



# Feed Outlook: May 2022

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## Tight Supplies in United States and World Raise Feed Grain Prices for 2022/23

U.S. corn production is projected to be 14,460 million bushels in 2022/23, a 4.3-percent decline from the 2021/22 estimate. Lower production projections result in tighter projected supplies and reduced use for the year. The season-average farm price for corn in 2022/23 is projected at \$6.75 per bushel, compared with the current 2021/22 estimate of \$5.90. Other feed grain prices are also projected to be higher year over year, due to strong demand for grains and elevated global commodity market prices.

World coarse grain exports in 2022/23 (October-September international trade year) are forecast to contract sharply, falling 3.7 percent from the estimated exports of 2021/22. This decline is a reversal of the situation observed in 2021/22, when record-high corn and sorghum (as well as near-record-high barley) exports boosted trade in coarse grains to a record-high volume. Lower **Ukrainian** export projections drive the decline in global trade. However, part of this shortfall is forecast to be offset by higher projected exports by a number of countries. For the world excluding Ukraine, coarse grain exports are actually forecast about 7 million tons higher. A drop in Ukrainian 2022/23 corn exports is expected to curtail China's imports. Total coarse grain imports by China are projected down 5 million tons to the lowest level in 3 years, despite a still substantial price wedge between the country's domestic and world prices. **U.S.** corn exports are projected down 1.5 million tons to of 62 million, still the 4th highest corn exports on record. While lower projected corn output and robust domestic demand are limiting exportable U.S. supplies of corn, a virtual absence of competition from Ukraine is expected to benefit U.S exports.

# Domestic Outlook

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## Less Planted Acres and Delayed Planting Progress are Projected To Constrain U.S. Corn Production Outlook for 2022/23

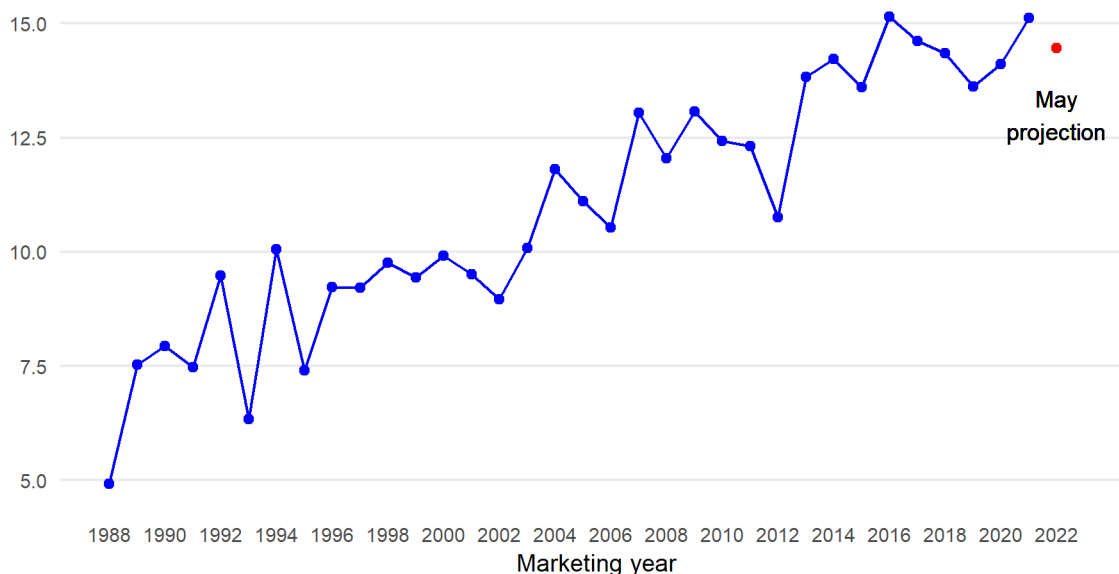
The USDA released the first official projection for 2022/23 in the May 12, 2022 *World Agricultural Supply and Demand Estimates (WASDE)* report. The United States is projected to have 15,925 million bushels of total corn supplies, down nearly 3 percent from the current 2021/22 estimate. The main reason for the lower projected supplies is less corn production expected for the upcoming marketing year that begins on September 1, 2022.

U.S. corn production is projected to total 14,460 million bushels in 2022/23—down 4-percent from 2021/22. The most important factors driving the current production outlook for the crop currently being sown are fewer acres planted and uncooperative weather conditions.

Figure 1

### Corn production, United States, 1988 to 2022

Billion bushels



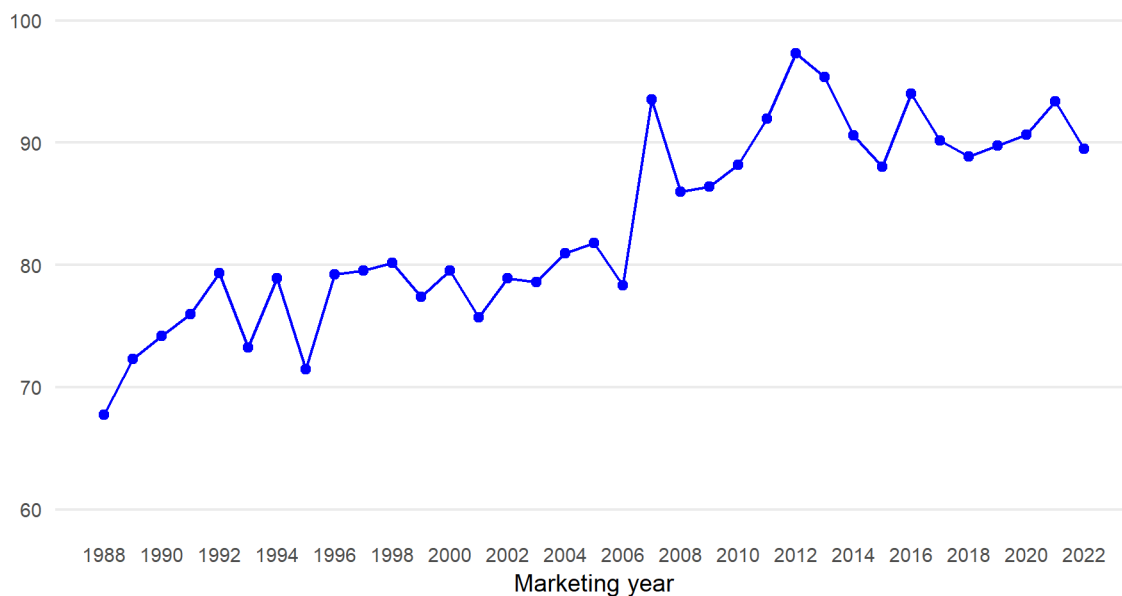
Source: USDA, National Agricultural Statistics Service.

On March 31, the USDA's National Agricultural Statistics Service (NASS) released its *Prospective Plantings* report, providing a survey-based forecast for planting intentions in the upcoming marketing year. Producers reported corn planting intentions of 89.5 million acres for 2022/23, down 4-percent from 2021/22 totals of 93.4 million acres. Based on historical levels of abandonment and corn harvested for silage, the *WASDE* report is projecting corn harvested area at 81.7 million acres in 2022/23. On June 30, NASS will release its *Acreage* report that will provide the first survey-based forecast for area harvested, as well as an updated estimate for planted area.

Figure 2

**Corn area planted, United States, 1988 to 2022**

Million acres

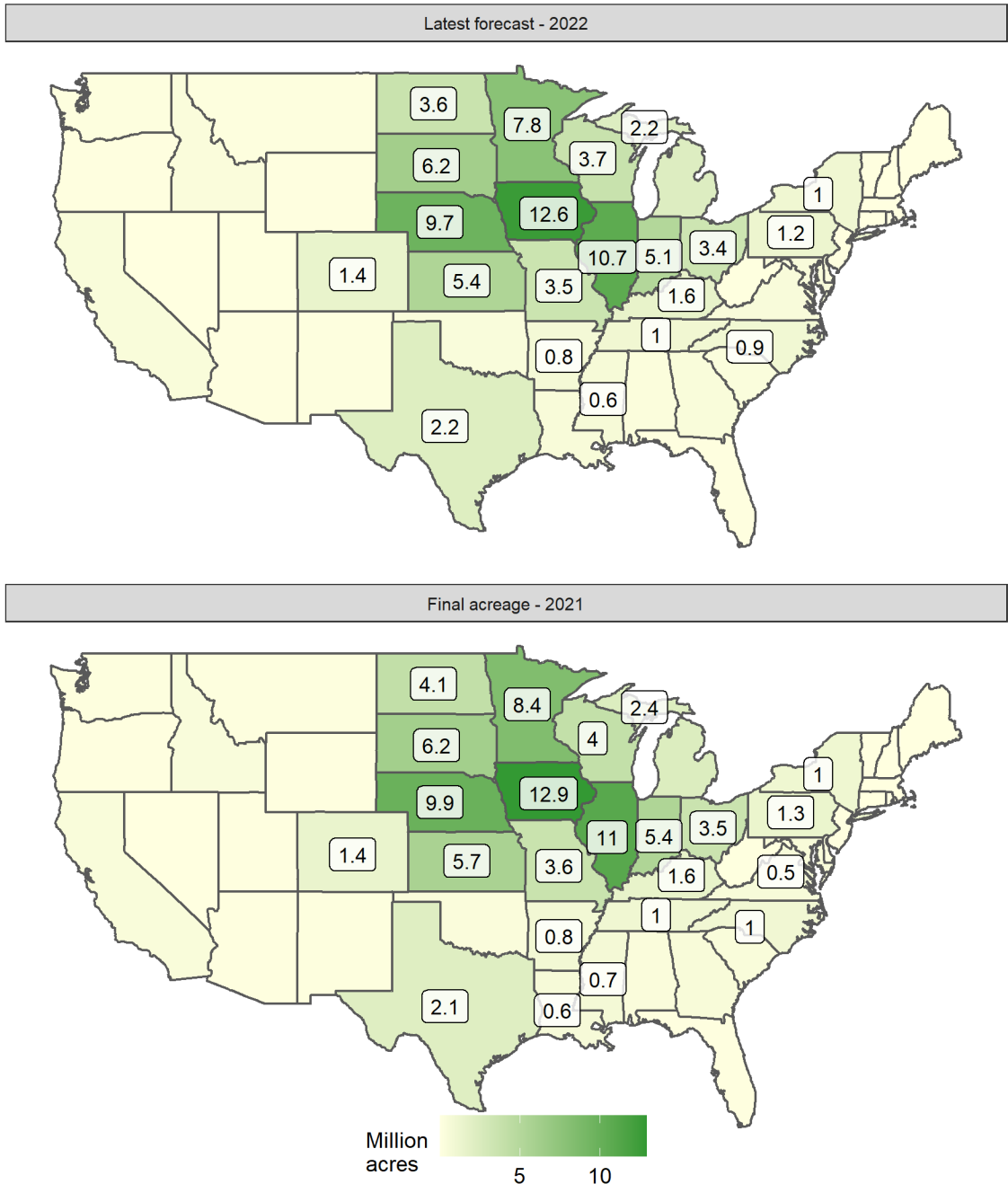


Source: USDA, National Agricultural Statistics Service.

