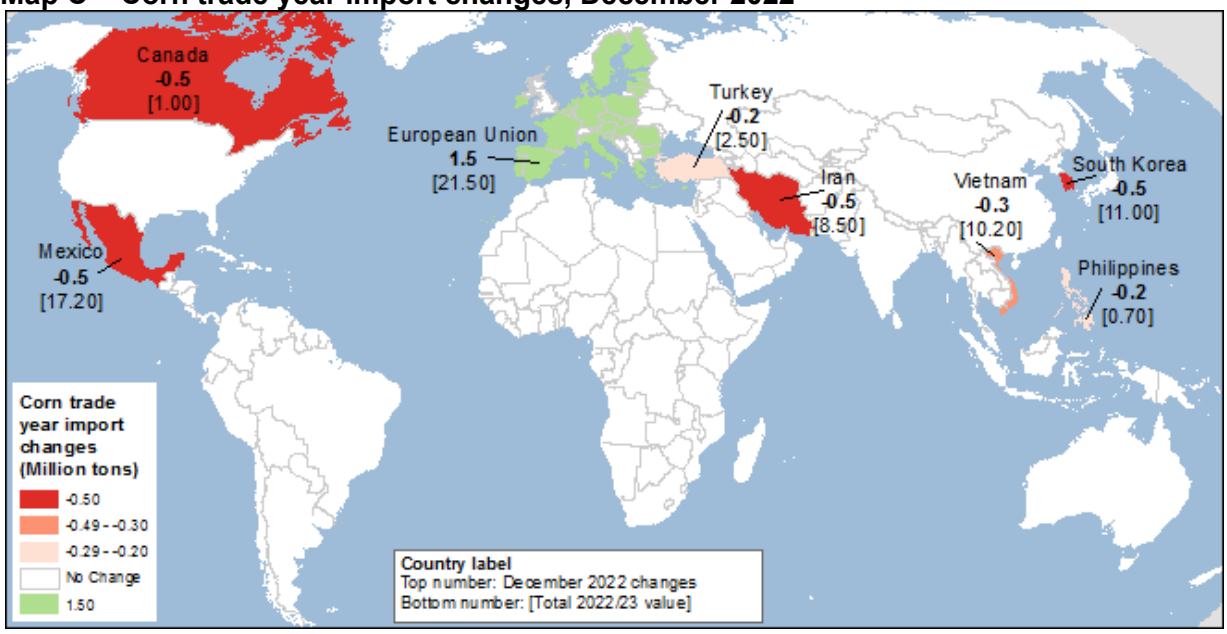
For more information on this month's changes in corn trade, see maps B and C below.

