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Prepared By: Evgenia Ustinova

Approved By: Michael Conlon

Report Highlights:

Next season, Post forecasts corn area to expand by one million hectares (ha), to a total of 22.5 million ha, and production to top 118 million metric tons (MMT). The wheat planted area will grow to 3.4 million ha, with production reaching nearly 9 MMT. The expansion for both commodities is forecast on rising global prices and demand, spiked by the armed conflict in the Black Sea region. Although Brazilian growers have room to expand planting, the big question is whether they will have enough fertilizer to do so. A reduction in inputs would also lead to lower yields, though the impact will be uneven across the country and will depend at least to an extent on climate. Post forecasts a slight decrease in rice area and production, owing to competition with other crops and lower profitability of rice vis-a-vis other crops. Unlike with the corn and wheat trade, Post does not anticipate a big uptick in external demand for Brazilian rice next year.

PSD Corn

Corn	2020/2021		2021/2022		2022/2023	
Market Begin Year	Mar 2021		Mar 2021		Mar 2022	
Brazil	USDA Official	New Post	USDA Official	New Post	USDA Official	New Post
Area Harvested	19900	19900	20800	21500	0	22500
Beginning Stocks	5328	5328	4728	3928	5228	3928
Production	87000	87000	114000	115000	0	118000
MY Imports	2900	2900	2000	2000	0	1800
TY Imports	2281	2281	2500	2500	0	1800
TY Imp. from U.S.	1	1	0	0	0	0
Total Supply	95228	95228	120728	120928	0	123728
MY Exports	21000	21000	43000	44000	0	45000
TY Exports	27492	27492	32500	33000	0	45000
Feed and Residual	59000	60300	61500	62500	0	63500
FSI Consumption	10500	10000	11000	10500	0	11500
Total Consumption	69500	70300	72500	73000	0	75000
Ending Stocks	4728	3928	5228	3928	0	3728
Total Distribution	95228	95228	120728	120928	0	123728
Yield	4.3719	4.3719	5.4808	5.3488	0	5.2444
1000 HA, 1000 MT, MT/HA, TY: Oct-Sep						
Source: Post Brasilia						

Corn Production

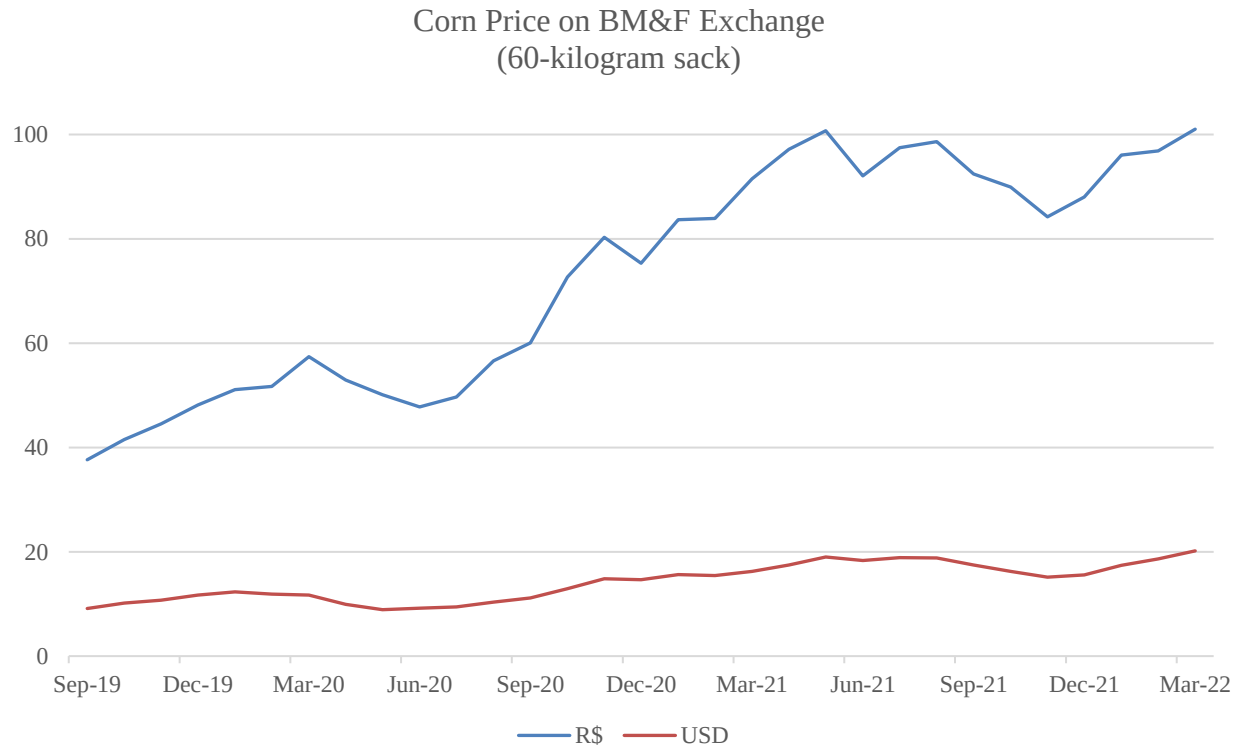
2022/23 Planting Area and Production to Expand, Pending Fertilizer Deliveries

For the 2022/23 season (March 2023 – February 2024), Post forecasts corn area to expand by one million hectares (ha), to a total of 22.5 million ha. This initial forecast represents an almost 5 percent area increase on the current season. Post expects that planted area will increase based on trendline expansion over the last several seasons when the area increased between 5 and 7 percent. In March 2022, Post spoke with interlocutors across Brazil regarding their expectations for the 2022/23 marketing year (MY); the majority of contacts were optimistic about the future for nearly every major crop sown in the country, particularly so for corn. That said, contacts also cautioned that amid armed conflict in the Black Sea, and the disruption of fertilizer imports, growers may revise their planting plans downward as they get closer to sowing.

Post sets its initial corn production forecast at 118 MMT, which would represent a 3 percent increase over Post's estimate for the current market year and set a new record in production.

Record Prices to Incentivize Expansion

Post contacts highlight that while soybeans are by far the dominant crop sown in Brazil, corn is likely to expand at a faster pace. The expansion in corn area planting will be primarily driven by the increasing profitability of the crop, as domestic and global prices are expected to continue to climb, renewing record highs. The corn index from the Center for Advanced Studies in Applied Economics (Cepea) showed the price surpassing R$101 per 60-kilogram (kg) sack of corn in March 2022, a new record for Brazil.



Data Source: University of Sao Paulo Center for Advanced Studies in Applied Economics (CEPEA), Chart Post Brasilia

Before the 2022 record price, Brazil saw prices hit at just R$100 level in May 2021; at that time, however, the record-setting 2020/21 safrinha corn crop hopes were dashed by inclement weather. Brazil's 2020/21 corn crop ended the season at just 87 MMT, almost 20 MMT below what the market had anticipated at the start of the season. The current 2021/22 crop is performing much better and market surveys indicate that Brazil will likely have a record amount of corn by July 2022.

In an average harvest season, corn prices in Brazil generally fall as harvest peaks during the June-July timeframe and new supply comes on the market. Post anticipates that this year, however, corn prices will continue to climb in the coming months, tracing the global price spike. According to the International Grains Council, corn prices for major exporters are hitting historical records. The current price trend is associated with the ongoing military action in Ukraine that has disrupted port operations

and commercial activity in the Black Sea, sharply increasing uncertainty in the global corn market. Ukraine generally accounts for about 15 percent of the global corn export market.

Fertilizer and Input Availability to Impact Planted Area

Brazil is the third-largest corn producer and exporter in the world. Brazilian growers have plenty of readily available fields that may be converted to corn production next season. However, the Post forecast remains at trendline expansion, despite the availability of land and the current global corn trade and price environment. The Post 2022/23 forecast assumes that Brazilian growers will be constrained by the high price point and supply availability of fertilizer. As one of the main commercial crops, corn consumes 17 percent of the total fertilizer used by growers in Brazil. Meanwhile, Brazil is the top global importer of fertilizers, with 85 percent of all agricultural nutrients sourced overseas. Although Brazil has developed a National Fertilizer Plan to lower its dependence on imported supplies, Post anticipates that over the next several seasons its needs for imported materials will remain very high. (For more details see GAIN Report: Brazil Agriculture Seeks Remedies for Potential Fertilizer Disruptions).

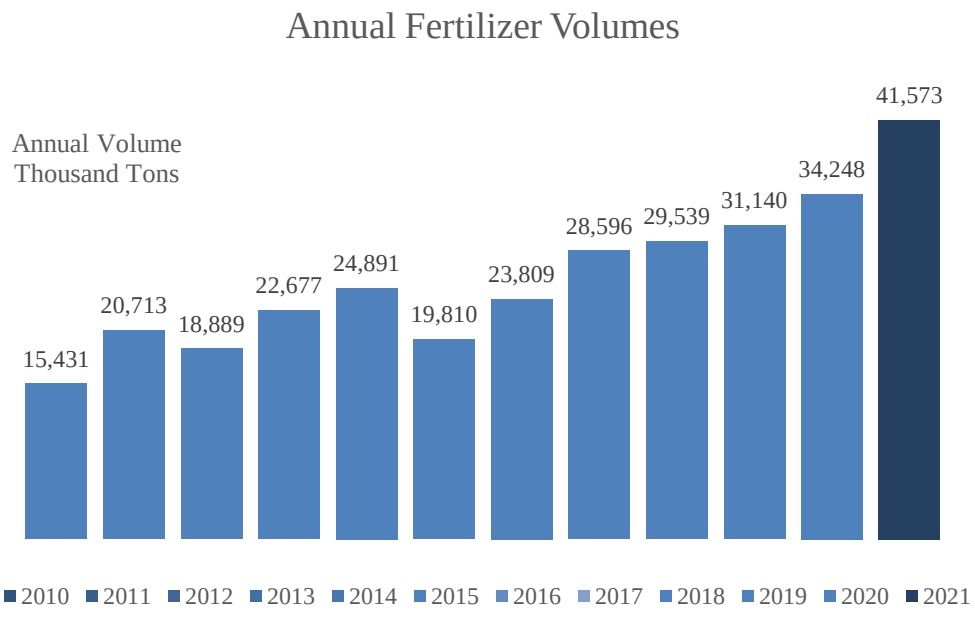
Source: Comexstat, Chart Post Brasilia

Brazil's top suppliers of fertilizer include Russia, Canada, China, Morocco, the United States, and Belarus. In recent years, Russian fertilizers (mostly ammonium nitrates and potash) accounted for over 20 percent of Brazil's fertilizer imports. Due to the conflict in Ukraine, the market assumes that the flow of Russian fertilizers will slow substantially, if not stop, over this year and next. Although Russian ports

are not seeing military action, international maritime insurance companies have largely steered clear of providing coverage for vessels carrying cargo from the region. In addition, the sanctions on individual company owners, banks, and the prohibition on SWIFT transactions have made sales contracts exponentially more difficult, though not impossible.

Agricultural Minister Tereza Cristina has asserted that Brazil will not be able to purchase Russian fertilizer while the war is going on. Instead, the Brazilian government officials have sought to strike deals with major fertilizer exporters from Canada to the Middle East and North Africa to plug the expected shortfall. However, the market anticipates that some fertilizer shortage is inevitable, the only question is how large the gap will be.