State-level forecasts also indicated lower planting intentions than 2021/22, meaning the expected decline in planted area is broadly distributed. Yearly planted area declines were reported for most of the major corn-producing States, including: Iowa (down 2 percent), Illinois (down 3 percent), Nebraska (down 2 percent), and Minnesota (down 7 percent). South Dakota reported a 1-percent increase for 2022/23. Declines were also seen outside the Corn Belt, with yearly declines seen in places such as North Carolina and Louisiana. Texas—which has a large concentration of animal-feeding operations—shows a 2-percent increase of corn plantings for 2022/23.

Figure 3

**U.S. corn planted area, 2022 versus 2021 crop marketing year**



Note: Only States with more than 500,000 acres labeled.  
 Source: USDA, National Agricultural Statistics Service.

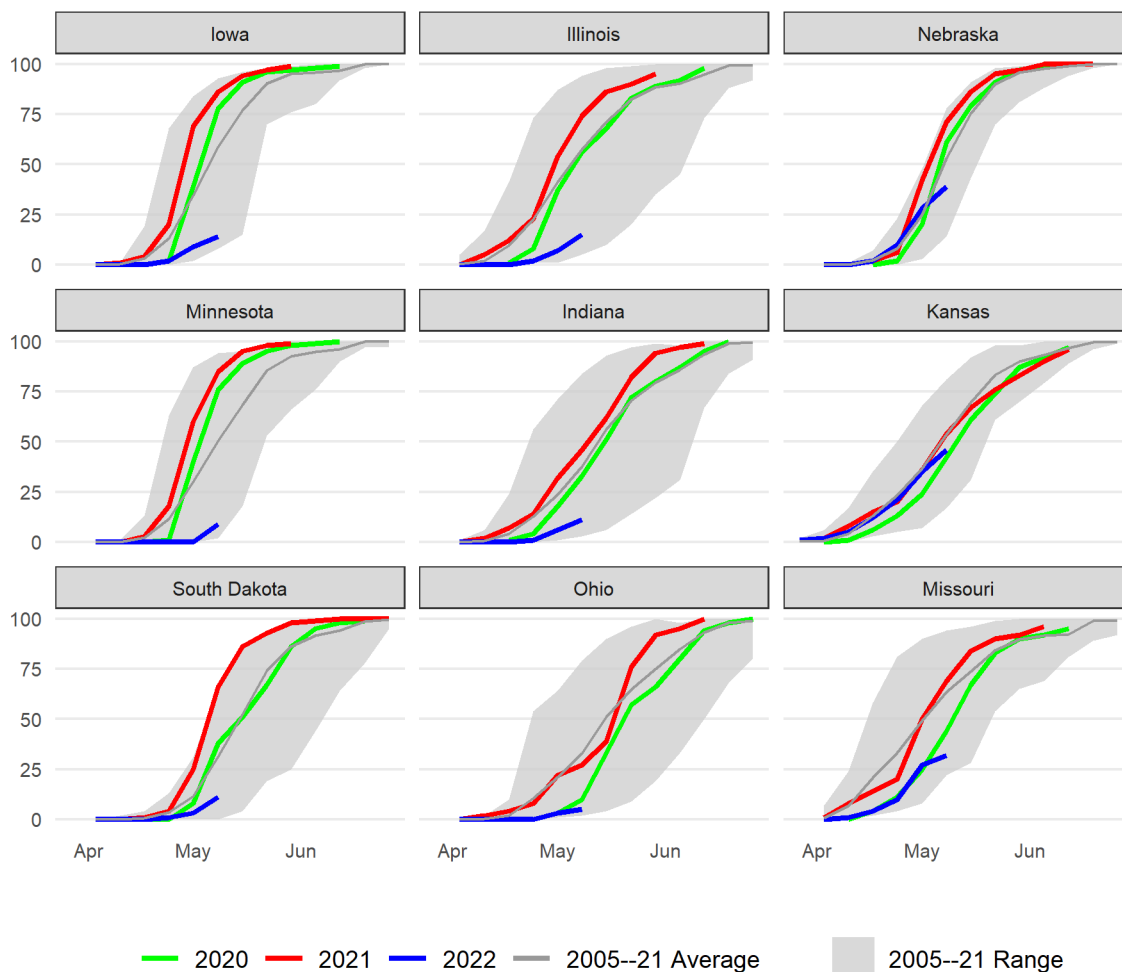
The U.S. corn yield for 2022/23 is projected to be 177.0 bushels per acres—essentially unchanged from the 2021/22 crop. The flat trend for yield is primarily due to the delayed planting progress for corn through May 8, as reported by NASS in its weekly *Crop Progress* report. The national average planting pace was recorded at 22 percent through May 8—

compared with 2021's total of 64 percent and the 5-year average of 50 percent by the same period. Cold and wet spring weather conditions throughout most of the Corn Belt have resulted in one of the slowest paces of plantings over the last two decades in that region. Only Nebraska and Kansas have seen planting progress near the historical pace, but even those States still lag. Given the widespread lack of progress throughout the United States, even with normal weather conditions, planting progress is likely to remain behind the historical pace for the remainder of May. Historically, delayed planting progress has been statistically associated with lower national-average yields—while also controlling for July temperatures and precipitation levels, and a severe precipitation shortfall during June. The first survey-based corn yield estimate from NASS will be released in the August *Crop Production* report.

Figure 4

**Corn planting progress by State, 2005 to 2022**

Percent complete



Source: USDA, National Agricultural Statistics Service.

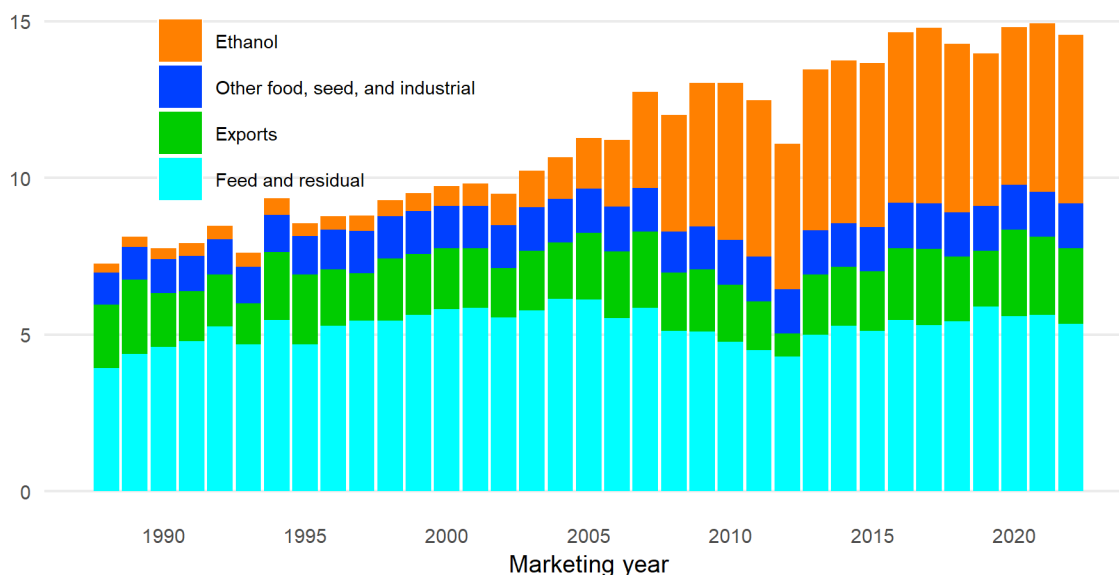
## Lower Corn Supplies Result in Less Corn Use for 2022/23

Domestic use and exports of corn will largely be impacted by the tighter supply outlook. Total corn use in the United States is projected to be 14,565 million bushels. The projection is nearly 3-percent lower than the current 2021/22 estimate of 14,935 million bushels.

Figure 5

### U.S. corn utilization

Billion bushels



Note: 2021/22 is estimated, 2022/23 is projected.  
Source: USDA, World Agricultural Outlook Board.

## Corn Export Projection Lower Annually, Strong Global Demand Still Expected

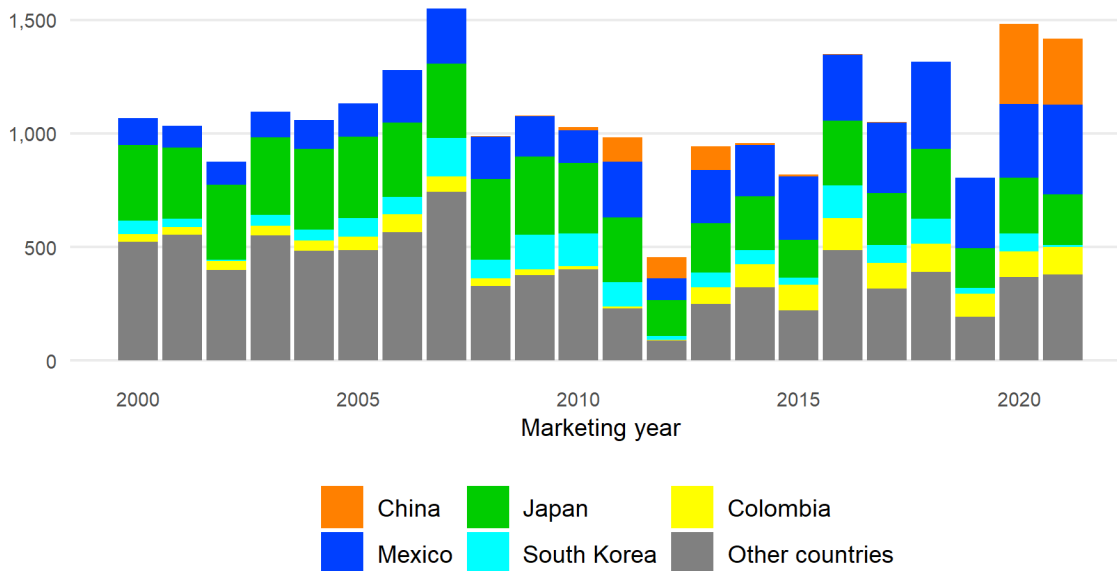
U.S. corn exports for 2021/22 are estimated to total 2,500 million bushels, unchanged from the April *WASDE* report. Through March, the United States has exported 1,417 million bushels of corn, according to data from the U.S. Bureau of the Census. The current export pace is 4 percent behind the record-setting 2020/21 export total. Much of that yearly decline can be attributed to less corn being shipped to China; although exports to China have still been substantially larger than historical levels. Additionally, the USDA's Foreign Agricultural Service's Export Sales Reporting Program data show that total commitments of corn exports (accumulated exports shipped, combined with remaining outstanding sales) were 2,303 million bushels as of May 5. By comparison, at the same point in 2020/21, total commitments were

2,667 million bushels—or 16-percent higher than the current levels for 2021/22. Additional sales during the remainder of the marketing year are expected, but the pace does not indicate exports to be as large as 2020/21.