Map B – Corn trade year export changes, December 2022



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

Map C – Corn trade year import changes, December 2022

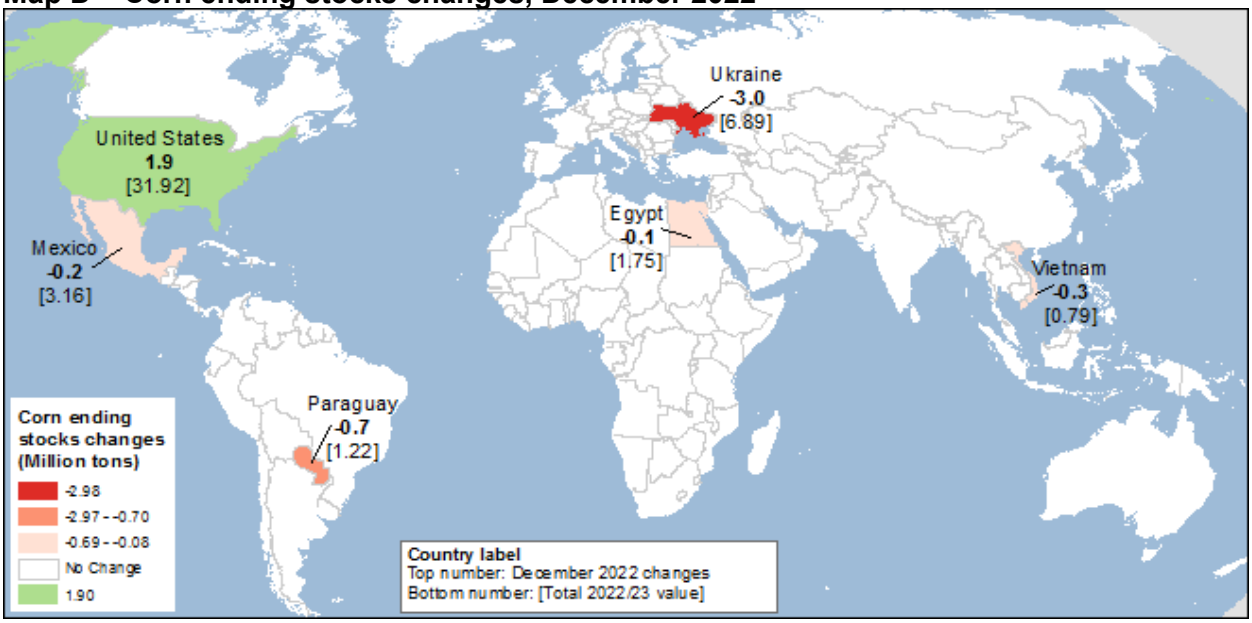


Source: USDA, Foreign Agricultural Service, *Production, Supply, and Distribution* database.

Global Coarse Grain Stocks Are Reduced

Global coarse grains ending stocks for 2022/23 are expected to be 2.2 million tons lower this month at 324.3 million tons. The revision primarily comes from ***Ukraine***, down 3 million tons, with a reduction in corn stocks due to lower corn production and increased exports. With lower projected exports, corn stocks in the ***United States*** are projected 1.9 million tons higher (see domestic section). Due to increases in coarse grain production this month, ***Canadian*** coarse grain stocks (mainly oats) are projected 0.3 million tons higher.

Map D – Corn ending stocks changes, December 2022



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

TRADE HIGHLIGHT: U.S. corn exports to Mexico, the largest importer of U.S. corn for 2021/22.

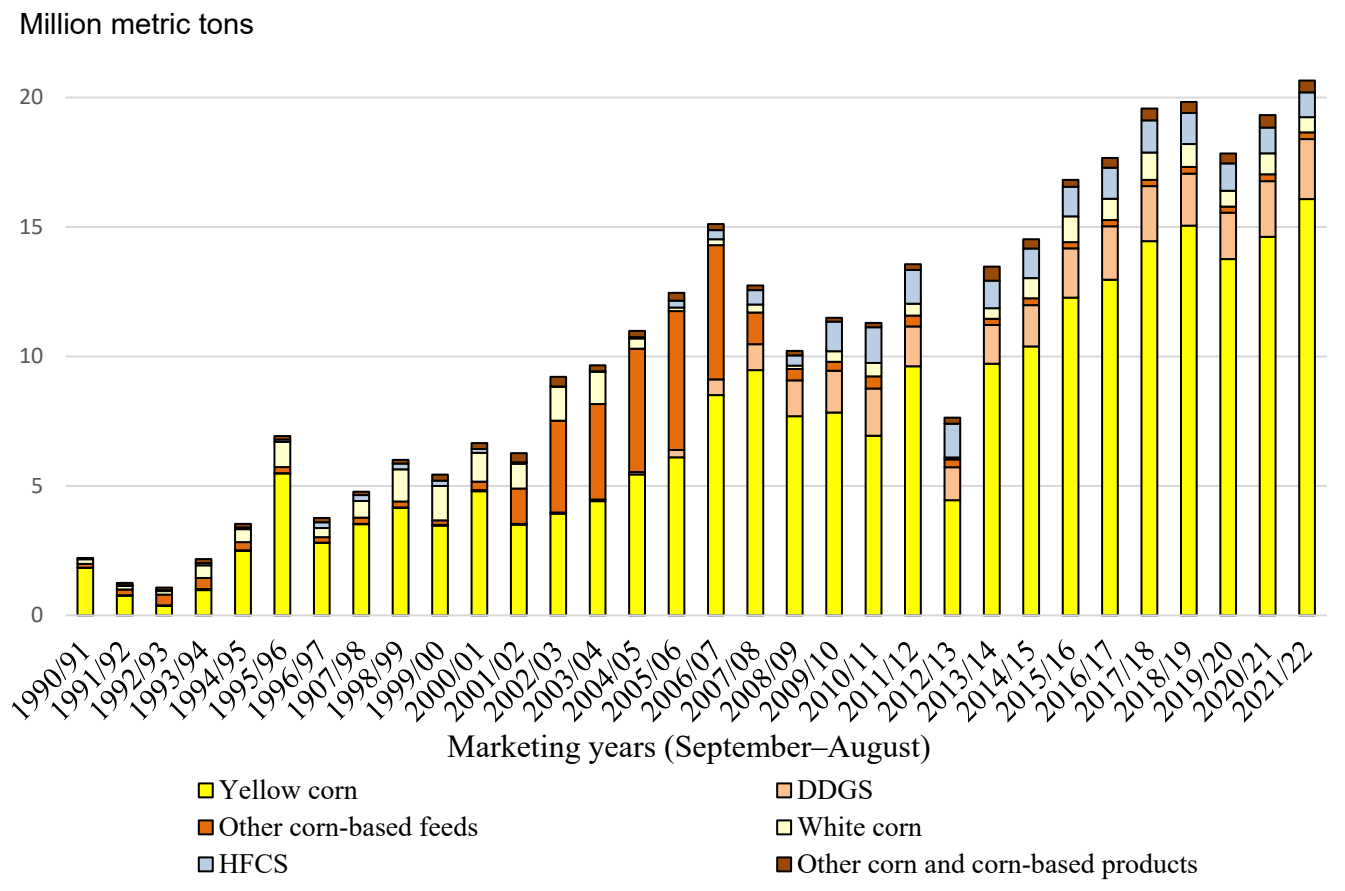
Angelica Williams, Steven Zahniser, and Jayson Beckman