In early March, Brazil's National Association for Fertilizer Dissemination (ANDA) assessed that the country has enough fertilizer to last the next three months. According to ANDA, the current volumes stand at above-average levels recorded in previous years. The Foreign Trade Secretariat (SECEX) data shows that Brazil indeed imported 41.6 MMT of fertilizer in 2021, an unusually large increase of almost 40 percent on last year's imports. CONAB had previously estimated fertilizer imports at 35 MMT for 2021. The increase in purchases happened at the tail end of 2021, as global prices began to rise in the anticipation of possible delivery disruptions. In a separate statement, Agricultural Minister Tereza Cristina suggested that Brazil has enough fertilizer to last twice as long, or six months. Post contacts indicate that the difference between the two assessments likely stems from the amount of fertilizer in stocks, versus purchased and scheduled for delivery.



Source: SECEX, Chart Post Brasilia

Post interlocutors indicate that input contracts for the main 2022/23 crops lag far behind the normal pace. Growers generally conclude contracts with Brazilian input distributors for the next season as they harvest their current crop. Deliveries then take place in the ensuing months, though most farmers prefer

to receive their chemicals close to the start of planting. In Brazil, few growers have storage facilities available, and most choose not to keep valuable inputs sitting in plain sight as the risk of robberies is real and persistent. It is difficult to ascertain the exact level of current purchases, as farms generally do not disclose their data publicly. Post contacts indicate that growers who will begin planting corn in September 2022 may have purchased about 60 percent of their fertilizer needs when normally the contracts would be done by now. Meanwhile, for growers who will only plant at the end of 2022 and early 2023, contracts may be less than 30 percent complete, when normally growers would have already concluded 50-60 percent of their purchases.

While the shortage of supply is the main concern in the market, the extremely high level of input prices may lead some farmers to scale back their purchases as well. As of March 25, agricultural consultancy StoneX estimated that a grower needed to sell 25 60-kg bags of soybeans to buy a ton of potash, up from 20 bags in mid-February. Prices for the nitrogen-based fertilizer urea are up even more, equitable to 45 bags of soybeans, up from 30 bags a month earlier. Post contacts indicate that many growers are not willing to purchase at the current rates. A lot of the farmers who have yet to secure their supplies are adopting a wait-and-see approach, hoping that disruptions to the fertilizer deliveries will subside and prices will come down. The key date to watch is June 2022; as Brazil imports a large portion of its fertilizers from Russia and Belarus, companies importing the supply from this region will need to make a firm decision by early June. Generally, it takes vessels from Russia about 6 – 9 weeks to reach Brazil. Growers will need to have their supply on hand in August to begin preparing the soil for planting first season corn.

Corn Yields Are Likely to Be Lower in the Event of a Fertilizer Shortfall

Brazil's National Agricultural Research Institution, Embrapa, estimates that Brazilian farmers may be able to reduce fertilizer application by up to 20 percent without a significant negative impact on yields. Embrapa is planning to set up extension seminars across the country teaching farmers how to increase efficiency and precision in fertilizer application. Post contacts indicate that the 20 percent reduction estimate is probably much too optimistic, with estimates of reasonable reduction that would not have a notable adverse impact on productivity ranging from 8 to 15 percent.

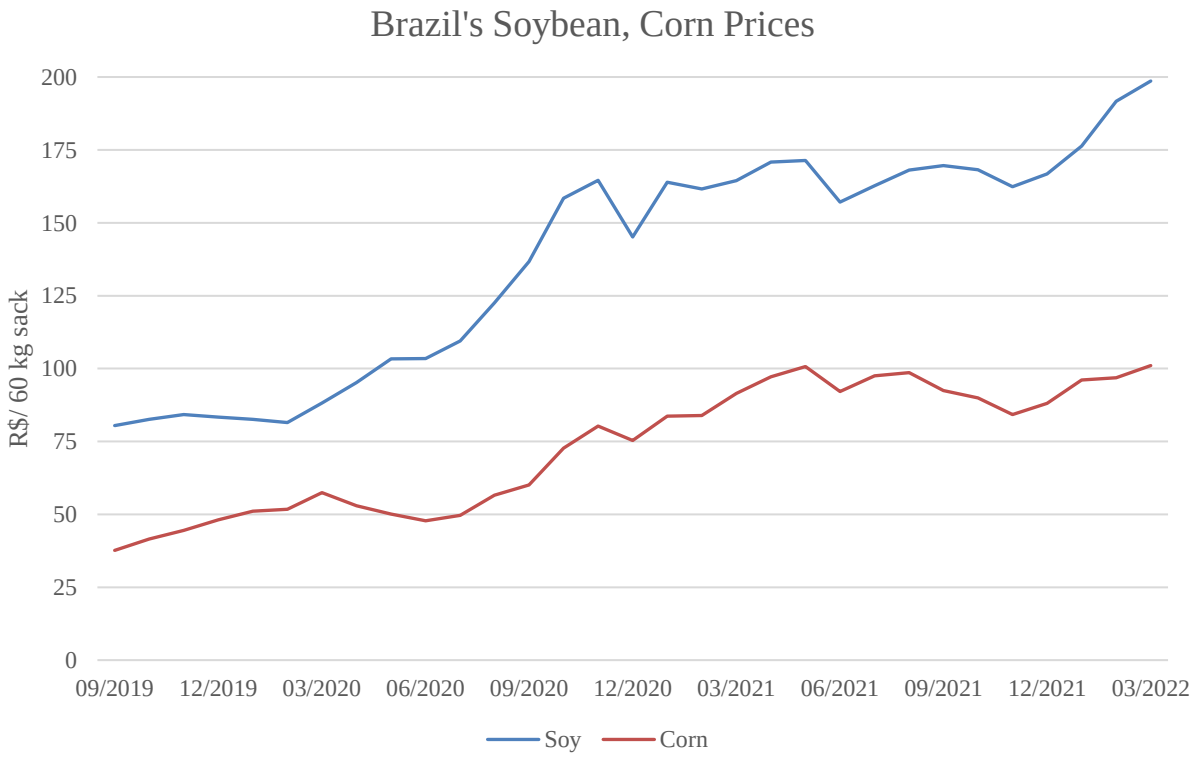
Given Brazil's geographic size and diversity, as well as the varying levels of farmers' capitalization, in the scenario of the overall reduction in fertilizer supplies in the country, the impact on crop yields will be uneven. Generally, the southern portions of the country have more fertile soils that require less fertilizer. The center-west cerrado region has poor natural soil fertility and requires more upkeep. At the same time, those farm operations that have invested properly in soil management over the last five years, regardless of their geographic location, are likely to be able to withstand reduced application and still see adequate yields. Notably, these farmers are also the most likely ones to have the investments necessary to purchase more fertilizers in an environment of extremely high prices.

Since corn is produced across nearly every state in Brazil over three different harvests, the impact of fertilizer reduction will also depend on the timing of each planting. Traditionally, corn was a staple crop in southern Brazil, cultivated to support the livestock and poultry sectors concentrated in that region. Today, first season corn is planted in the south, as well as the southeast and northeast regions of Brazil between August and January, with harvest taking place from January to May. This crop is now known as "full season" or summer corn since it is normally the only crop planted during the year and is also

largely cultivated during the Southern Hemisphere's summer season. CONAB data shows that first season corn has the highest yields, with an average of 5.73 mt/ ha over the last five years.

Post contacts report varying estimates of fertilizer purchases for first season corn, ranging from 30 to 60 percent. It is unclear just how much of that volume has been delivered. Post interlocutors have indicated that growers in the South may be able to take advantage of the fertilizers remaining in the soil after the disastrous first season soybean and corn harvest of 2021/22. As large swathes of crop fields suffered from inclement weather on the account of La Nina and failed to properly germinate or develop, the plants never used up the fertilizer that was put into the soil last year. In addition, the Southern region of Brazil boasts the most fertile soils in the country, and therefore the average yield for the region should be able to withstand somewhat reduced fertilization.

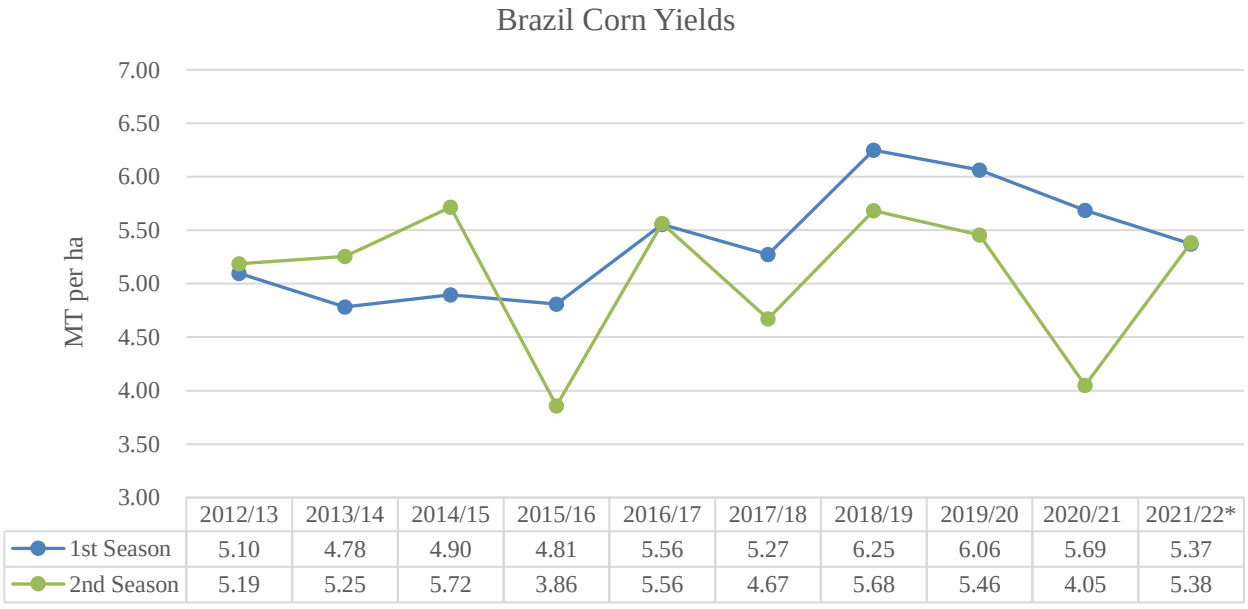
First-crop corn accounts for only a quarter of Brazil's total production. The fate of Brazil's 2022/23 corn crop will depend on the second-season corn, which is planted from the South to the West and the North between late December and March. Originally known as the "safrinha," or "little harvest," in Portuguese, Brazil's safrinha corn makes up almost 75 percent of total production in the country. CONAB data shows that safrinha corn yields averaged 5.05 MT/ ha in the last five years. Safrinha corn yields are typically lower than that of first season corn, for several reasons. First, farmers sow safrinha corn following the first-season soybean harvest. If soybean harvest runs late, as happened during the 2020/21 season, then corn is planted outside of the ideal planting window and is subject to a much greater risk of inclement weather. Second, much of the safrinha corn is planted in the less fertile cerrado region of Brazil, where growers must invest more in soil management to bring up their yields. As soybeans bring in higher prices, growers typically prioritize input applications for this crop. At the same time, as corn prices have been rising steadily over the last several years, farmers are incentivized to ensure proper nutrition for their second season as well.