Figure 6

**U.S. corn exports, September through March marketing years 2000 to 2021**

Million bushels



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

For 2022/23, U.S. corn exports are projected at 2,400 million bushels. If realized, the projected export total would be a 4-percent reduction from the current 2021/22 estimate. Strong global demand for U.S. exports is expected, due to limited corn and grain supplies across the globe—in particular, from Ukraine. However, high global prices are expected to ration demand, to a degree, in many countries. Additionally, the additional freight and logistics costs associated with moving corn from the interior of the United States to coastal ports would make marketing to domestic users more competitive in the projected high-price environment. Nonetheless, the current projection would still be fifth-largest marketing year export total in nearly 50 years behind: 2020/21, 2021/22 (estimated), 2017/18, and 1979/80. For more information on the global corn market outlook, see the [International Outlook](#) section of this report.

## Pace of Ethanol Production Slows During Spring, Ethanol Use Projected To Be Unchanged Year Over Year in 2022/23

Food, seed, and industrial use of corn in 2021/22 is estimated at 6,810 million bushels, including 5,375 million bushels of corn used for ethanol. Both of those estimates are unchanged from the

April WASDE report. According to NASS's *Grain Crushings and Co-Product Production* report, 3,144 million bushels of corn have been used for fuel ethanol through March of the 2021/22 marketing year. The current pace is nearly 10-percent higher than the same period in 2020/21 and is the highest rate of ethanol use, going back to 2017/18.

Weekly reporting from the U.S. Department of Energy's Energy Information Administration (EIA) show that ethanol production rates have pared back, beginning in early April. The lower ethanol production aligns with spot-market operating margins that have been lower since the end of December 2021. EIA has also reported relatively lower motor gasoline product supplied since January 2022, which means there has been a smaller domestic market for fuel ethanol demand.

Food, seed, and industrial use for 2022/23 is projected to total 6,815 million bushels—slightly higher than the 2021/22 estimate. Corn used for fuel ethanol is projected to be the same as 2021/22 estimates at 5,375 million bushels, however. Ethanol demand is expected to be dependent on gasoline consumption—which is primarily a function of light-duty vehicle miles driven. Higher corn prices have been matched by higher ethanol prices thus far in 2022. However, the market conditions that resulted in historically high operating margins for ethanol mills between October and December 2021 are unlikely to repeat in 2022/23, which dampen the prospect of ethanol production in 2022/23 relative to the current year.

Higher prices, relatively smaller livestock inventories, and a smaller expected crop size for the 2022/23 marketing year, are all expected to reduce corn used for feed and residual. Feed and residual use is projected to be 5,350 million bushels in 2022/23—a 5-percent reduction from the current estimate of 5,625 million bushels in 2021/22.

## Lower Corn Ending Stocks and Higher Prices Expected in 2022/23

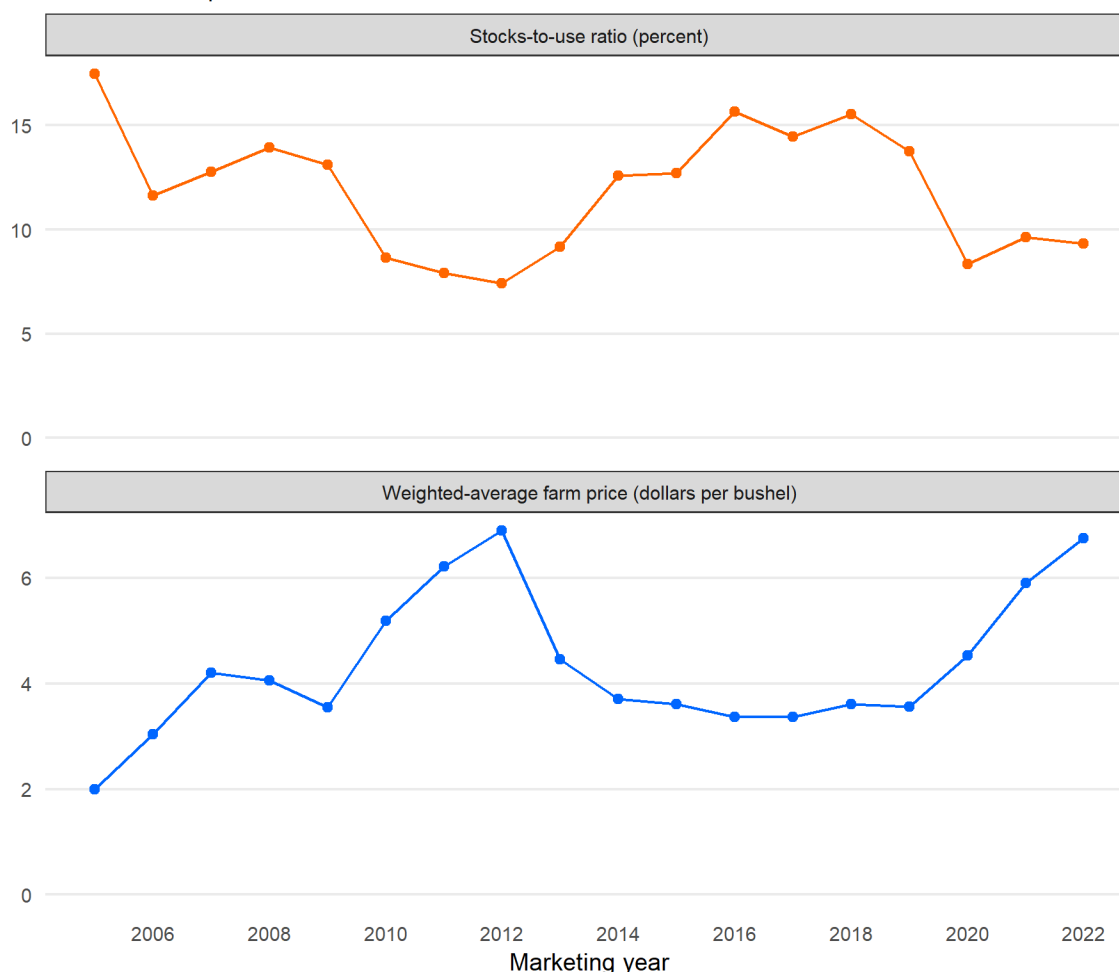
Even with declining use, the current corn supply outlook results in a tight market outlook for 2022/23. U.S. corn ending stocks for 2022/23 are projected to be 1,360 million bushels, which would result in a 9.3 percent stocks-to-use ratio. By comparison, the 2021/22 ending stock estimate of 1,440 million bushels results in stocks-to-use ratio of 9.6 percent.



Figure 8

### U.S. corn stocks-to-use and farm prices

Percent or dollars per bushel



Note: 2021/22 is estimated, 2022/23 is projected.  
 Source: USDA, Economic Research Service and National Agricultural Statistics Service.

Increased prices are projected as a result of relatively tight supplies, as well as the overall increase in price levels seen broadly in commodity markets. The season-average farm price is projected to be \$6.75 per bushel in 2022/23. The 2022/23 projection is \$0.85 per bushel higher than the current estimate for 2021/22, which is now to \$5.90 per bushel.

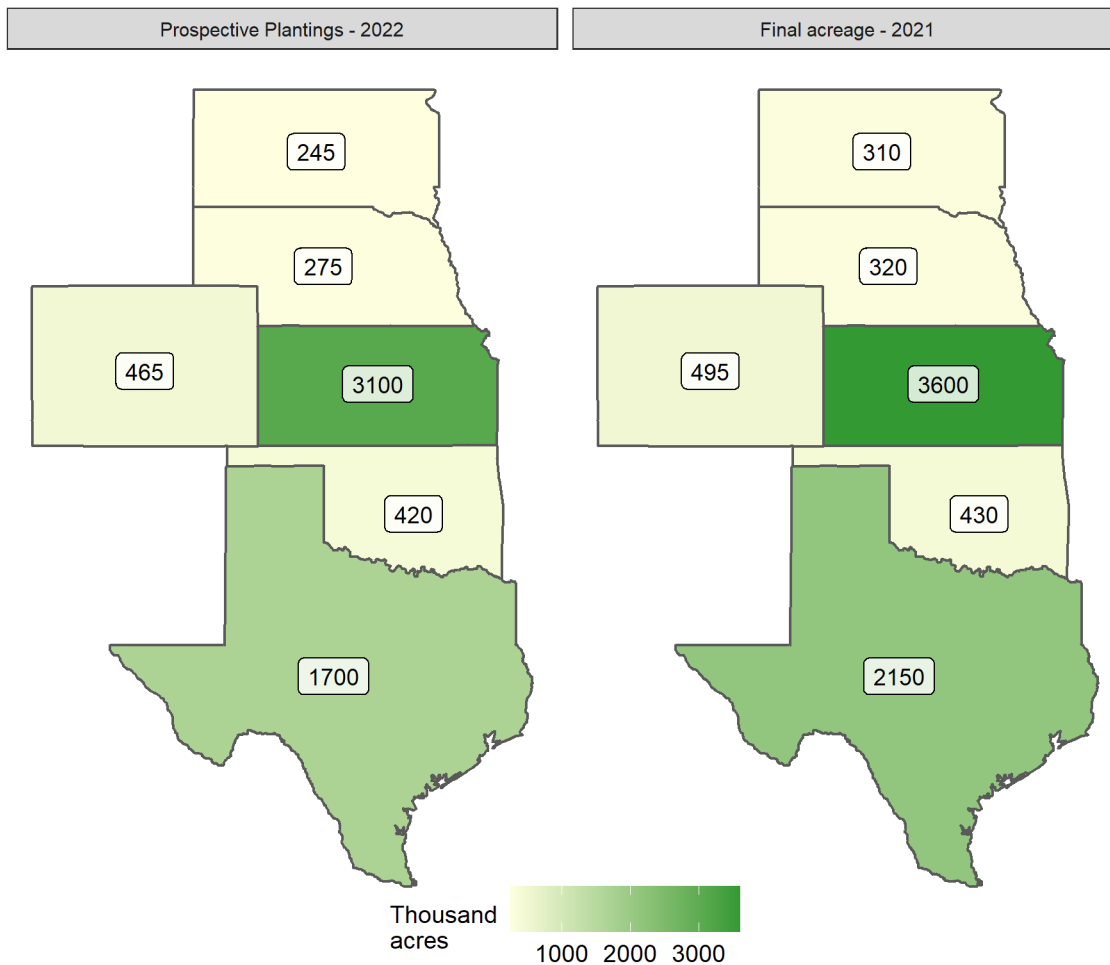
## Lower Sorghum Production Prospects for 2022/23 Driven by Reduced Sorghum Area

U.S. sorghum production in 2022/23 is projected at 381 million bushels, a 15-percent reduction from 2021/22. According to NASS's *Prospective Plantings* report, producers are expected to plant 1.1 million fewer acres in 2022/23, with an estimated 6.2 million acres planted. Lower planting intentions are reported across all the sorghum-producing states. Kansas is expected to

see the largest decrease in planted acreage, with a 500,000-acre reduction—followed by Texas, with a 450,000-acre reduction from the prior year. Sorghum yield is projected at 69.3 bushels per acre for 2022/23, based on the 20-year median, slightly higher than last year’s 69 bushels per acre.