Mexico is the largest destination for U.S. corn exports (followed by China), accounting for 27 percent of all U.S. corn exports in marketing year 2021/22 (September 2021—August 2022) in terms of volume. Given recent policy discussions in Mexico about the merits of genetically modified corn and the herbicide glyphosate, it is important to highlight market trends for exports of U.S. corn and corn-based products to Mexico.

Mexico relies heavily on imported corn from the United States, most of which is yellow corn used in livestock production. More than 90 percent of U.S. corn is genetically modified (USDA-ERS). Over the last 5 marketing years (2017/18–2021/22), yellow corn accounted for an average of 95 percent of U.S. corn exports to Mexico when distillers' dried grains with solubles (DDGS) (a high nutrient dense feed ingredient sourced from corn-based ethanol production) are included.

Mexico, on the other hand, grows predominantly white corn that is allocated for human consumption (tortillas and other food staples of Mexican cuisine). Over the past 5 years, an average of 4 percent of Mexican corn imports from the United States have been white corn. More recently, in the 2021/22 marketing year, yellow corn and white corn made up 89 percent and 3 percent of these imports, respectively. This number is up from 86 percent for yellow corn and down from 4 percent for white corn in 2020/21. No USDA production statistics are available on how much U.S. white corn is genetically modified.

U.S. exports to Mexico of corn and selected corn-based products, marketing years 1990/91–2021/22