Data Source: University of Sao Paulo Center for Advanced Studies in Applied Economics (CEPEA). Soybean price reflects the Parana index. Corn price is the general BM&FBOVESPA index. Chart Post Brasilia.

In a scenario where the Brazilian growers might not be able to source optimal fertilizer supply for summer soybeans and winter corn, they are more likely to prioritize application for the first season soybeans. In Brazil, soybeans are regarded as the most liquid and profitable crop, with ample global demand and high prices. Though corn profitability has improved over the last several seasons, most growers still depend on soybeans as their primary cash crop; currently, soybean prices are nearly twice as high as corn prices. Typically, Brazilian growers conclude soybean sales contracts several months in advance of sowing and use the advance to purchase fertilizer and inputs for both first and second season harvests. Therefore, growers depend to a greater degree on profits from soybeans than corn. In addition, since safrinha corn is sown after soybeans, farmers may decide on a "hail mary" approach, going all-in on fertilizer application for the first crop and hoping that additional fertilizers may materialize in a few months in time for corn planting.

For the 2022/23 corn crop, the initial Post yield forecast is 5.24 mt/ha; over the last five years, yields varied by as much as 1.5 mt/ ha between seasons, oscillating between 4.37-5.77 mt/ha. Despite this notable variation, Brazil's corn yields have registered trendline improvement over the last decade owing in large part to cutting-edge technology, such as Genetically Engineered (GE) seeds and the use of chemicals and fertilizers. Investment in inputs has alleviated some of the variability brought by climatic conditions around the country. However, as the chart below shows, even with optimal use of technology, yields vary in any given year depending on weahter. Post forecast for the coming season will be adjusted on both fertilizer use and climate conditions.

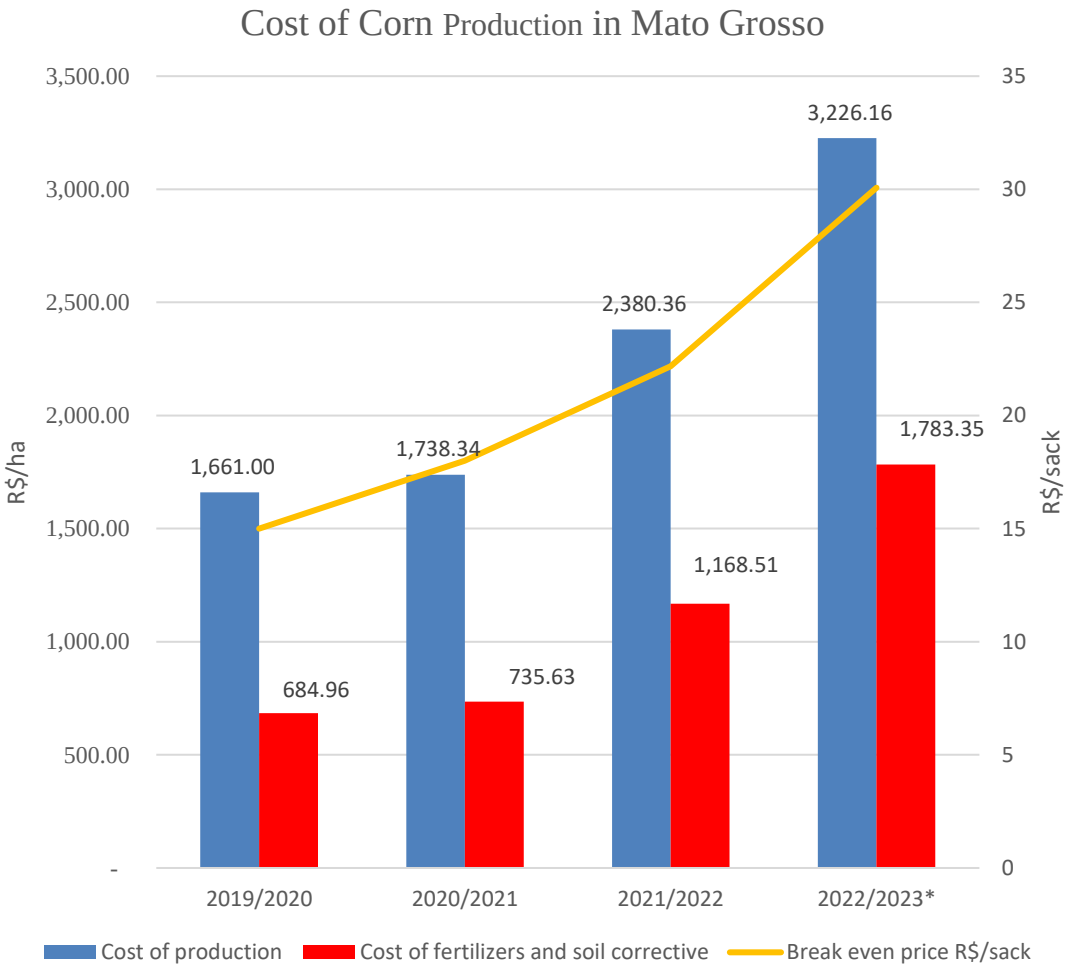


	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22*
1st Season	5.10	4.78	4.90	4.81	5.56	5.27	6.25	6.06	5.69	5.37
2nd Season	5.19	5.25	5.72	3.86	5.56	4.67	5.68	5.46	4.05	5.38

Data Source: CONAB with 2021/22 representing March 2022 estimate; chart Post Brasilia

Cost of Production, Exchange Rate, Elections Important Secondary Factors

Although the availability of fertilizer is currently the primary risk factor that may negatively impact planted area for the 2022/23 season, the overall increase in the cost of production may also act as a deterrent to expansion. According to the Mato Grosso Institute of Agricultural Economics (IMEA), the cost of production for the 2022/23 season will rise by over 35 percent from the current season, mostly driven by the increase in fertilizer, which rose by over 50 percent for corn so far this season. As the chart below shows, the breakeven point for the 2022/23 corn harvest has also risen. At the same time, IMEA currently projects a breakeven price of R$ 30/ sack, which is significantly below the farm gate prices of R$100 per sack. As such, Post anticipates that the domestic corn prices will continue to couch this risk and incentivize Brazilian producers to procure and use fertilizer for their 2022/23 corn crop.



Data and Chart Source from IMEA, replicated in English by Post Brasilia

The cost of production may vary for the 2022/23 season depending not only on global fertilizer and input prices but also on Brazil's currency exchange rate. Amid the onset of instability in the Black Sea region and the investors' flight from the region's emerging markets, as well as expectations of domestic inflation and monetary tightening, the Brazilian currency is hovering at two-year highs. On March 28

the real extended its year-to-date rise to more than 18 percent, rising to R$4.75 to USD, from R$5.08 to USD on February 23. If the real continues to strengthen, Brazilian growers will be in a better position to secure inputs, which are priced in dollars, in the coming months. However, the Brazilian market continues to forecast the exchange rate at well above R$5 to the USD. The Central Bank's March 25 Focus Survey of leading economists across Brazil puts the 2022 average estimate at R$5.25 to the USD, and at R$5.20 to the USD in 2023.

The Brazilian market expects the exchange rate to go up likely in part due to the ongoing volatility and disruption of the global commodity trade. In addition, the Brazilian presidential campaign has already kicked into high gear, with voters expected to cast their ballots on October 2, 2022. Traditionally, the exchange rate has been volatile in the run-up to the contest, with steep changes on the account of every new favorability poll for the leading candidates.

2021/22 Corn to Set a Record on a Bumper Safrinha Crop

Post slightly revised its forecast for corn planted area for 2021/22 MY (March 2022 – February 2023) to 21.5 million ha, which represents an expansion of 5.5 percent on the previous season. The revision accounts for the somewhat disappointing first-crop corn harvest, which has amplified the already high corn prices and incentivized producers to sow a larger area during the second-crop, or safrinha harvest. Post anticipates that the small third season corn harvest will also see expansion on the account of high corn prices. Post estimates first season harvest at 23 MMT, second season corn at 90 MMT, and third season corn at 2 MMT, for an overall volume of 115 MMT.

First Season Corn

Initial expectations for a sizeable first-season corn crop on the order of 30 MMT were dashed by the La Nina weather phenomenon plaguing southern Brazil. Due to the prolonged periods of drought in November and December 2021, which occurred right as corn crops in the south of the country were pollinating and filling grain, Post estimates first season corn to total around 23 MMT in 2021/22.

Brazil's southernmost state of Rio Grande do Sul is typically the largest producer of first-crop corn, responsible for more than one-fifth of the country's total corn output. However, this season, according to the Rio Grande do Sul Extension Service (EMATER/RS), growers in the north, center, and west parts of the state saw very poor yields with as much as 100 percent of the forecast production lost in some areas. Some of the producers chose not to harvest their corn due to the low quality of the crop, as their profits would not compensate for the investment in the harvest operation. By mid-March, EMATER/RS estimates that farmers in Rio Grande do Sul will harvest just over 801,000 ha of first season corn in 2021/22, with the final production of 2.75 MMT - down more than 55 percent from the initial expectations.

Growers in the southern states of Parana grappled with similar drought conditions, with state officials estimating losses on the order of 40 percent. With about 80 percent of the first season corn harvested by March 21, the Department of Rural Economics (DERAL) reported the first-season corn area harvested at just over 434,000 ha, with a production forecast at just 2.4 MMT of corn, down from the initially expected 4 MMT. For the small southern state of Santa Catarina – situated between Rio Grande do Sul and Parana states – the Agricultural Research and Rural Extension Company of Santa Catarina (EPAGRI) estimates corn harvest at 1.76 MMT or about one third from the initial estimate.

The impact of La Nina weather has been much more limited for corn growers in other parts of the country, and yield forecasts for these regions are optimistic. Although the south region of Brazil remains in the lead with corn area harvested this season, the southeast region is expected to emerge as the top producer of first season corn volume-wise. Brazil's agricultural statistics agency, the National Supply Company (CONAB) estimates that the southeast state of Minas Gerais will become the top producer of first crop corn in 2021/22, with 820 thousand ha of planted area and over 5.4 MMT in production. Overall, producers in the southeast region are forecast to harvest 7.2 MMT of first-season corn. In the northeast states of Maranhao, Piaui, and Bahia weather predictions augur better-than-average yields, with the region expected to harvest 5.8 MMT of first season corn.

Second Season Corn

The Center-West state of Mato Grosso is Brazil's largest corn producer overall, and is responsible for almost half of total safrinha production. According to the Mato Grosso Institute of Agricultural Economics (IMEA), by March 21, growers had planted over 99 percent of their safrinha corn crop. Growers in this part of the country typically plant safrinha corn after the soybean harvest. This season, growers managed to plant the majority of the corn within the ideal window. However, there is some concern that the La Nina weather pattern will affect the central part of the country in April and May, with drier than normal conditions. Corn crops will need rain for maximum yields. IMEA estimates that growers continued to increase their corn planted area to 6.3 million ha, up from the initially expected 6.2 million ha. The annual increase for the current season in planted area is almost 8 percent. Imea estimates production at 40.56 MMT for the 2021/22 harvest.