Figure 9

**U.S. Sorghum planted area, 2021 versus 2022 crop marketing year**



Source: USDA, National Agricultural Statistics Service.

Sorghum total use is projected to be 10-percent lower than last year, with a total use of 390 million bushels for 2022/23. Sorghum exports are projected at 285 million bushels in 2022/23, 5 percent lower from the 2021/22 estimate. The season-average farm price for sorghum in 2022/23 is projected at \$6.65 per bushel.

For 2021/22, the domestic sorghum use estimate is 5 million bushels higher than the April *WASDE* report at 135 million bushels—mainly due to higher food, seed and industrial use.

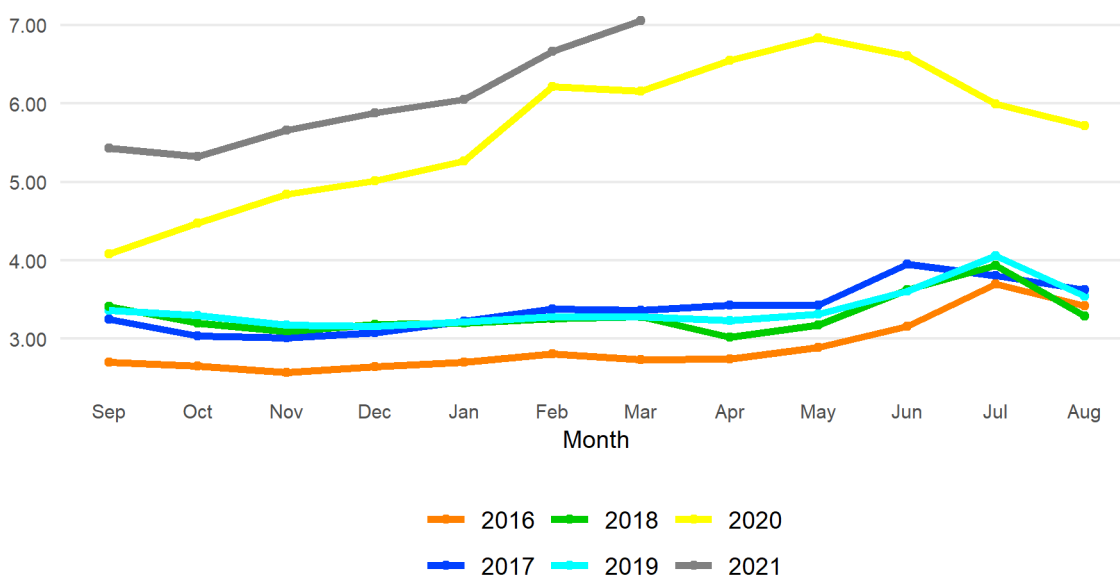
Sorghum exports are reduced to 300 million bushels, reflecting the pace in sorghum exports witnessed from September through March.

The projected season-average farm price of sorghum is estimated at \$5.95 per bushel in 2021/22, up \$0.10 from last month and consistent with the upward trend observed in NASS's reported monthly price received. Prices received were reported to be \$7 per bushel for the month of March; up \$0.34 from February and the highest price observed for the current marketing year.

Figure 10

**Price received for sorghum, monthly**

U.S. dollars per bushel

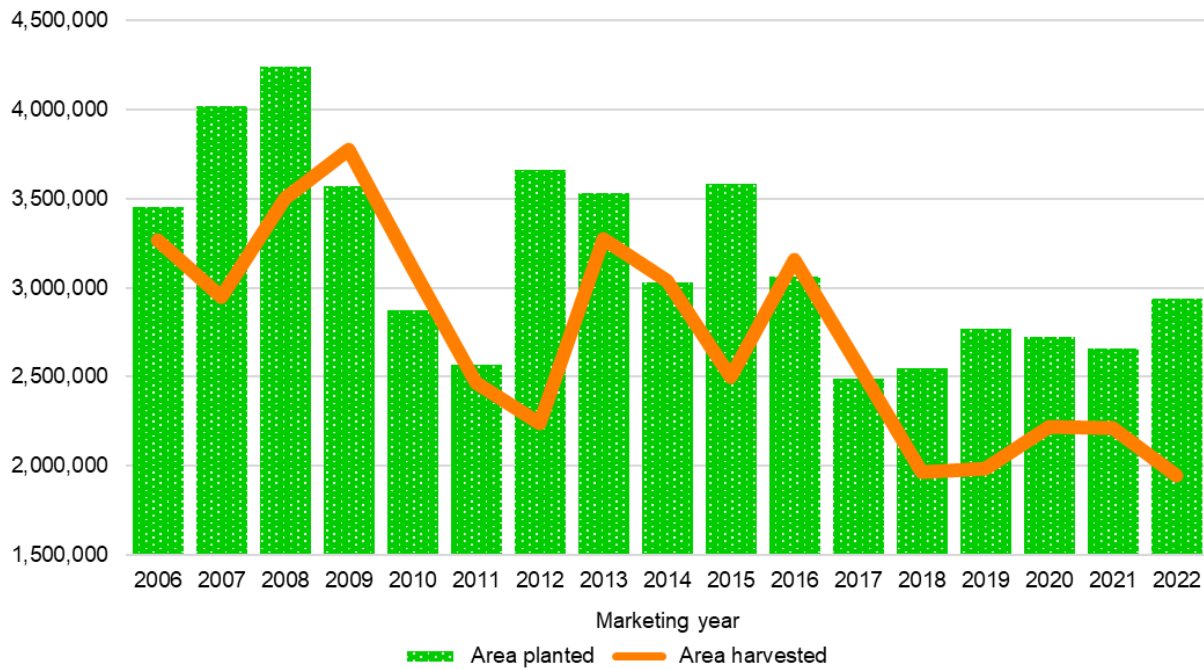


Source: USDA, National Agricultural Statistics Service.

## Barley Production Projected Higher in 2022/23, as Higher Prices Drive Increased Planted Area

Barley production is projected to be 181 million bushels for 2022/23, a 54 percent jump from 2021/22 production estimates—based on increased planted area and an expected return to trendline yields, following last year's historic drought in the Northern Plains. In its *Prospective Plantings* report, NASS reported that 2.9 million acres of barley are expected to be planted in 2022, the highest in 5 years, as producers respond to historically strong barley prices.

Figure 11  
**Area planted and harvested for U.S. barley**  
 Acres



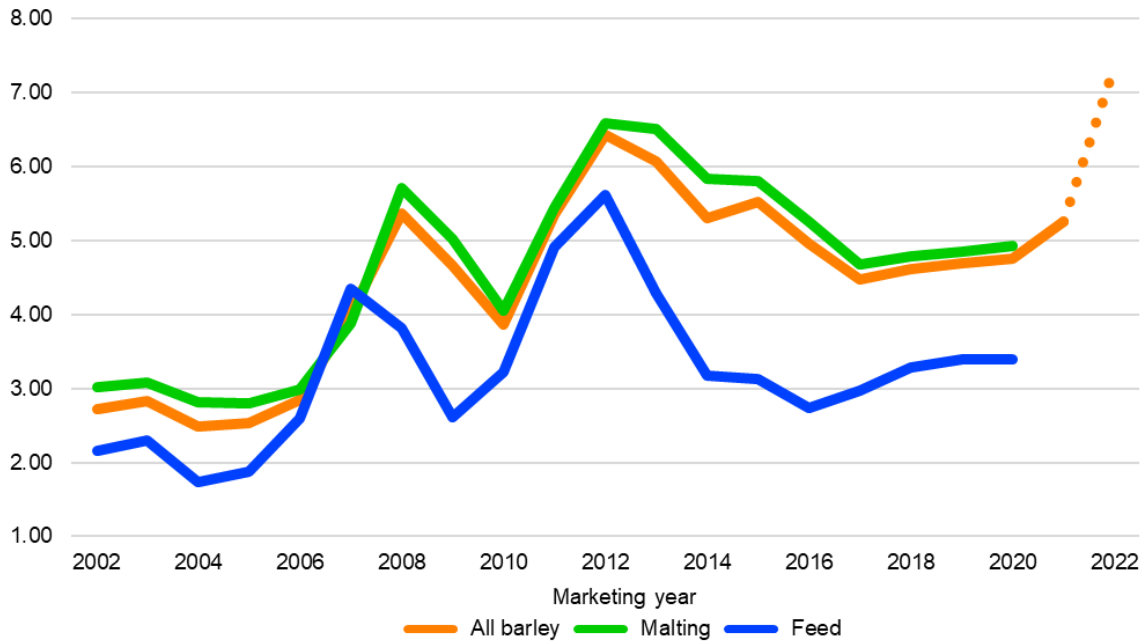
Note: Area planted before 2022 is the final estimate, area planted in 2022 is projected.

The season-average farm price for barley is projected to reach \$7.35 per bushel in 2022/23, the highest level in at least 60 years—as strong demand for feed grains, compounded by recent global geopolitical tensions, support both feed and malting barley prices. With yields projected at 75.5 bushels per acre based on trend—compared with the 60.4 bushels per acre for the 2021/22 crop, and only slightly lower imports—total supplies are projected to rebound 23 percent from last year to 247 million bushels.

Figure 12

**Price received for all barley, malting, and feed, by marketing year**

U.S. dollars per bushel



Note: 2021/22 is an estimate, 2022/23 is projected.

U.S. barley use is also projected to increase in 2022/23 to 167 million bushels, up 16 percent from last year. The increase is forecast to come from more food, seed, and industrial use—145 million bushels projected in 2022/23, compared with 115 million bushels estimated for the year prior. Feed and residual use (15 million bushels) and exports (7 million bushels) are both projected to decline slightly from last year’s estimates. Barley ending stocks in 2022/23 are projected to rebound from the 2021/22 estimate to 80 million bushels.

## Oat Supplies Projected To Recover in 2022/23

Oat production in 2022/23 is projected to be 59 million bushels—a 49-percent increase from the drought-affected crop from 2021/22. Improved production prospects in Canada result in a recovery of imports for the next marketing year, as well. Total oat supplies in 2022/23 are projected at 182 million bushels, a 17-percent increase from the 2021/22 estimate of 156 million bushels.

Total oat use in 2022/23 is projected at 148 million bushels, up 16 percent from the 2021/22 estimate. Most U.S. oat use is accounted for by domestic food, seed, and industrial use—projected at 81 million bushels. The biggest year-over-year change is projected feed and residual use at 65 million bushels, compared with 45 million bushels estimated for 2021/22. The

projected feed and residual use returns to levels that are more in line with historical averages. Season-average farm prices for oats are still projected to be significantly higher than average, however. The projected 2022/23 price is \$5.70 per bushel, compared with the updated 2021/22 estimate of \$4.40 per bushel. The increase is due to high cash-market prices carrying over into the new marketing year (which begins on June 1) and the broad support for commodity prices throughout the economy.