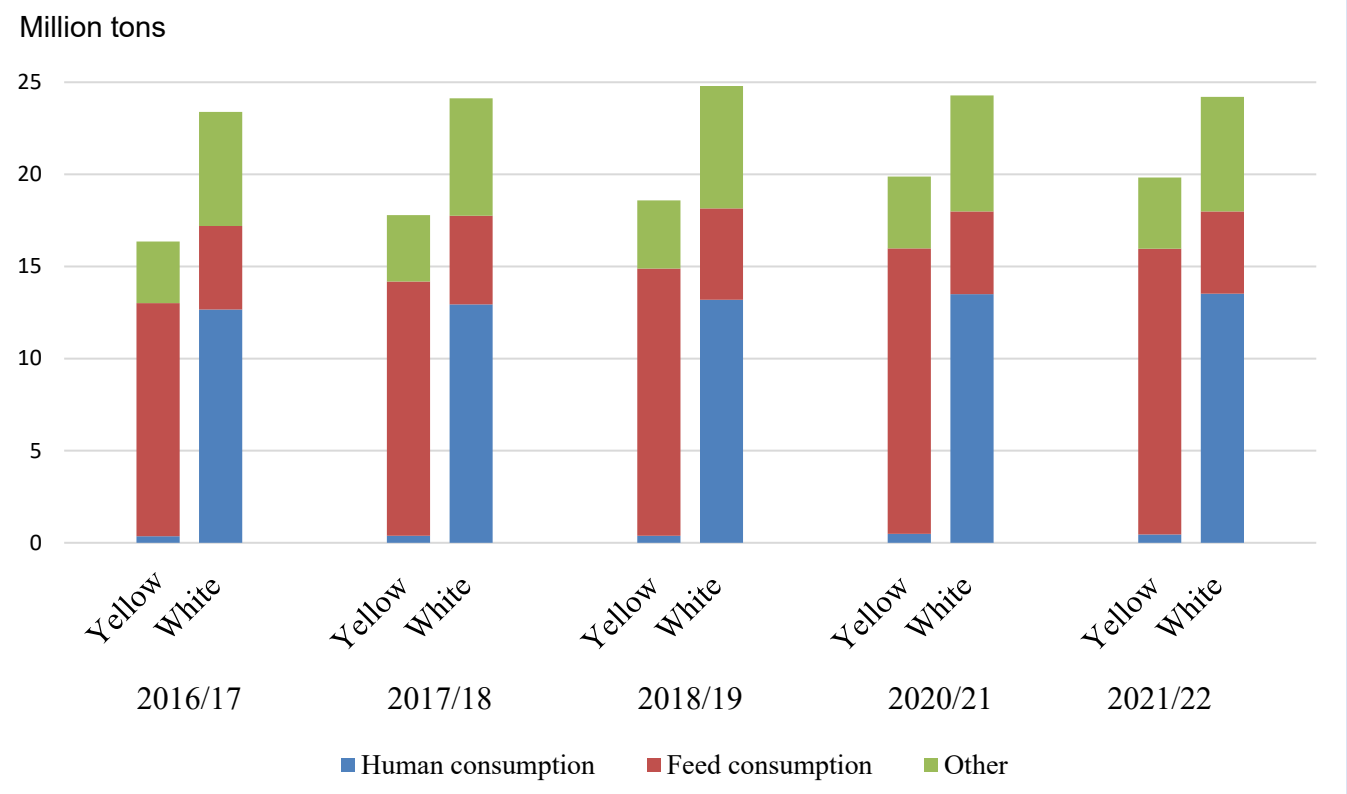
Note: HFCS = High-fructose corn syrup. DDGS: Distiller's dried grains with solubles.
Source: U.S. Bureau of the Census trade data.

TRADE HIGHLIGHT continued…

Total U.S. exports to Mexico of corn and selected corn-based products (mainly DDGS and high fructose corn syrup [HFCS]) for 2021/22 reached an estimated 20.7 million metric tons. When ethanol is included among these exports, their total value equaled about $7.7 billion in the 2021/22 marketing year.

Agricultural trade between the United States and Mexico is important for both countries. Mexico does not produce sufficient grains and oilseed to meet domestic demand, so the country's food and livestock producers import sizable volumes of these commodities to produce value-added products such as meat and vegetable oil (primarily for the domestic market). From a demand perspective, livestock consume the largest portion of yellow corn in Mexico, followed by other consumption (primarily industrial and seed), with human consumption accounting for only a small portion of yellow corn. Conversely, white corn is predominantly consumed by humans, followed by other consumption, while livestock consumes the smallest portion of white corn. The "other consumption" category includes the direct consumption of corn by farm families that raise that crop. That consumption can be destined for either food or feed use.

Mexico corn consumption by corn type, marketing years 2016/17–2021/22



Note: Marketing year 2019/20 is excluded due to incomplete data.
Source: USDA, Economic Research Service, using data from the Agricultural and Fisheries Information Service – Mexico Secretariat of Agriculture and Rural Development (SIAP-SADER, 2022).

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