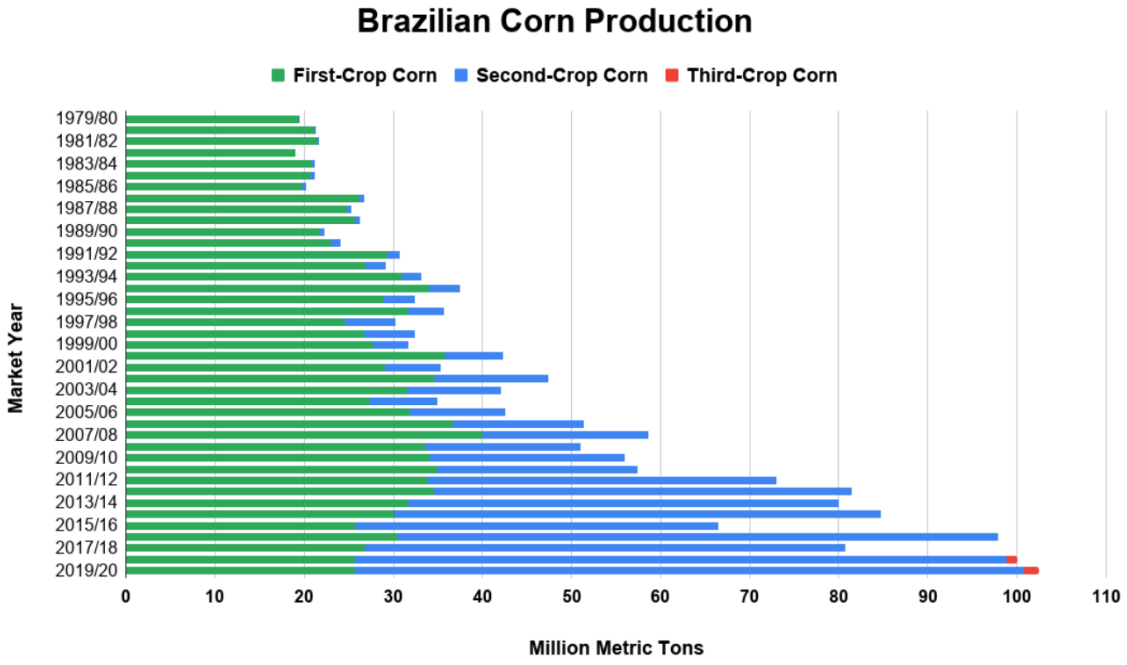
Parana is Brazil's second-largest corn-producing state, typically accounting for about 15-20 percent of the national harvest. Roughly 75-80 percent of the southern state's corn comes from the safrinha crop since a majority of producers prefer to plant soybeans first. According to the DERAL, the state's safrinha corn crop was 94 percent planted as of March 24. Despite concerns about dryness affecting second-crop corn development in the state, producers are expected to expand the area by about 5 percent in response to high prices, planting 2.63 million ha. DERAL forecasts safrinha corn harvest at 15.5 MMT.

Farmers in the Mato Grosso do Sul state had planted 82 percent of their safrinha area by March 25. The Agriculture and Livestock Federation of Mato Grosso do Sul (FAMASUL), estimates the final planted area for the state at 2 million ha, which is down 13 percent on last season. Post anticipates that planted area may be revised upwards on the account of high prices that should incentivize producers to sow additional areas. That said, parts of the state are experiencing dry conditions on the account of La Nina, which prevented some farmers from planting their corn within the ideal planting window. FAMASUL projects safrinha corn at 9.34 MMT for 2021/22.

Meanwhile, in the Center West state of Goias, the weather has been optimal, and yields are expected to reach their maximum potential. CONAB estimates Goias to produce 10.4 million tons of corn, up more than half on last season's volume. In the neighboring Minas Gerais state safrinha corn was planted during the ideal time window, and the majority of corn is rated in good condition.

Third Season Corn

In 2019, Brazil's statistics agency, CONAB defined a third corn crop in the country. This corn is grown in the Northeastern states of Sergipe, Alagoas, and the northern part of Bahia, collectively known by the acronym "Sealba." Third-crop corn is sown between May-June and harvested in October-November, a harvest cycle that more closely resembles that of the United States. This production is still relatively small and was previously folded in with the safrinha corn. Post anticipates that farmers will be incentivized to increase third-crop corn area for the 2021/22 season, and therefore production could reach 2 MMT.



Data Source: CONAB
Chart: FAS Brasilia

Corn Trade

2022/23 Corn Trade Forecast Based on Supply Assumption, but Subject to Change

Post sets the initial 2022/23 export forecast at 45 MMT, up one MMT on the current season. The forecast is based on the expectation of a new record harvest in the next season, which would make ample supply available for export. However, if production is lower than the initial expectations, then exports are likely to be lower as well, as the domestic market consumption is relatively inelastic. Post sets the initial 2022/23 import forecast at 1.8 MMT, based on the 5-year average imported volume. Import volumes are tightly linked to the production and demand of the domestic livestock industry. The majority of imports are being bought by livestock producers and feed producers in the south of the country as inputs for the poultry and swine sector located there. The import volumes are thus closely linked to the size of the first season corn crop harvested in this region.

The exchange rate will be a factor at the margins for the 2022/23 trade season. A weaker domestic currency would support stronger exports and impede imports and vice versa. Currently, Brazil's Central Bank Focus survey from March 25 anticipates that the real will trade at R$5.25 to the USD in 2022, and at R$5.20 to the USD in 2023. However, over the five weeks since the onset of conflict in the Black Sea region, the real has gained significantly and is currently trading at R$4.75 to the USD.

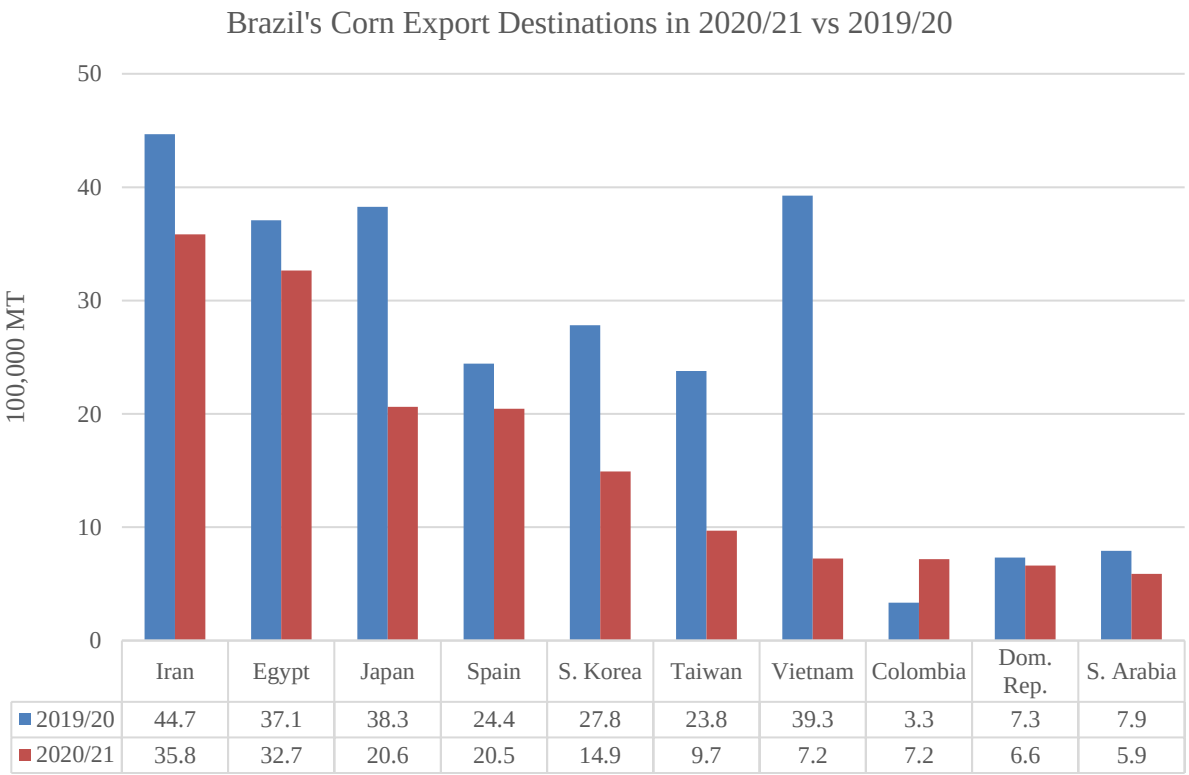
Exports to Gather Momentum in the Second Half of 2021/22

For MY 2021/22, Post revised its corn export estimate by 2 MMT to 44 MMT. The revision is based on a larger than initially expected safrinha corn harvest. The estimate does take into account the lower first season corn harvest, which normally supplies around 1.5 MMT in volumes shipped in the first four months of the MY. This season, due to the depleted domestic stocks and high demand from the poultry, livestock, and ethanol industries, very little of Brazilian corn will be available for export in the first half of the season.

The 2021/22 corn exports from Brazil will begin in earnest in June-July 2022 when the second season harvest comes online. Post anticipates that as long as the second season's production volume meets the revised expectations, Brazil will be able to meet the estimated target in the remaining months of the marketing year. The export estimate also takes into account the market expectation that the real will remain relatively weak against the U.S. dollar. As already noted, the Central Bank survey of key economists across Brazil continues to forecast the real trading at R$5 to the USD for 2022 and 2023. That said, Post contacts note that the recent strength of the real has forced continuous upward revisions in the market sentiment. A stronger real would make the Brazilian corn exports somewhat less competitive, though with the ongoing strong global demand Brazil is unlikely to struggle to market its grains.

For the current season, Post anticipates that Brazil's corn exports will be stronger than average to the Middle East and North Africa regions. In early March, Agricultural Minister Tereza Cristina met with the Ambassadors of Morocco, Qatar, Egypt, Oman, and Algeria to discuss increasing imports of fertilizer (nitrogen and phosphorous) in a barter arrangement for increased flow of Brazilian commodities to these markets. The Minister also traveled to Iran in February in a bid to secure a similar arrangement of barter exchange of the urea fertilizer for corn. Currently, Brazil imports about 26 percent of fertilizer from these countries, and the Ministry of Agriculture, Livestock, and Supply (MAPA) has signaled that it will look to the region to increase its fertilizer shipments to Brazil to meet up to 35 percent of its needs next season. In an average season with plenty of corn available for export, Iran and Egypt are already typically in the top 5 markets for Brazilian corn, while Morocco and Algeria come in at 10 and 11 respectively.

There was a sizeable shift in corn export destinations during the 2020/21 season. Typically, customers in Asia – Japan, South Korea, Taiwan, and Vietnam dominate the buyers' list for Brazilian corn. However, on the account of rising prices for Brazilian corn (due to poor second season harvest and consequent supply crunch), and higher shipping costs, exports to destinations in Asia were down by 100 percent or more. Japan dropped from its top spot to fourth place. Meanwhile, exports to buyers in Western Hemisphere were up, increasing by 70 percent to Colombia, and by 27 percent to the Dominican Republic. Post anticipates that this was a temporary disruption, with Brazil being able to regain its typical markets.