## Grain Consuming Animal Units Projected Lower for 2022/23

Total feed grain and wheat feed and residual use is projected at 142.2 million metric tons (MT) for 2022/23, compared with an estimated 126.9 million MT for 2021/22. Corn feed and residual use still accounts for the great majority of the total, falling from 142.9 million MT estimated for 2021/22 to 135.9 million MT projected for 2022/23. Wheat feed and residual offsets some of that decline, increasing from an estimated 1.0 million MT in 2021/22 to 2.7 million MT in 2022/23.

Grain-consuming animal units (GCAUs) are projected to be 98.9 million units in 2022/23, which is a 1-percent decrease from the current 2021/22 estimate. In particular, projected GCAUs for cattle-on-feed are 8-percent lower in 2022/23, at 20.8 million units. Lower cattle inventories and higher placement rates during 2021/22 are likely to result in a lower pipeline of feeder cattle during the 2022/23 marketing year.

# International Outlook

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## 2022/23 Coarse Grain Production Prospects Sharply Down

World coarse grain production in 2022/23 is forecast down 22.5 million tons (1.5 percent) from the previous year to 1,475.9 million. Much of the change is attributed to a decline in U.S. intended planting, as reported in the March 31 *Prospective Plantings* report—exacerbated by poor planting conditions, and the drastic war-induced decline in Ukraine that is expected to see a 31-percent reduction in its coarse grain area (see the feature on Ukraine below). U.S. coarse grain production in 2022/23 is projected to slip 16.6 million tons, or 4.1 percent from a year earlier, while foreign production (defined as global minus the United States) is expected to decline by 8.9 million tons, or 0.8 percent.

The May initial assessment of world coarse grain supply and demand is always highly tentative, as spring planting is still underway in the Northern Hemisphere and months away in the Southern Hemisphere, where the previous year's crop is still being harvested. This year, the uncertainty of the forecast is exacerbated by the war in Ukraine.

For most countries and grains, trend yields are assumed because planting and growth have not progressed enough to justify a departure from trend. Trend yields imply average weather—a mix of favorable and unfavorable weather. However, for fall planted coarse grains, (especially winter barley and rye planted in the Northern Hemisphere) yield forecasts are adjusted to account for weather conditions.

### Area Projections

Global corn harvested area in 2022/23 is projected 3.6 million hectares lower to reach 202.7 million, with a large part of the decline (1.5 million hectares) coming from the United States (see the [domestic section](#) of the report above). Foreign corn area is projected 2.1 million hectares lower, driven by a drastic cut in Ukrainian grain area. The largest increase in corn area is projected for Brazil, up 0.9 million hectares. Corn prices have been running historically high since end of February. However, the war-related surge in input prices throughout the world is limiting incentives to expand corn area in a number of countries, suggesting a shift to grains with lower input-per-acre requirements, like from barley and oats to oilseeds.

Global barley area (excluding Ukraine), whose area is projected 25 percent lower, is projected 0.5 million hectares higher year over year. Several major producers, such as the European Union and Turkey, are shifting away from wheat and corn to barley—although in North Africa, barley area is reduced mainly because of the drought in western Morocco. The United States is a minor barley producer, but its barley area for 2022/23 is projected up 23 percent.

Sorghum area is projected 1.6 percent down—the lion's share of the reduction coming from the United States (see [domestic section](#) above), India, and Australia. Sorghum area in Sub-Saharan Africa is projected to increase.

Oats area is projected up 5.4 percent, with an increase in the United States (up almost 30 percent) as well as in Canada, Australia, and Russia.

### **Regional/Country Coarse Grain Production Prospects for 2022/23**

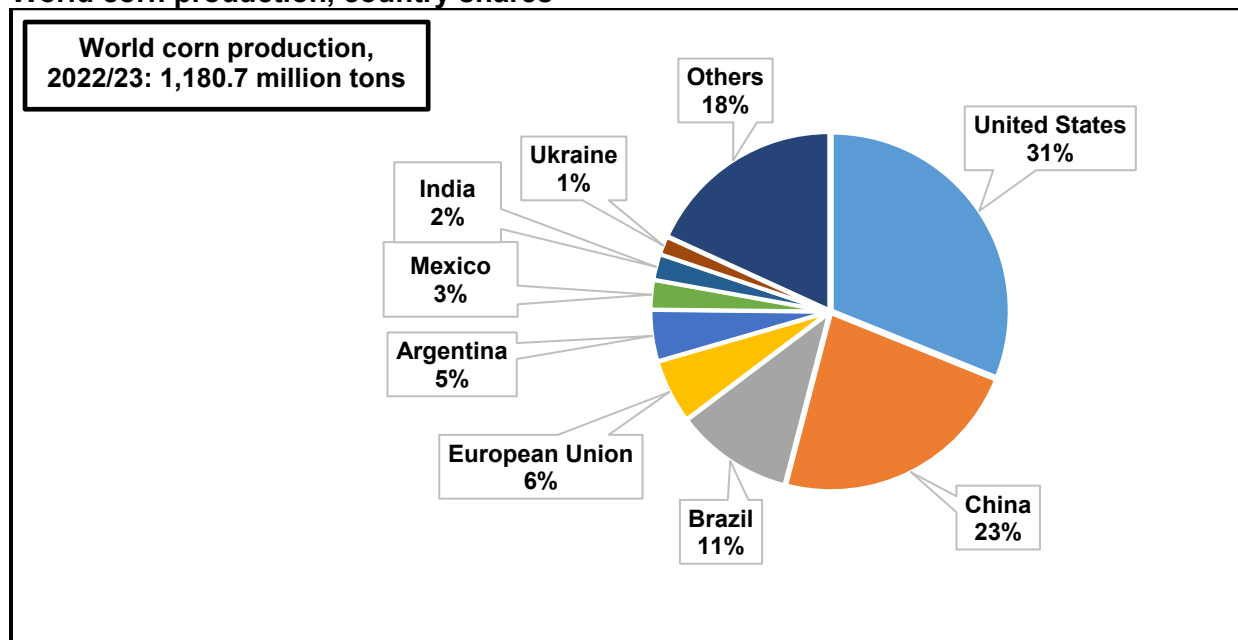
For the last 10 years, global **corn production** has been dominated by 8 countries (regions) that produce more than 80 percent of the world's corn. The United States is the top producer—though its world output share that used to be above 40 percent has been in the range of 30–34 percent since 2011—a year when Brazilian corn output made a 30-percent jump and Ukrainian corn production doubled. With a drastic reduction in its corn output, Ukraine's share in global corn production for 2022/23 is projected at just 1.3 percent—less than half compared to last year and below the shares of Mexico, India, and South Africa.

See figure 13 below for the projected countries' share in global corn production.



Figure 13

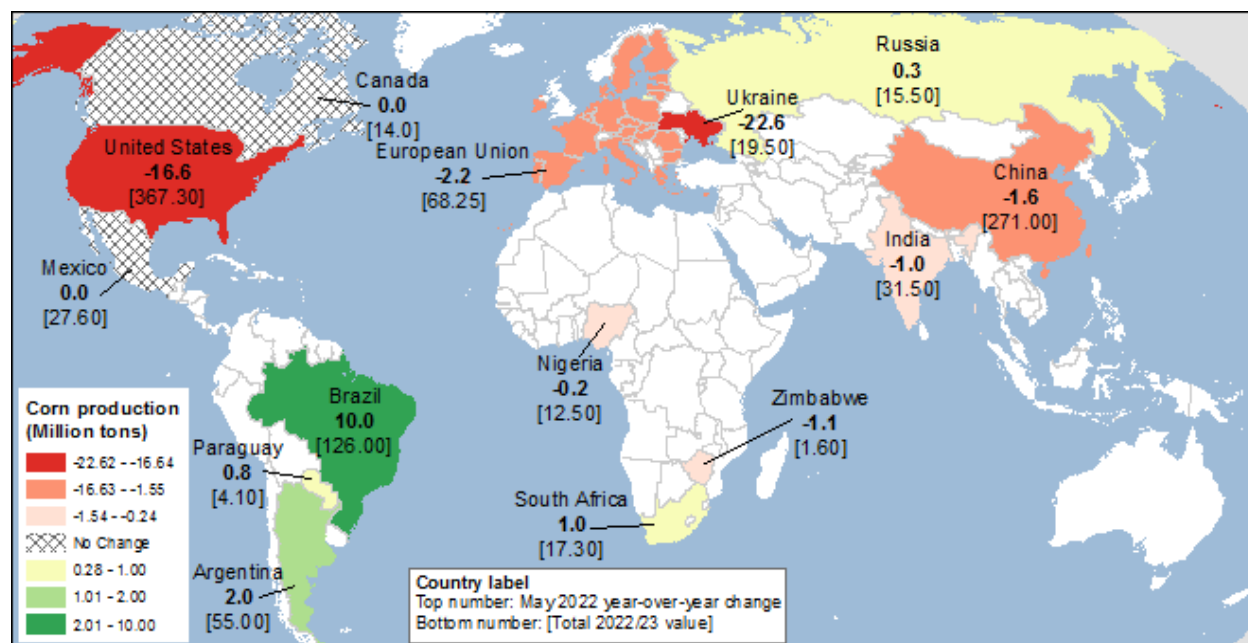
### World corn production, country shares



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

Global **corn output** for 2022/23 is projected 34.9 million tons down on the year at 1,180.7 million. The largest reductions come from **Ukraine** and the **United States**. Map A below presents the forecast for major corn producers and year-over-year changes in corn output.

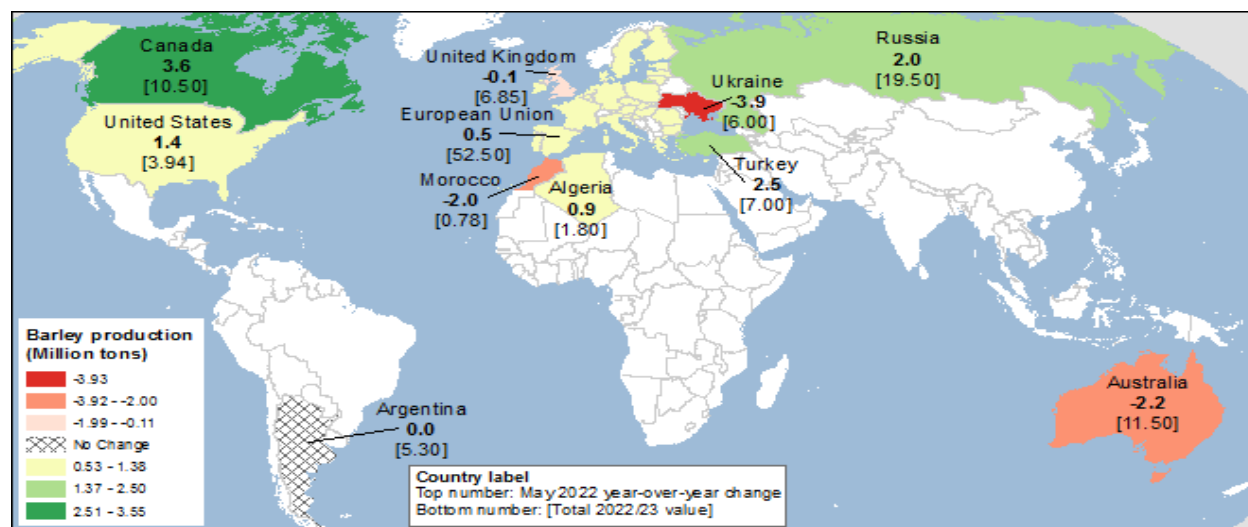
### Map A – Major year-over-year changes in corn production for 2022/23



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

World **barley production** is projected to reach 149 million tons in 2022/23, up 3.9 million from a year earlier. This increase is projected, despite a cut in Ukrainian barley area and output, as a number of countries bounce back from last year's low yields. Though a small producer, the United States accounts for a third of the global increase. Foreign barley production is up 2.6 million tons to 145 million. Less expensive seeds and lower input requirements make barley more attractive to farmers in the setting of high input prices, but unfavorable winter weather has limited production prospects in some countries. See map B below for the barley production forecast and year-over-year changes.

**Map B – Major year-over-year changes in barley production for 2022/23**



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

One of the major factors shaping grain supply and demand projection for 2022/23 is the consequence concerning the Russian military invasion of Ukraine, as the war involves two major grain-producing and exporting countries. Russia is not a battleground, and though the Russian economy is being hit by Western economic sanctions, its agricultural sector does not seem to be negatively affected. At the same time, the war has disrupted the physical, logistical, human, and market infrastructure in Ukraine—an important supplier of wheat, corn, barley, and sunflower oil to world markets. Our first 2022/23 grain supply and demand forecasts are highly tentative, as the situation is evolving, and will be updated using the best available knowledge of current economic and agricultural conditions in both Ukraine and Russia.

See below a feature on the current agricultural projections for **Ukraine**.

## COUNTRY FOCUS

### Projecting Ukraine's Grain Economy Developments in a Time of War and Uncertainty

Russia's military invasion of Ukraine has created extreme uncertainty concerning the production and export of Ukrainian grain. Although the conflict is still evolving, the key developments that will determine the degree to which Ukraine will be able to produce and export grain are how long the fighting lasts, and what—if any—Ukrainian territory Russia holds if peace, or even just a cease-fire, is established. The war will affect grain production in two adverse ways, by reducing both crop area and yields.

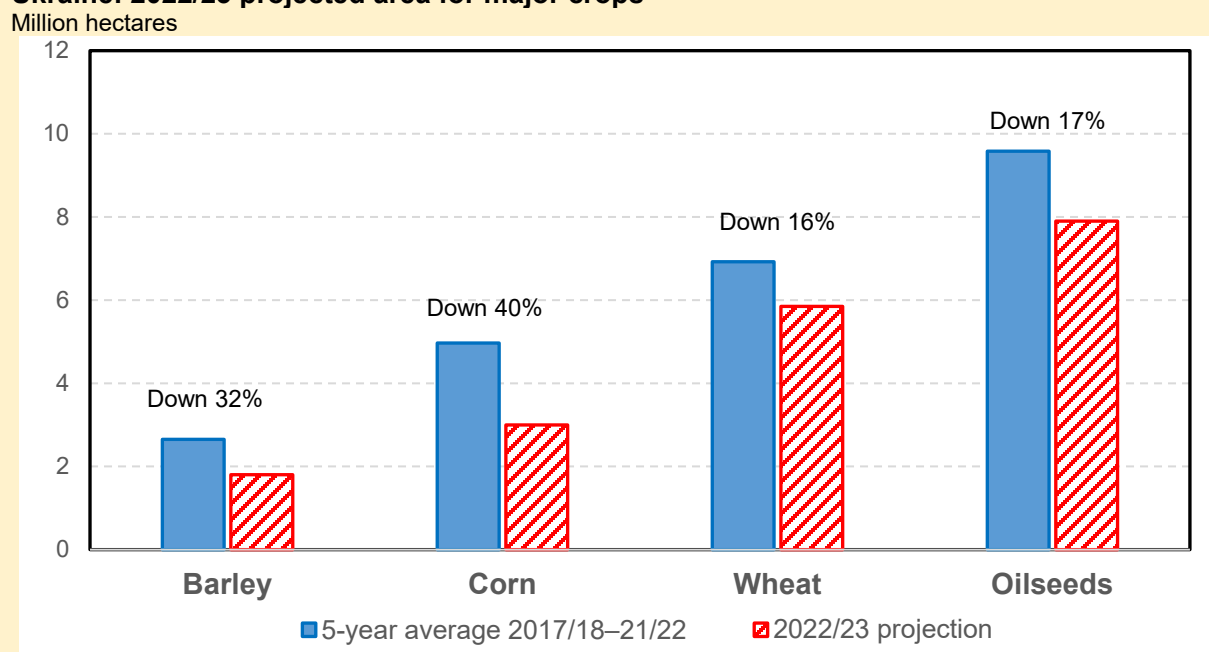
Planted (and then also harvested) area for the 2022–23 crop year is expected to be impaired by war-related developments. Clearly, the territories where fighting continues, as well as those parts of the country that were recently freed but the departing Russian forces left mined fields behind, will be planted only sparingly. However, the main problem for Ukrainian farmers is a **drastic reduction in grain export prospects**. The bulk of Ukrainian grain exports—that could exceed 6 million tons a month—used to come out of its Black Sea ports. Russia currently holds much of Ukraine's coastal territory (including that along the Sea of Azov) and is blockading the unoccupied ports (such as Mikolaiv and the country's top port of Odesa). This precludes Ukraine from exporting any grain out of the Black Sea, such that the country is shipping a small part of its potential grain exports by rail to the west, mainly through Romania and Poland. Limited exports are driving up grain stocks, projected to reach an unusually high level that is likely to strain Ukraine's storage capacity. With so much unsold grain within the country and high stocks, domestic grain prices have become depressed (at the same time that the Russian blockade of Ukraine has contributed to the significant rise in world grain prices). Reduced Ukrainian domestic grain prices and the uncertainty that output will be exportable are sharply reducing farmers' incentive to plant.

Among other factors that are expected to decrease both grain area and yields in Ukraine are reduced availability of inputs—quality seeds, fertilizer, diesel fuel, credit availability—and damaged infrastructure and storage capacities. The war and its disruptions (including to commercial and business infrastructure) are upsetting the flow of inputs to producers and impeding their ability to plant, apply fertilizer, harvest, and transport grain. The war has also caused a jump in agricultural input prices in Ukraine. Prices for fertilizer are strongly correlated with those for energy (the cost of natural gas being more than two-thirds of the total production cost of nitrogen fertilizer) and Russia is one of the largest producers and exporters of oil, natural gas, and fertilizer. Higher prices will further limit producers' input use. Nitrogen use in corn is

one piece of a complex biological system that interacts with several factors—such as weather, current soil supply of nitrogen, and the type of hybrid seed used. Although weather is the major factor determining deviations from trend yield, lower input use can—*ceteris paribus*—reduce yields and consequently affect production volume.

For 2022/23, Ukrainian crop area is projected to be about 20 percent lower than the recent 5-year average, but this reduction is not similar across crops. Corn area has the largest decline, down 30 percent from the recent 5-year average (about the percentage of usual corn area that has been affected by war) and is projected at about 65 percent of last year's corn area. Corn is a cash crop, meaning that farmers grow it mainly to export, and domestic corn use is low. As discussed earlier, the current inability to ship grain out of seaports is creating large surpluses—further depressing domestic corn prices and thereby weakening farmers' incentives to plant. Furthermore, corn is generally the most input intensive among the grain crops and thus the most exposed to risk of loss, should prices be below cost of production. Nitrogen fertilizers are in short supply in Ukraine, and their prices are running high. This makes the planting of corn a relatively costly option, in comparison to oilseeds and other crops (e.g., buckwheat, millet, potatoes), which require less nitrogen and/or can be consumed within the country. A smaller reduction in area is projected for barley, as about half of the crop was planted in the fall (as was almost all wheat in Ukraine). See figure A below for the area projections for the four major Ukrainian crops.

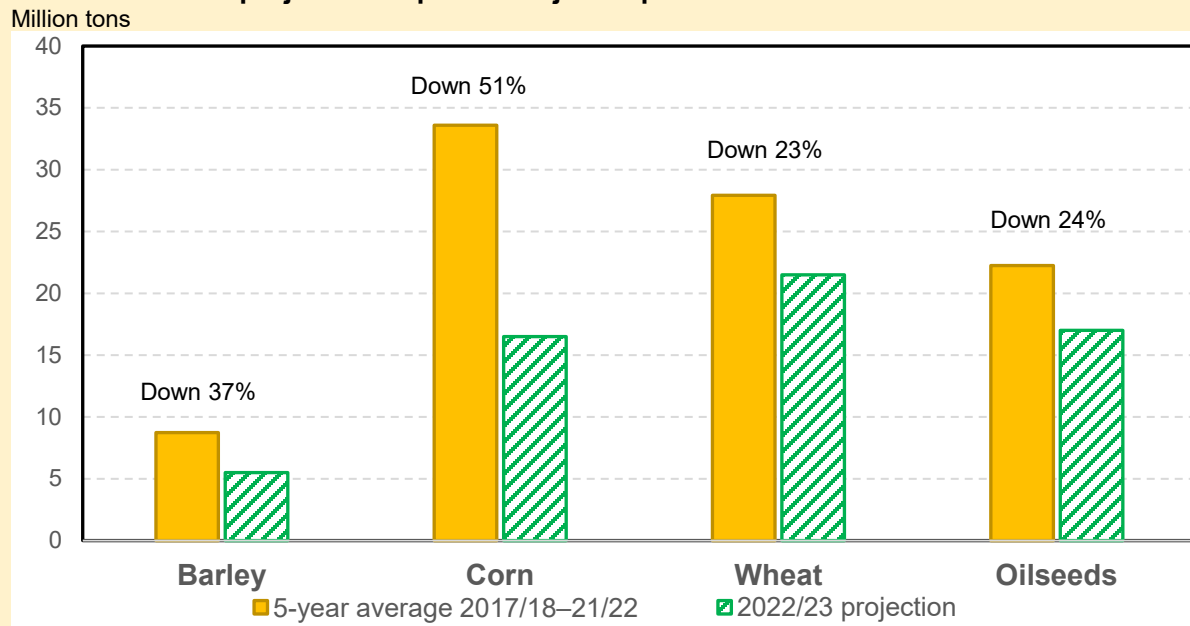
Figure A  
**Ukraine: 2022/23 projected area for major crops**



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

Yield projections are based on historical averages and trends, as well as analyst judgement of the impacts of input availability, among other factors. Projections for grain yields in the coming year in Ukraine (as a result of the war) are even more uncertain than they would normally be at this time of the production cycle than are the area forecasts. Low input use (and especially insufficient amounts of fuel for fieldwork) increase the probability of below-trend yields (though weather continues to be the main driving force for yields). The largest cut in yields is forecast for corn, as the consequences of inadequate input application could be greater than for other crops. Corn production is projected at 19.5 million tons, less than half of a year ago, and 42 percent below the recent 5-year average. A smaller production reduction is projected for barley, with output at 6.0 million tons, 40 percent down on the year and about 31 percent below the 5-year average. The projections for Ukrainian production of wheat and oilseeds are reduced less, see figure B below.