	Iran	Egypt	Japan	Spain	S. Korea	Taiwan	Vietnam	Colombia	Dom. Rep.	S. Arabia
2019/20	44.7	37.1	38.3	24.4	27.8	23.8	39.3	3.3	7.3	7.9
2020/21	35.8	32.7	20.6	20.5	14.9	9.7	7.2	7.2	6.6	5.9

Source: SECEX, Chart by Post Brasilia

Imports to Subside in 2021/22

For 2021/22 MY, Post estimates corn imports at 2 MMT. Mercosur members Argentina and Paraguay dominate import shipments to Brazil, each accounting for roughly half of the volume supplied last season. Brazil's large domestic livestock and poultry industries are concentrated in the southern states; although corn is a major crop produced in the south, the domestic production volume is not enough to supply all of their feed. Notably, while imports at 2 MMT are down substantially on the 2.9 MMT estimated in imports for the previous season, the figure is still double the 1-1.5 MMT Brazil has been sourced outside the country over the last several seasons.

This season, there was a notable shift in Brazil's corn imports among Mercosur members. Brazil typically sources most of its imports from Paraguay. However, this season with exceptionally strong production in Argentina, coupled with the depreciating Argentine peso, Brazil was able to source more than 10 times as much corn from Argentina as it did last season. For the 2021/22 season, Post anticipates that most corn imports will continue to come from the neighboring Mercosur suppliers. At the same time, Post anticipates that corn imports from the United States will be lower than the 760 MT average seen in the last two seasons. U.S. corn is sometimes sourced by the processing industry in the Northeast. However, given the ample second-season corn production and rising global corn prices, Post does not anticipate repeat orders for U.S. corn this season.

Top Suppliers of Corn to Brazil in 2019/20 and 2020/21 (in MT)

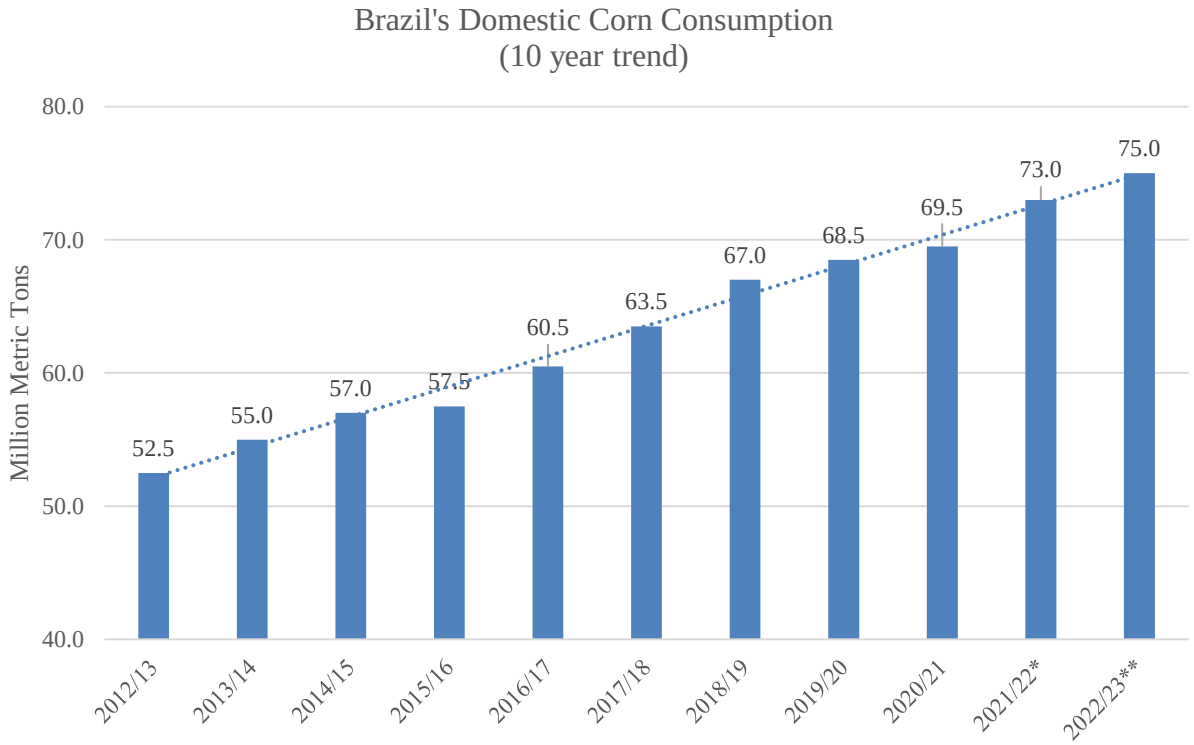
	2019/20	2020/21
Argentina	103,010	1,498,343
Paraguay	1,551,783	1,348,544
United States	772	751
Bolivia	103	51
Chile	-	13
Total	**1,655,820**	**2,847,702**

Source: SECEX

Corn Consumption

Domestic Demand to Continue Rising this Season and Next

Post sets initial 2022/23 domestic consumption at 75 MMT, which represents an almost three percent expansion on the current season estimate of 73 MMT. The forecast is in line with a five-year average annual growth. Domestic corn consumption has made steady gains in Brazil, and Post anticipates that this trend will continue.



Data Source: USDA PSD, 2021/22* and 2022/23** represent Post estimate and forecast. Chart by Post Brasilia.

Corn consumption in Brazil has nearly doubled over the last two decades, as the country became the world's largest chicken meat exporter and fourth-largest pork exporter. Brazil's large poultry and pork sectors consume the vast majority of the corn crop each year, as the grain makes up about 60 percent of feed rations. The calendar year 2021 showed strong growth of Brazil's poultry and pork production. Post estimates chicken meat production grew by over four percent in 2021, while the 2022 forecast calls for 1.7 percent growth, with production topping 14.7 MMT. Post estimates that pork meat production increased by over five percent in 2021 to 4.37 MMT, with a forecast of three percent expansion to 4.47 MMT in 2022, driven by record pork exports as well as growth in domestic demand. The Brazilian pork industry consumes about half as much feed rations as the poultry sector, but the rapid growth is still significant.

According to Brazil's National Union for the Animal Nutrition Industry (Sindiracoes), total feed production by the sector - including corn and other ingredients, but excluding mineral salt - in the calendar year 2021 grew to 81.2 MMT, an increase of just over four percent on 2020. Sindiracoes data also indicates that the production of feed rations for broiler chickens grew by 4.1 percent in 2021, while feed production for laying hens grew by 1.5 percent, and swine feed production grew by 5.9 percent. Sindiracoes projects feed production to grow between 4 and 4.5 percent in 2022 if current trade dynamics and domestic economic performance projections hold.

Post forecasts Brazil's food, seed, and industrial (FSI) consumption at 11.5 MMT up by 1 MMT on the current season estimate of 10.5 MMT. The country's small-but-expanding corn ethanol industry has grown rapidly in recent years. Currently, corn-based ethanol makes up about 10 percent of Brazil's ethanol mix. By 2030, the Brazilian industry estimates that corn is expected to make up 20 percent of the raw material mix, as Brazil pushes to meet its environmental targets.

The expansion in corn use for ethanol is forecast based on the availability of supply, especially when compared to sugarcane. Over the last several years, Brazil diverted about 45 to 55 percent of the sugar cane crop (580,000 to 670,000 MT) for ethanol production. Post anticipates that the volume of sugar cane crop earmarked for ethanol is unlikely to increase unless the RenovaBio program provides the necessary incentive for area expansion. (Please see additional information in the 2021 Brazil Biofuels Annual). Meanwhile, corn production has plenty of room to grow, providing ever-increasing supplies for the processing industry.

Post contacts indicate that corn ethanol plants in the Center West and even in the South of the country are constantly coming online. Throughout 2022 and 2023, Post anticipates that ethanol demand might receive an additional boost due to skyrocketing gasoline prices, on the account of sanctions against Russian oil.

Brazil's Corn Use for Industrial Processing (10-year trend)										
	2012	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021***
Amount of Corn used as Ethanol Feedstock, in 1,000 MT	0	0	107	291	481	990	1727	3190	5827	8129
Production of DDGs in 1,000 MT (co-product to corn ethanol)	0	0	33	91	151	310	541	998	1824	2545
Production of corn oil in 1,000 MT (co-product to corn ethanol)	0	0	2	5	9	18	31	57	105	146
Number of Corn-only or Corn-Sugar Flex Refineries	0	0	n/a	n/a	n/a	n/a	n/a	n/a	11	19
Nameplate Capacity (million liters)	0	0	0	0	0	0	0	0	2,500	4,000

Source: 2021 Brazil Biofuel GAIN Report with data available as of September 2021, 2021* is Post estimate

The Brazilian Corn Ethanol Union (UNEM) estimates that Brazilian corn ethanol production has been growing by about 800 million to 1 billion liters per year. For 2022, UNEM expects production to reach 3.34 billion liters, and climb to 3.9 billion in 2023. However, the growth potential for corn ethanol production in Brazil is still limited by regional fuel demand and the logistical challenges and profitability of transporting excess fuel to other parts of the country. Although concentrated in the Center-West region, the sector already sells corn-based ethanol to at least 10 states in Brazil's northern and northeastern regions and continues to eye expansion of distribution capabilities to the population centers along Brazil's northeastern coast.

Rice PSD

Rice, Milled	2020/2021		2021/2022		2022/2023	
Market Begin Year	Apr 2021		Apr 2022		Apr 2023	
Brazil	USDA Official	New Post	USDA Official	New Post	USDA Official	New Post
Area Harvested	1682	1682	1670	1640	0	1600
Beginning Stocks	214	214	575	620	0	250
Milled Production	8001	8006	7276	7200	0	7100
Rough Production	11766	11774	10700	10588	0	10441
Milling Rate (.9999)	6800	6800	6800	6800	0	6800
MY Imports	660	650	680	680	0	800
TY Imports	685	685	680	680	0	800
TY Imp. from U.S.	0	0	0	0	0	0
Total Supply	8875	8870	8531	8500	0	8150
MY Exports	850	900	800	850	0	600
TY Exports	782	782	800	850	0	600
Consumption and Residual	7450	7350	7450	7400	0	7400
Ending Stocks	575	620	281	250	0	150
Total Distribution	8875	8870	8531	8500	0	8150
Yield (Rough)	6.9952	7	6.4072	6.4561	0	6.5256
1000 HA, 1000 MT, MT/HA, TY 2021/22: Jan-Dec 2022						
Source: Post Brasilia						

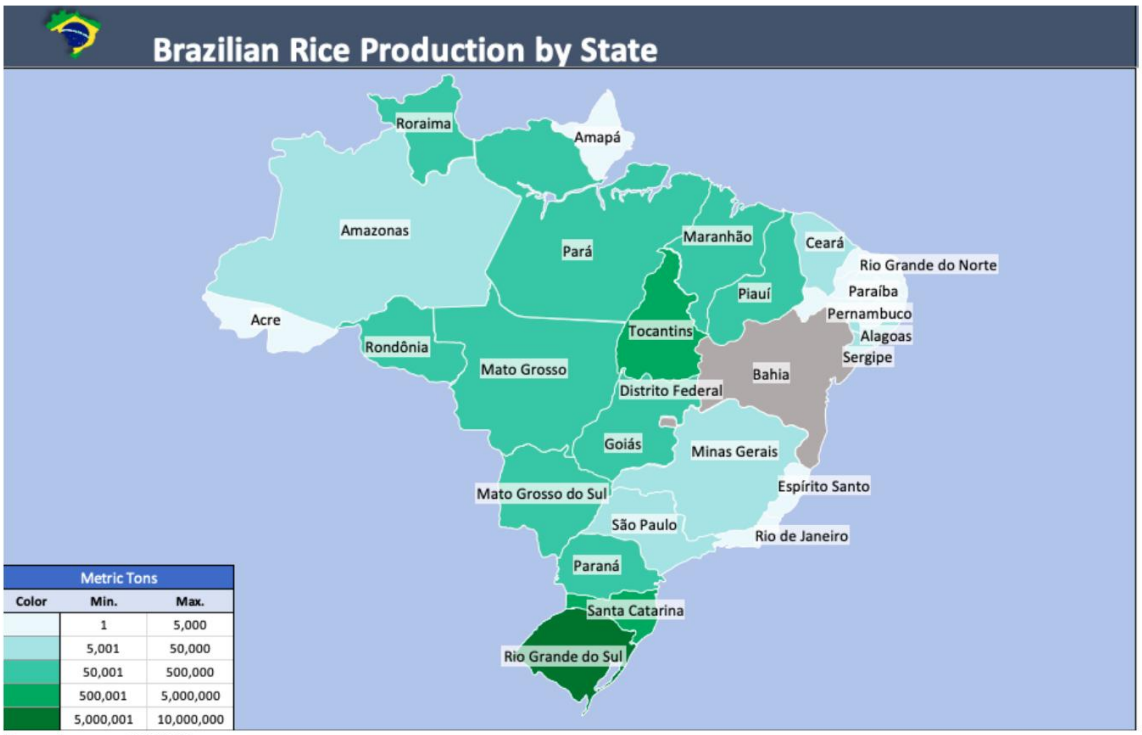
Rice Production

Planted Area and Production Projected Lower for 2022/23 on High Costs, Competition with Other Crops

For MY 2022/23 (April 2023 – March 2024), Post sets its initial forecast for rice area at 1.6 million hectares (ha), down from the estimated area of 1.64 ha harvested this season. Factoring in slightly lower than trend yields, Post projects that milled rice production will decrease to 7.1 million metric tons (MMT) of milled rice equivalent (an equivalent of 10.44 MMT of paddy rice) next season. The planted area forecast considers the rising domestic rice prices in Brazil, which are expected to strengthen in the coming months amid the supply crunch due to poor harvest in the current season. However, rice production costs have also been on the rise, and in conversations with the industry, most contacts ascertain that the current input prices make growing rice a losing proposition at the moment when the competing soybean and corn crops offer higher profitability and lower cost of production.

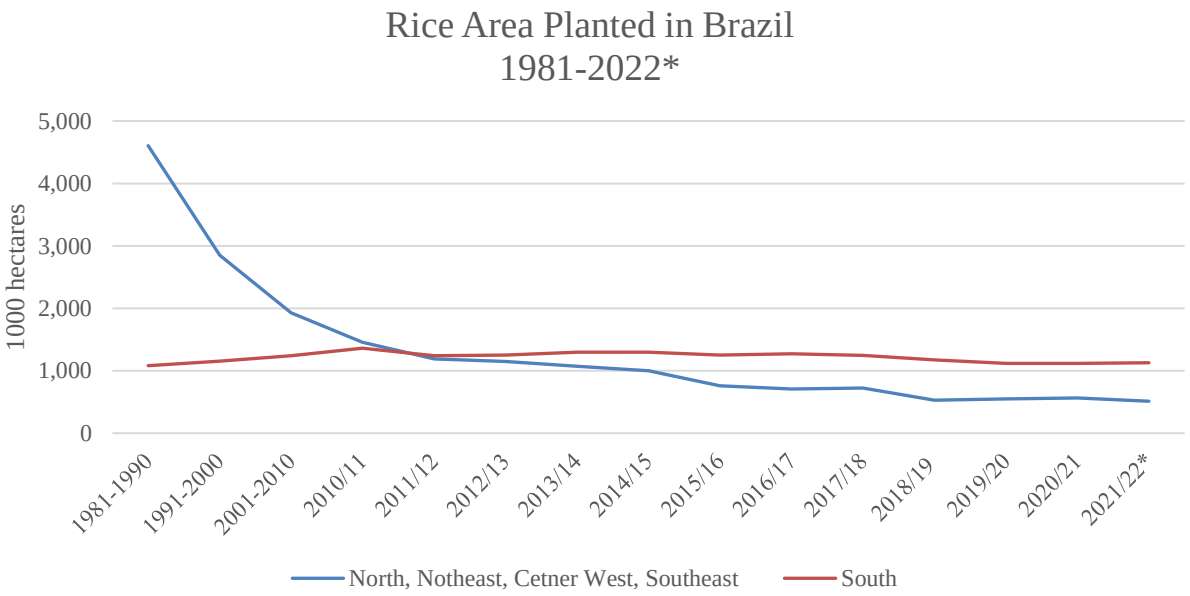
Given the factors outlined above, Post expects Brazilian producers to reduce rice area at the margins for the next market year (MY). Once widely spread throughout Brazil, rice production has become increasingly concentrated in the south of the country. Today, the vast majority of Brazil's rice fields are

located in two southern states, and close to 80 percent of rice fields are irrigated. According to the National Food Supply Company (CONAB), Brazil's agricultural statistics agency, the country's southernmost state, Rio Grande do Sul, is responsible for approximately 60 percent of Brazil's total rice area and 70 percent of total production, the vast majority of which is irrigated. The state of Santa Catarina, just north of Rio Grande do Sul, accounts for another 11 percent of Brazilian rice production and about 9 percent of the total rice area in the country.



Data Source: CONAB
Graphic: FAS Brasilia

Brazil's rice area has decreased by about 45 percent over the last 20 years, even as production volumes have stayed relatively stable thanks to improving yields. The long, steady shrinking of Brazil's rice area is largely due to a reduction in rainfed rice area throughout the country outside of Southern Brazil. In the 1980s, irrigate rice planted area in the South occupied around one million ha, the same as today. However, in this same time frame, rice planted area across other regions of Brazil shrunk from over 4.5 million ha to around 512,000 ha by 2022, according to CONAB data. The overall trend for Brazilian rice production over the last 20 years has been smaller area offset by improving yields, a tendency that has led to little change in production volumes over the last two decades. This has allowed Brazil to remain the world's largest rice producer outside of Asia.



Source: CONAB data, chart Post Brasilia

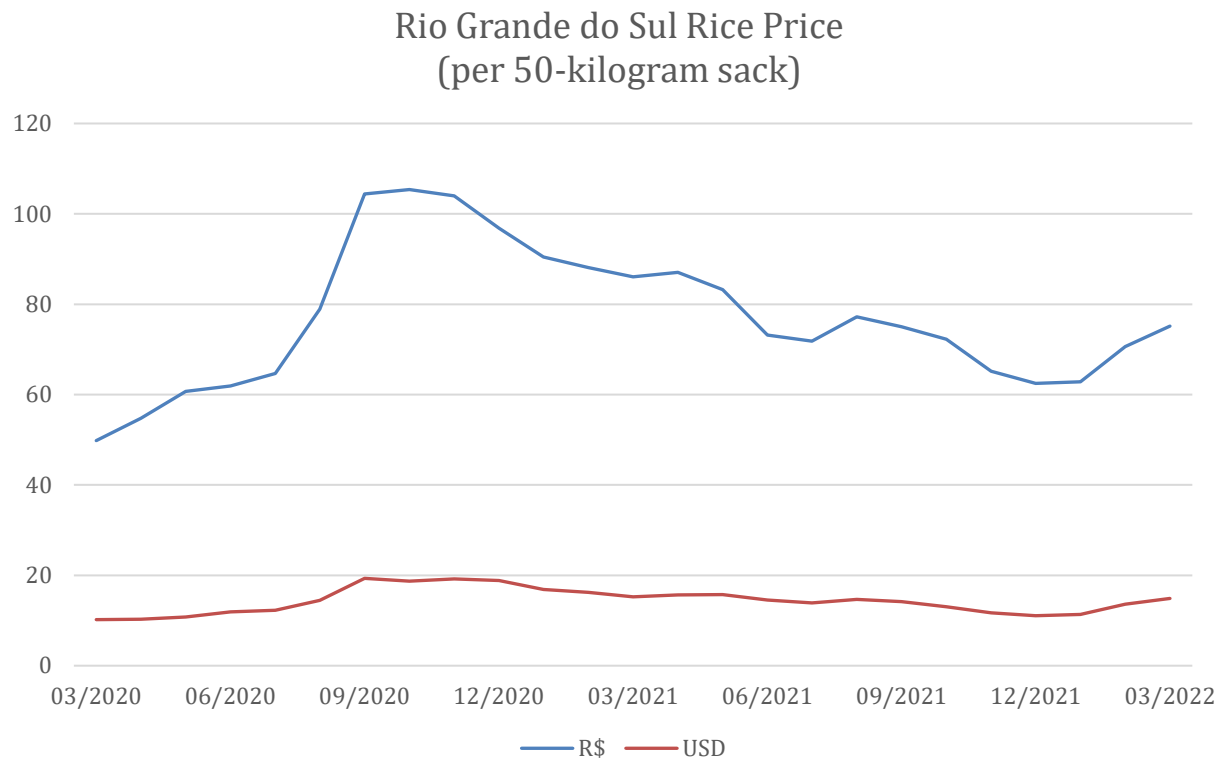
Post forecasts that rice planted area in the North, Northeast, Center West, and Southeast Brazil will fall to an all-time low of 500,000 ha next season. Post forecasts that planted area in the south will remain just above one million ha, as it is unlikely to shrink much more for several reasons. According to Post conversations with producers in Rio Grande do Sul state, although rice is less profitable due to the high cost of production and lower market price, the returns from rice farming are also more reliable. Corn and soybean yields are highly variable from one season to the next, while rice yields are more constant. Rice farming has also been a multi-generational practice for families in southern Brazil, so certain farmers are unlikely to switch over completely to other crops. It is important to note that some rice areas in the state are simply unfit for other crops due to poor drainage, so rice is likely to remain the dominant crop for some of the terrains.

Finally, many farmers in Rio Grande do Sul farm rice in conjunction with soybeans or corn as well as with livestock operations; this crop rotation pattern is most beneficial to the soil in southern Brazil. Growers typically switch between the two crops every year to maintain soil quality and control pests, weeds, and volunteer rice. According to the Federation of Rice Producers of Rio Grande do Sul (Federarroz), such a cycle of rotation can reduce production costs by as much as 15 percent and increase rice yields by 10-20 percent, depending on the condition of the land. Post interlocutors also indicate that in years when growers plant soy, many chose to plant forage grass that comes up at the same time as soy, but which remains in the field after the soy harvest. This crop/forage rotation allows for producers to either invest in their own livestock operations or to share their acres with ranchers. Cattle grazing during the winter season prior to rice planting adds further nutrients to the soil, amplifying yields.