Figure B  
**Ukraine: 2022/23 projected output for major crops**



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

**China** is the largest coarse grain and corn producer after the United States, with 2022/23 coarse grain production projected to reach 279.3 million tons, 1.6 million tons down on the year. Corn dominates total coarse grain production, with expected production of 271 million tons down 1.6 million tons—with a less than 1-percent decrease in corn area, down 0.3 million hectares. The modest reduction in corn area follows an increase in soybean planting (supported by Government subsidies) and includes intercropping planting of soy and corn.

The most dynamic and fast-growing corn-producing region in the world is in **South America**, with three major producers—Brazil, Argentina, and Paraguay. In 2022/23, the region is forecast to produce 193.2 million tons of corn, up 13 million tons from 2021/22. **Brazil** is expected to increase corn area further to record highs, while for **Argentina** and **Paraguay** corn area are projected unchanged.

A return to trend yields and continued expansion in second crop area takes Brazilian corn production up by 10 million tons to 126 million. Argentine corn output is projected 2.0 million tons higher to reach 55 million, while Paraguay is forecast to produce 0.8 million tons more corn. Brazilian farmers are expected to continue to expand area of their low-cost second-crop (safrinha), as well as the third-crop corn, using the large pool of land available for double cropping with soybeans in the Center-West. The first-crop corn area, currently about one-fifth of total planted area (and in decline for more than 30 years since its peak in 1986/87), appears to have reached its lowest point in 2018/19. The corn area is projected to grow slightly in 2022/23, adding to a 4.1 percent projected increase in total area in Brazil to reach 22.7 million hectares.

The **European Union (EU)** is forecast to produce 2.5 million tons less coarse grain to reach 151.6 million in 2022/23. EU corn production is forecast down 3.2 percent from 2021/22 to 68.3 million tons, driven by a decrease in corn area and lower yield. Area is projected lower as relative prices and smaller input requirements favor barley, sunflowerseed, and soybeans for area planted. Projected corn yields are also trimmed, with a return to trend in the countries that enjoyed above-average weather conditions in 2021/22 (such as **France** and **Romania**). A decline in corn is partly offset by higher barley production, with an expected increase in area. The **United Kingdom** (a former member of the EU and a major barley producer) is projected to reduce barley area and production.

Coarse grain production in 2022/23 for **Sub-Saharan Africa** is forecast 1.6 million tons higher to 128.9 million, with higher sorghum and millet, but lower corn output. With higher projected area and a trend yield—the largest corn producer, **South Africa**, is expected to produce 1 million tons of corn more than last year—harvesting a crop of 17.3 million tons. A drought is expected to cut yields in Malawi and Zambia, while higher yields and production are projected for Ethiopia and several other countries in the region.

In **India** (where most coarse grains bar corn are used for food), year-over-year production is virtually unchanged at 50.1 million tons in 2022/23—with higher barley, but lower corn and sorghum area and trend yields. The 2021 monsoon rains were beneficial for last year's summer

crops, while the 2022 monsoon (expected to begin in September) will be critical for the current production forecasts.

**Canada** is projected to produce 29.8 million tons of coarse grain in 2022/23, up 5.6 million from last year, bouncing back from a major drought in the Prairies that cut yields. Planting intentions reported by Statistics Canada (the official Government reporting agency) indicate similar coarse grain area, with increased area for oats and lower for barley. Corn area is projected slightly (a fraction of a percent) higher. Projected trend yields boost Canadian barley output by 3.5 million tons, oats are projected up 2 million tons, while corn is unchanged from last year.

**Middle East** coarse grain production is forecast up 2.5 million tons in 2020/21 to 20.6 million, with a 35-percent increase in barley output that is partly offset by a reduction in corn. With higher projected barley area (a shift away from wheat) and a rebound in yields, Turkey is projected to produce 7 million tons, or 56 percent more barley than last year—while corn output is projected down almost 8 percent. Higher barley area and yields are projected for Syria, while Iran is expected to have higher barley output with unchanged area.

**North Africa's** 2022/23 coarse grain crop is projected at 11.6 million tons, 1.2 million below last year. A winter drought has devastated western Morocco, with the barley crop forecast 2 million tons (or 72 percent) lower than last year to just 0.8 million, getting close to the disastrous harvest of 2020. Both Algeria and Tunisia have received favorable rains, with barley output in Algeria rebounding from last year's low harvest. Coarse grain production in Egypt is mostly irrigated corn, with relatively stable production prospects at 7.4 million tons.

**Russia** is projected to produce 42 million tons of coarse grain in 2020/21, up 3.4 million. Unlike Ukraine, Russia is not expected to suffer war-related losses in crop area and yield. On the contrary, it is one of the few countries in the world not expected to experience any shortages of fertilizer, fuel, and/or other inputs, being a major producer of those inputs. Russia is even able to limit input prices and exports, thanks to the powers the authoritarian state has to jawbone producers. Corn area is forecast to be unchanged, as expected returns are currently better for barley and oats. Yields are projected at trend level and support a crop of 15.5 million tons. Area for barley and oats is projected higher, with a shift away from wheat and rye. Together with a return to trend yields, production for both crops is projected at 19.5 and 4.5 million tons, or 11 and 21 percent higher than a year ago.

## Changes in the 2021/22 Global Corn Production Forecast

Global coarse grain production for the current year 2021/22 is forecast at 1,501.4 million tons, virtually unchanged with a number of offsetting changes.

The *USDA Interagency Commodity Estimates Committee* reviews **Sub-Saharan Africa's (SSA)** production projections and prior year estimates twice a year, and this month included such a review. Coarse grain production for 2021/22 is estimated 2.9 million tons lower to 127.3 million, with multiple changes across the region and grains. The largest 2021/22 coarse grain production changes are for Niger coarse grain (sorghum and millet), down 2.4 million tons—and for Sudan sorghum, down 1.5 million tons. Multiple smaller partly offsetting changes are also made to 2021/22 coarse grain prospects in the region.

The offsetting increases include Argentine barley—and Egyptian, Burmese, and Vietnamese corn. For **Argentina**, barley production for 2021/22 is estimated 0.5 million tons higher from last month. The crop has been harvested, but the estimates for the country's barley area and yield keep increasing. Argentine barley is highly concentrated in the province of Buenos Aires that was not affected by the drought. For Egypt, Burma, and Vietnam—corn area was revised up for 3 consecutive years, resulting in higher projected output.

While 2021/22 harvests in the Northern Hemisphere were generally completed between August and December 2021, important Southern Hemisphere crops are still growing. **Brazil's** 2021/22 second-crop (safrinha) corn is currently going through key reproductive stages, April being a critical month for development of the safrinha crop. In 2022, April was unseasonably dry, with the rainy season ending earlier than expected in the Center-West, particularly in the states of Mato Grosso and Goias that produce about half of the second-crop corn. The forecast for the average corn yield is reduced 3.1 percent to 5.3 tons per hectare. However, reported corn area keeps increasing and is currently projected at 21.8 million hectares (or 3.3 percent higher from last month). Consequently, Brazilian corn production for 2021/22 is left unchanged at 116 million tons.

## World Corn Use and Stocks in 2022/23 Projected Lower

An almost 5-percent decline in U.S. feed and residual use drives global corn consumption lower. Foreign corn feed use is projected less than 1 percent higher than last year—from higher projected use in **China**, **Brazil**, and **India**—which are offset by reductions taken for **Ukraine**, **Canada**, and the **European Union**.



**China**, the largest coarse grain feeder in the world, is expected to feed an additional 4 million tons of coarse grains (5.0 million tons more of corn, though 1 million tons less of sorghum). The increased demand for feed is at least partially attributed to China's reportedly recovering swine herd. A decline in domestic consumption of grain in **Ukraine** comes from a very high base of 2021/22 when the country could not export much of its already harvested grain because of the continuing Russian blockade of its seaports. In 2022/23, total supply of grain in Ukraine is projected substantially lower—16.7 million tons relative to a year ago—hence the expected unexported surplus will likely be smaller. Changes for coarse grain consumption for other countries follow 2022/23 supplies and relative prices for feeding different types of grain.

Foreign food and industrial use (FSI) of coarse grains is forecast to grow by 5.1 million tons in 2022/23, to 381.8 million tons. In a number of countries, higher FSI is supported by increased production prospects. Out of that, an increase in the FSI for **Sub-Saharan Africa** is 3.6 million tons to reach 111.1 million, mainly for sorghum and millet. Countries such as **Niger**, **Sudan**, **Burkina Faso**, and **Nigeria** (among several others) are expected to boost their coarse grain use. Most of the Sub-Saharan increase is for direct human consumption, with feed use remaining flat at 18.8 million tons.

With coarse grain production forecast to be lower than consumption, projected world ending stocks for 2022/23 are down 4.1 million tons from a year earlier to 330.3 million, with a major reduction coming from corn and a little bit from sorghum. Oats and barley stocks are forecast higher. Corn stocks are projected to decline over the year by 4.3 million tons. With a 1.7-million-ton decline in U.S coarse grain stocks, foreign stocks are projected down by 2.4 million.

A decline in foreign corn stocks is driven mainly by **China**, where a drop of almost 3 percent, or 6 million tons, is projected. China's share in world corn stocks is still hovering around 67 percent. China's share in world stocks continues to be much higher than its share in global corn output (about triple). Leaving out the reduction in China's stocks, all other foreign coarse grain stocks for 2022/23 are actually projected to be slightly higher over the year. Higher corn stocks are projected in Brazil, Canada, Serbia, and Ukraine. These increases are partly offset by lower stocks in India, Morocco, and several other countries.

### **Projections of Domestic Use and Stocks in Ukraine**

As grain exports declined sharply in Ukraine, the country was left with large grain surpluses, boosting its feed and residual use and stocks. Without any additional knowledge about the level of destruction of elevators and corn supplies in Ukraine, the assumption we have been using so far is applied again. Roughly half of the surplus grain is projected not to be exported at any time

in the future, as some supplies are either destroyed or have become unfit to use, increasing the residual part of the feed. The rest of this corn is projected to be stocked and probably exported or used domestically in the future.

## Ukraine Drives Global Coarse Grain Trade Down

World coarse grain exports in 2022/23 (October-September international trade year) are forecast to contract sharply, falling 8.9 million tons or 3.7 percent to 228.6 million, from the estimated exports of 2021/22. This decline is a reversal of the situation observed in 2021/22, when record-high corn and sorghum (as well as near-record-high barley) exports boosted trade in coarse grains to a record-high volume.

**Ukrainian** export projections drive the decline in global trade, with a 15.1-million reduction in the country's coarse grain exports. However, part of this shortfall is forecast to be partly offset by higher projected exports by a number of countries. For the world excluding Ukraine, coarse grain exports are actually forecast about 7 million tons higher—boosted by **Brazil**, **Canada**, **Paraguay**, and **Russia**—with partly offsetting changes for the **United States**, **Australia**, and **Argentina** (among others).