Firm Rice Prices Will Not Compensate for Higher Production Costs

The University of Sao Paulo's Center for Advanced Studies in Applied Economics (CEPEA) data shows that domestic rice prices rose past R$75 per 50-kilogram sack as of the third week of March 2022, recovering from the low of R$ 62 reached just several months prior. The bump is attributed to poor

harvest in the current 2021/22 season. Domestic stocks are expected to reach an all-time low this season, and as Brazilian rice consumption is relatively inelastic prices are expected to remain around R$80 / per 50-kilogram sack. Post does not expect rice prices to retrace the highs of R$100 per sack registered in 2020. Early in the pandemic rice exports boomed amid steep depreciation of the Brazilian real. However, in 2022 and 2023, rice exports are expected to be constrained on the account of high maritime freight costs and the availability of containers.



Data Source: University of Sao Paulo Center for Advanced Studies in Applied Economics (CEPEA)

At the same time, the Rice Institute of Rio Grande do Sul (IRGA) projects that this year producers will see a 30 percent increase in total operating costs for rice. The operational cost for 2021/22 is R$ 12,542 per ha, of that 20 percent or R$ 2,269 per ha is earmarked for fertilizer. The second highest spending category is for water, at R$ 1,384. In conversations with producers, Post heard estimates of the cost of production from R$12,000 to R$14,000 per hectare. Although the cost projection for next season is not yet available, the 2021/22 calculation has been made taking into account input prices registered in December. Post contacts indicate that the market assumes that the production costs will continue to climb in 2022 and 2023, as prices of fertilizers rise on the likelihood of the absence of Russian fertilizer exports from global trade.

WEIGHTED AVERAGE PRODUCTION COST IRRIGATED RICE - PROJECTION

I - COST EXPENDITURE OF THE CROP (R$/ha)	R$/ha
Fuel	
1.1 - Crop operations	485.49
1.2 - Irrigation	134.69
Renovations and Maintenance	879.34
Electricity for Irrigation	1,124.11
Seeds	407.94
Fertilizer	2,268.97
Agrochemicals	1,209.10
Aviation	390.7
Internal Transportation	73.41
Fees: Waterer (commission), Administrator, Licensing	233.39
Water	1,383.78
Salaries	664.81
TOTAL CROP EXPENSES	9,255.73
OTHER EXPENSES, FINANCIAL EXPENSES	
Freight	342.47
Administrative Expenses (3%)	277.67
Drying	977.01
Taxes: CDO, FUNRAL	342.61
Fees: Agricultural Insurance (3%), Technical Assistance (2%)	462.78
21 - Interest rate without Official Funding	170.73
TOTAL OTHER EXPENSES	2,573.27
Depreciation	712.72
OPERATING COST (COST+ OTHER EXPENSES - DEPRECIATION)	12,541.73
FACTOR INCOME	
23 - Return on Capital	587.76
24 - Own Land	511.06
25 - Leased Land	1,433.55
TOTAL FACTOR INCOME	2,532.37
TOTAL COST	15,074.10

Source: IRGA (Publication Feb 2022)

Brazilian rice producers have long complained of high electricity costs to run irrigation systems, high debt levels and interest rates, high taxation rates, Mercosur competition, and cabotage regulations. While the government officials have made advances in lowering some hurdles for rice farmers, such as loosening cabotage regulations, the greater problem is that not all Brazilian rice producers have access to the same advantages in the market. Those with greater capital flows can make huge profits, even better than planting soybeans in years when rice yields are high. Generally, these producers have invested in drying and storage facilities that allow them to keep their harvested crop until rice prices rise later in the year (usually around August or September, when rice stocks are dwindling). They also have the capital to purchase inputs when the prices are lower and foreign exchange rates are more favorable.

Rice producers with less capital are often forced to sell their crops right after harvest when prices are depressed due to the flood of supply on the market. Rice millers, however, generally take advantage of this situation, building up stocks when prices are lower. Many producers also make financing agreements directly with mills, which provide the capital needed to pay for inputs and production costs.

2021/22 Rice Production Lower on Drought

For 2021/22 MY (April 2022 – March 2023), Post revised its estimated rice harvest area to 1.64 million ha, which represents a 2.5 percent contraction from the previous MY. The revision is based on inclement weather that has plagued the southern region of Brazil. As a result of drought, growers abandoned some of their rice fields. In addition, competition from other crops like corn and soybeans, which have seen soaring prices, continues to diminish rice planted area at the margins.

Harvest for the MY 2021/22 rice crop began in earnest in mid-February. As noted in the previous Grain and Feed update, the La Nina weather phenomenon has adversely affected portions of the two southern states of Rio Grande do Sul and Santa Catarina during the critical stages of the current rice crop. Post estimates rough rice production decreased by 12-14 percent total, so milled rice production is estimated at 7.2 MMT, (the equivalent of 10.6 MMT paddy rice). While the estimate represents a decrease of 800,000 MT from the production annually, it is important to note that the 2020/21 season saw record yields on the account of optimal weather conditions.

Rio Grande do Sul alone accounts for about 70 percent of the total volume produced. According to IRGA, as of mid-March, with one-third of the rice harvested, the average productivity of the 2021/2022 crop in the state is similar to the same time last year. However, the harvest has just started to reach its peak in the western parts of the state - Fronteira Oeste - which was the rice-growing region most affected by the drought. At the same time last year, yields in this region reached almost 9,130 kilograms per ha (kg/ha); the current average yield in this region is just over 8,000 kg/ha with half the volume collected.

In the neighboring state of Santa Catarina, the harvest is already more than 77 percent complete, according to the mid-March bulletin from CONAB. CONAB anticipates planted rice area in Santa Catarina to remain roughly the same as last season. At the same time yields are expected to drop by about 4 percent as compared to last season due to hotter than average weather. The resulting rice volume totals an estimated 815,000 MT of milled rice equivalent.

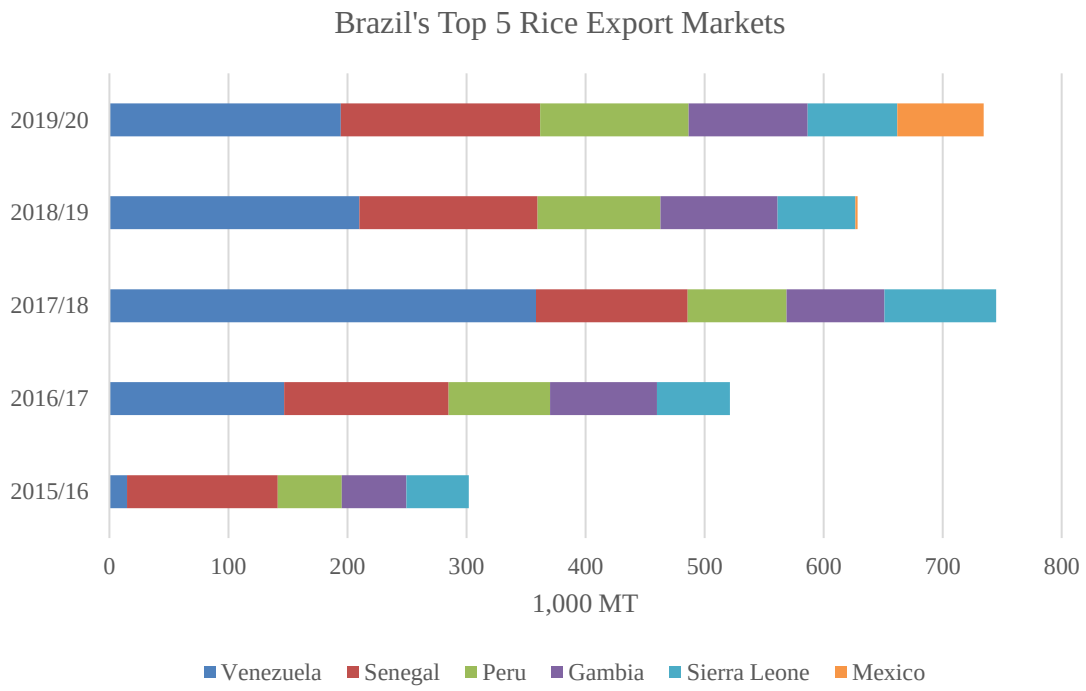
The Midwest region ranks third in rice production. The state of Mato Grosso is the main rice producer in this region. Unlike the Southern and Northeastern parts of the country, the weather in the cerrado region has been excellent for rice crop development. However, in 2021/22 growers diverted a sizeable portion of rice area toward soybean production, owing to record prices for that crop. CONAB estimates Mato Grosso farmers to sow just over 94,000 ha, a contraction of more than 23 percent on last season. Mato Grosso rice production is expected to come in at 220,000 MT of milled rice equivalent.

Rice Trade

Exports in 2022/23 and 2021/22 to be Constrained by Supply

Post sets initial 2022/23 rice export forecast at 600,000 MT based on the forecast production and supply. Post decreased the estimate for Brazil's 2021/22 rice exports by 50,000 MT to 850,000 MT on the account of lower than initially anticipated supply. Post forecast and estimate assume the Central Bank's expectation that the real will trade at above R$5 to the UD in 2022 and 2023. However, recently the real strengthened significantly to trade at R$4.75 to the USD as of the last week of March. A stronger real may incentivize additional exports, notwithstanding the limited supplies on the domestic market.

For now, although global rice demand has been rising, Post anticipates that Brazil will not have enough supply to satisfy both the domestic market and the trader demand. In addition, Post contacts indicate that exports continue to be disadvantaged by high maritime shipping costs for containers. Post contacts also indicate that the recent strengthening of the domestic currency is a further disadvantage for the Brazilian rice exports, given that international sales are generally dollar-denominated. Notably, Brazil's top five rice markets are price sensitive.



Source: CAMEX, Chart Post Brasilia

Although Brazil's rice prices were very competitive globally on the account of the favorable exchange rate over the course of 2020 and 2021, the high maritime freight rates and competition for vessels have meant that exports were down in 2020/21 across all categories of rice that Brazil exports. Much of the container shortage is associated with rapidly changing expectations and dynamics of trade in the wake of the pandemic and is not linked to any one specific commodity. That said, goods that require container storage, such as rice, have been much more affected than the commodities that can be shipped in open vessels, such as soybeans and corn. This season some Brazilian exporters started to use plastic packaging capable of a load of up to 2,000 kg of rice, shipping their product as general cargo. Although this lowers the transportation costs and reduces the waiting period at ports, this practice creates higher labor costs for loading and unloading the products, as well as increases the risk of damage to the products during transportation.

Venezuela has been one of the largest markets for Brazilian rice exports in recent years, and Post anticipates that trend to continue in the 2021/22 trade year. As Venezuela fell deep into political and economic turmoil several years ago, Brazil's abundant production and relative geographic proximity made it a convenient rice supplier. As the real has traded at above R$5 to the USD in the last two years, Brazilian commodities have continued to be relatively cheap on the international market. As a result, Venezuela has repeatedly turned to its South American neighbor to purchase staple foods like rice. Venezuela is set to remain the largest foreign market for Brazilian paddy rice for the fifth year in a row. With one month left in the 2020/21 market year, Brazil has already exported to Venezuela more than 158,000 MT of paddy rice and more than 80,000 MT of white rice, accounting for nearly one-fifth of total MY 2020/21 rice exports to date. Post estimate for Venezuela's purchases in 2020/21 takes into account the Brazilian Central Bank's Market Focus survey that anticipates the exchange rate at above R$5 to the USD. However, as of the end of March, the real is trading closer to R$4.75 to the USD. If the real continues to gain strength, Post estimate may need to be revised for Venezuela, as well as other price-sensitive markets.