Global **corn** trade is projected to retreat to the level achieved 2 years ago at 183.2 million tons, down 7.3 million from 2021/22. Global trade in **barley** for the international trade year is forecast to decrease slightly to 31.1 million tons, down 0.3 million from estimated exports in 2021/22—while trade in **sorghum** is projected 1.6 million tons lower at 11.1 million tons.

Since the Russian military invasion in **Ukraine** has disrupted trade flows, global corn and barley trade (along with wheat) has become yet another casualty of the aggression. As already mentioned above, Ukrainian coarse grain exports are forecast to decline 15 million tons from last year, or by almost 60 percent from the already downwardly adjusted exports for 2021/22, now projected at 23 million tons. Note that the pre-war (February 2022) corn export projection for Ukraine for 2021/22 stood at 33.5 million tons and was subsequently reduced to 23.0 million. This drastic decline takes the world more than 10 years back, before Ukraine became a corn export powerhouse. In the last 5 years, Ukraine accounted for an annual average of about 15 percent of global corn exports. Assuming normal weather, the existing yield trend (and the fact that the country is strongly export-oriented), Ukraine could be expected to export somewhere in the range of 30-plus million tons of corn in 2022/23. Instead, Ukrainian corn exports for 2022/23 are currently forecast at just 9.0 million tons, down 14 million on the year and less than a third of the country's potential before the conflict. Projections for Ukrainian barley exports also

underwent major reductions this month. For the current year of 2021/22, barley exports are cut 3 million tons to 2.8 million. For the next 2022/23 trade year, barley exports are projected at 2 million tons, less than half of typical Ukrainian exports during the last several years.

Large volumes of grain surplus have been trapped in Ukraine that have been export-oriented and lack sufficient storage facilities, while its exports opportunities are limited by the continuing Russian blockade of the country's seaports. Ukraine is attempting to expand export routes—using rail transportation, trucks and ports of its neighboring countries—but so far, logistical difficulties prevail (including incompatible rail gauge standards between Ukraine and its western neighbors). As of April 2022, monthly Ukrainian grain exports are hovering at around 1.3 million tons, compared to about 6 million tons that used to be shipped out of the country per month before the war.

**Russia's** grain exports are not expected to be negatively affected by its invasion into Ukraine, and its barley exports are raised 1.5 million tons to 6 million. There are reports of Russian stealing and smuggling of grain (wheat and barley) from the Ukrainian southeastern growing areas, trucking grain to the annexed Crimea and shipping it out of the port of Sebastopol. This port normally handles very little grain trade, but according to the reports, there was a sharp increase in recent exports from Sebastopol in both March and April.

**Brazil** is well positioned to partly fill the gap opened by the Ukrainian export cuts. However, heat and dryness lowered Brazil's 2021/22 second-crop corn prospects, boosting corn prices further. This is the second year in a row of unfavorable dry weather in the Center-West in April during the crop reproductive period. However, area expansion in the Center-West offset the corn yield reduction. For the 2022/23 October-September trade year, Brazilian exports are forecast to expand sharply to a record-high of 46.5 million tons, making Brazil the world's second-largest corn exporter, with a 25-percent share of world trade.

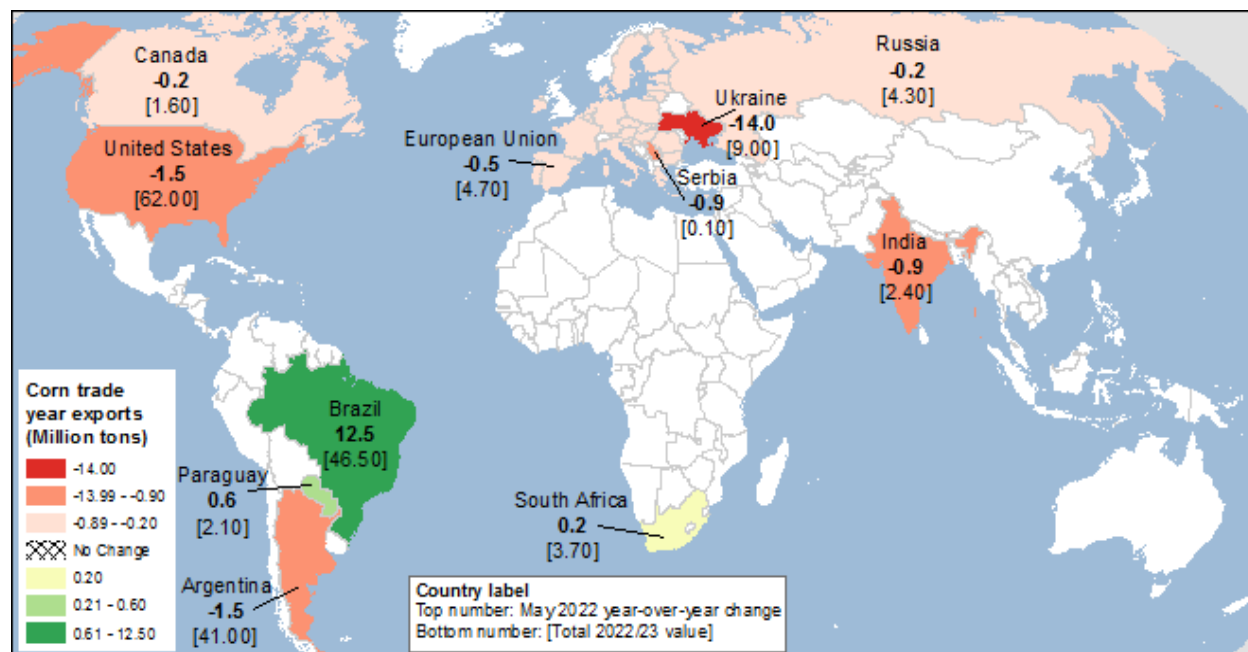
**Argentina**, with a large crop every year since 2018/19, is projected to be the third-largest exporter of corn, with a 22-percent share in global corn trade. Argentina is projected to export 41 million tons in 2022/23, 2 million tons higher year over year for the March-February local marketing year, but 1 million tons lower for the October-September trade year. This increase is a reflection of the unusually high pace of exports in the second part of the 2021/22 trade year.

**U.S.** corn exports in 2022/23 (October-September TY) are projected to reach 62.0 million tons, down 1.5 million from the current 2021/22 projection of 63 million tons, still the 4th highest corn exports on record. Lower projected corn output, from a decrease in intended planted corn area and slow planting progress (see the domestic section of the report) and robust domestic

demand, are limiting exportable U.S. supplies of corn. However, a virtual absence of competition from Ukraine, whose exports are expected to drop by 9 million tons in 2022/23, is expected to benefit U.S. exports. U.S. corn export prospects for 2022/23 are also expected to continue to benefit from the massive Chinese imports (though still smaller than a year before).

Map C below presents the forecast for major corn exporters and year-over-year changes in corn trade year exports.

**Map C – Major year-over-year changes in corn trade year exports for 2022/23**



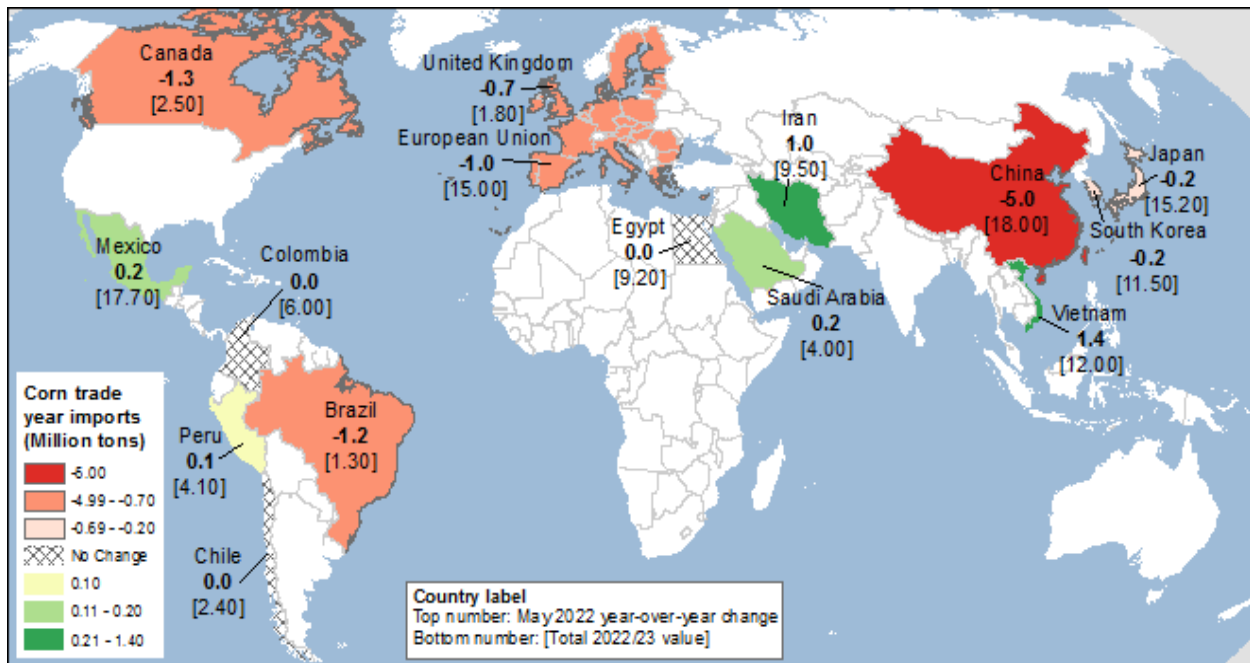
Source: USDA, Foreign Agricultural Service, *Production, Supply, and Distribution* database

In the last 2 years, **China** has become by far the largest world grain importer—with a sizeable import market share for corn, sorghum, barley, and oats. In the first part of the current 2021/22 year, global coarse grain trade was driven largely by strong demand from China to meet its domestic feed needs. However, Ukraine—together with the United States—has become China’s main source of corn imports. A drop in Ukrainian 2022/23 corn exports is expected to curtail China’s imports, with a projected reduction of 5 million tons from the already reduced projection for 2021/22. China’s barley imports are also trimmed by 1.5 million for 2021/22—while in 2022/23, the country is projected to import 1 million more, presumably from Russia. China is projected to import 1 million tons less of sorghum, due to lower supplies in the United States and Australia. Total coarse grain imports in China are projected down 5 million tons to 37.8 million, the lowest in 3 years, despite a still substantial price wedge between the country’s domestic and world prices.

Corn imports are reduced for **Brazil** and **Canada**, a return to normality after a drought-affected year. The **United Kingdom**, which sources a large share of its corn imports from Ukraine, is also projected to see a decline in corn imports.

Map D below presents the forecast for major corn exporters and year-over-year changes in corn trade year imports.

**Map D – Major year-over-year changes in corn trade year imports for 2022/23**



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

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