Paddy Rice Exports

Exports of paddy rice saw almost a 25 percent decrease in the first 11 months of the 2020/21 season, with 236,000 MT shipped this MY, versus 317,000 MT shipped last MY. Although Venezuela maintained its position as the top importer of Brazilian paddy rice, so far this MY, the paddy export volumes to Venezuela are down by 22 percent from last year. Shipments to Mexico – the third-largest buyer, are down by 30 percent. Meanwhile, a handful of buyers increased their purchases, the most important one being Costa Rica with total volumes rising by close to 20 percent. The Netherlands and China bought Brazilian paddy rice this season for the first time. Meanwhile, other buyers, notably Turkey, Guatemala, and Honduras, that bought significant volumes of paddy rice in the 2019/20 season, did not import from Brazil this season.

Brazil's Exports of Paddy Rice MRE to Main Destinations

	2019/20 in MT (Apr-Feb)	2020/21 in MT (Apr-Feb)	Δ% 2020/21 from 2019/20	Δ in MT 2020/21 from 2019/20
Venezuela	111,025	86,635	-22%	(24,390)
Costa Rica	63,361	75,207	19%	11,846
Mexico	62,155	43,484	-30%	(18,671)
Nicaragua	15,925	19,790	24%	3,865
Netherlands	-	8,293	-	8,293
China	-	2,294	-	2,294
Paraguay	110	175	59%	65
Angola	-	19	-	19
Congo (DROC)	-	45	-	45
Uruguay	7	35	400%	28
World	**316,869**	**236,075**	**-25%**	**(80,794)**

Source: SECEX

White Rice Exports

Brazil's shipments of white rice were down by a third in the first 11 months of 2020/21 as compared to the same time last year. Notably, Cuba moved up to the leading buyer of Brazil's white rice, jumping from the third spot last season. Exports to Cabo Verde saw an over 40 percent increase; as a result, the small island cracked the top five buyer groups for Brazilian white rice, up from tenth place last year. The largest decrease in volumes shipped was registered to the United States.

Brazil's Exports of White Rice MRE to Main Destinations

	2019/20 in MT (Apr-Feb)	2020/21 in MT (Apr-Feb)	Δ% 2020/21 from 2019/20	Δ in MT 2020/21 from 2019/20
Cuba	60569	91198	51%	30,629
Peru	90,810	55,333	-39%	(35,477)
Venezuela	78,043	49,555	-37%	(28,488)
Cabo Verde	9402	13391	42%	3,989
United States	30,430	8,550	-72%	(21,880)
Total Exports	**437,743**	**295,131**	-33%	(142,612)

Source: SECEX

Broken Rice Exports

Volume-wise, Brazil's exports of paddy rice were down the most of all categories of exported rice, decreasing by over 166,000 MT in the first 11 months of 2020/21 MY, compared to the same time last season when Brazil's exports topped 430,000 MT. The steep drop-off in purchases of broken rice is attributed to Brazil's primary customers in Africa – Gambia, Senegal, and Sierra Leone – which make up the largest buying block. Collectively exports to those three markets were down more than 160,000 MT in the first 11 months of 2020/21 MY, as compared to the same period last season.

Those losses were somewhat couched by purchases from the Netherlands, which emerged as the single largest buyer of Brazilian broken rice. The Netherlands is an important entry point for rice that is then shipped onwards to other European markets. European buyers of broken rice typically use the product for further processing into breakfast cereals, pet food, beers, starch, and flour. The United States imported 27,000 MT of broken rice from Brazil in this time frame.

Brazil's Exports of Broken Rice to Main Destinations

	Q1-Q3 2019/20 in MT	Q1-Q3 2020/21 in MT	Δ% 2020/21 from 2019/20	Δ in MT 2020/21 from 2019/20
Netherlands	49,553	70,968	43%	21,415
Senegal	167,291	64,040	-62%	(103,251)
Gambia	98,097	61,131	-38%	(36,966)
Sierra Leone	75,200	35,000	-53%	(40,200)
United States	26,250	27,060	3%	810
Spain	-	2,117	----	2,117
South Africa	920	1,747	90%	827
Chile	2,171	1,481	-32%	(690)
Germany	-	543	----	543
Total Exports	**430,402**	**264,272**	**-39%**	**(166,130)**

Source: SECEX

Imports to Remain Below One MMT

For 2022/23 MY, Post sets its initial import forecast at 800,000 MT, based on the expectation of lower supply. For 2021/22 MY, Post estimates imports at 680,000 MT. The estimate is based on a shortfall in production this season. Post also considers the outlook for the exchange rate, which is forecast at above R$5 to the USD. However, should the real trade below that level, it is likely that the Brazilian millers will take advantage to bump up their duty-free purchase orders from its Mercosur trade bloc neighbors: Paraguay, Uruguay, and Argentina. Post anticipates that purchases from Mercosur will dominate Brazilian imports this season and next.

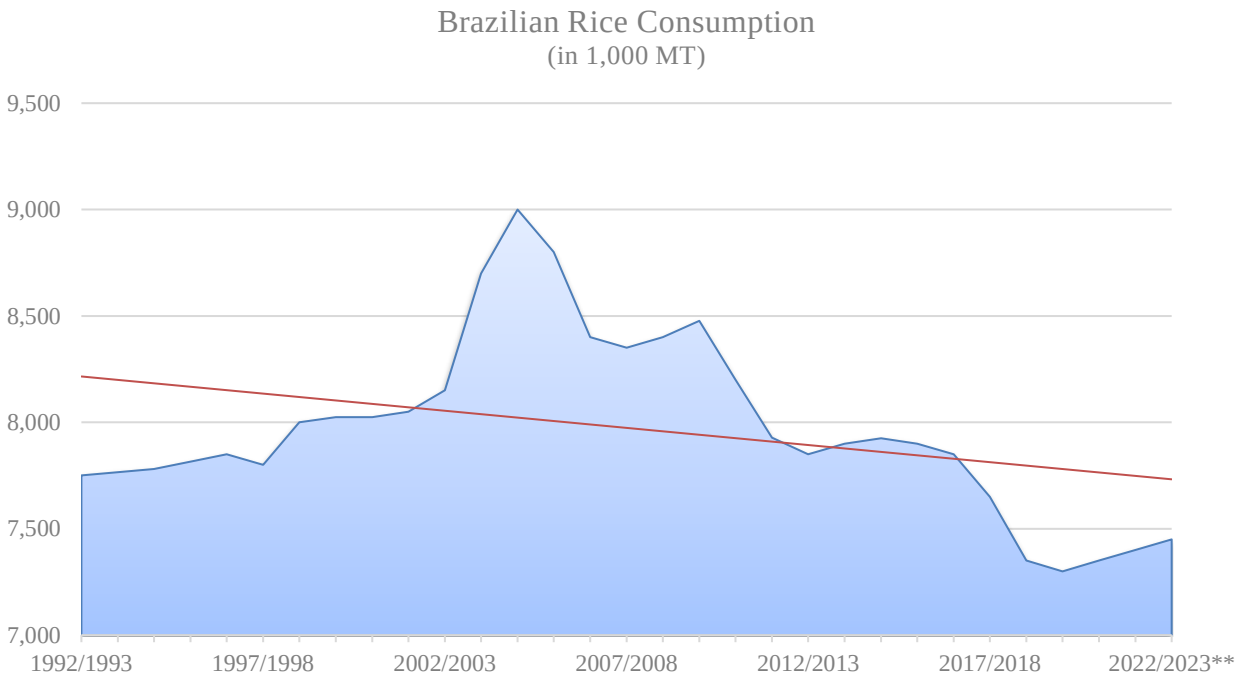
In the first 11 months of the 2020/21 trade year, Mercosur supplied 97% of Brazilian rice imports. Of those volumes, Paraguay alone accounted for 75 percent, Uruguay supplied another 13 percent of imports, and Argentina was responsible for approximately 9 percent. In the last five years, Brazil's Mercosur partners typically accounted for 95 percent or more of their rice import volumes, due to their geographic proximity and duty-free access to the Brazilian market. One exception to this trend was the 2019/20 trade year when the government had instituted a quota for duty-free access for up to 400,000 MT of paddy and milled rice from September to December 2020. The TRQ relaxed the 10 percent import tax on paddy rice and 12 percent import tariff on milled rice, with the United States, Guyana, India, and Thailand being the main beneficiaries.

Post anticipates that there is a limited probability the Brazilian government will opt to implement another duty-free quota for rice imports in 2022. Two years ago, rice millers and industry groups urged the government to act due to skyrocketing price inflation that surged on the back of huge export volumes and strong domestic consumption at the start of the pandemic. There is some concern in Brazil that food inflation will begin to increase exponentially due to the disruption of commodity flows from the Black Sea region. However, rice is less likely to be affected than wheat, corn, and even soybeans.

Rice Consumption

For 2022/23 MY, Post sets its initial consumption forecast at 7.4 MMT of milled rice equivalent, on par with the amount estimated for the 2021/22 season. For this season and next, the increase in consumption is based on trendline population growth, the expectation of a moderately growing GDP.

Rice is a staple food in Brazil, with many Brazilians consuming it with beans one or two times every day. According to CONAB data, nearly 95 percent of Brazilians consume rice on a regular basis, with more than half doing so at least once every day. However, the annual consumption volume (gross and per capita) has trended downward over the last two decades, as Brazilians have been replacing some of their rice consumption with other starchy staples, such as bread, potatoes, and manioc. Post anticipates that in the next two seasons rice purchases will get a boost as prices for other staple goods from bread to meat, dairy, and eggs will see higher food inflation on account of global agricultural commodity trade disruptions.



Source: USDA/FAS PSD Online, 2022/23** represents Post forecast. Chart Post Brasilia.

WHEAT PSD

Wheat	2020/2021		2021/2022		2022/2023	
Market Begin Year	Oct 2020		Oct 2021		Oct 2022	
Brazil	USDA Official	New Post	USDA Official	New Post	USDA Official	New Post
Area Harvested	2340	2500	2740	2700	0	3400
Beginning Stocks	761	761	431	981	0	221
Production	6250	6800	7700	7740	0	8800
MY Imports	6395	6395	6700	6500	0	6200
TY Imports	6359	6359	6700	6500	0	0
TY Imp. from U.S.	508	508	0	0	0	0
Total Supply	13406	13956	14831	15221	0	15221
MY Exports	925	925	1700	2800	0	3000
TY Exports	911	911	1700	2800	0	3000
Feed and Residual	400	400	800	700	0	600
FSI Consumption	11650	11650	11700	11500	0	11400
Total Consumption	12050	12050	12500	12200	0	12000
Ending Stocks	431	981	631	221	0	221
Total Distribution	13406	13956	14831	15221	0	15221
Yield	2.6709	2.72	2.8102	2.8667	0	2.5882
1000 HA, 1000 MT, MT/HA, TY: July-June						
Source: Post Brasilia						

WHEAT PRODUCTION

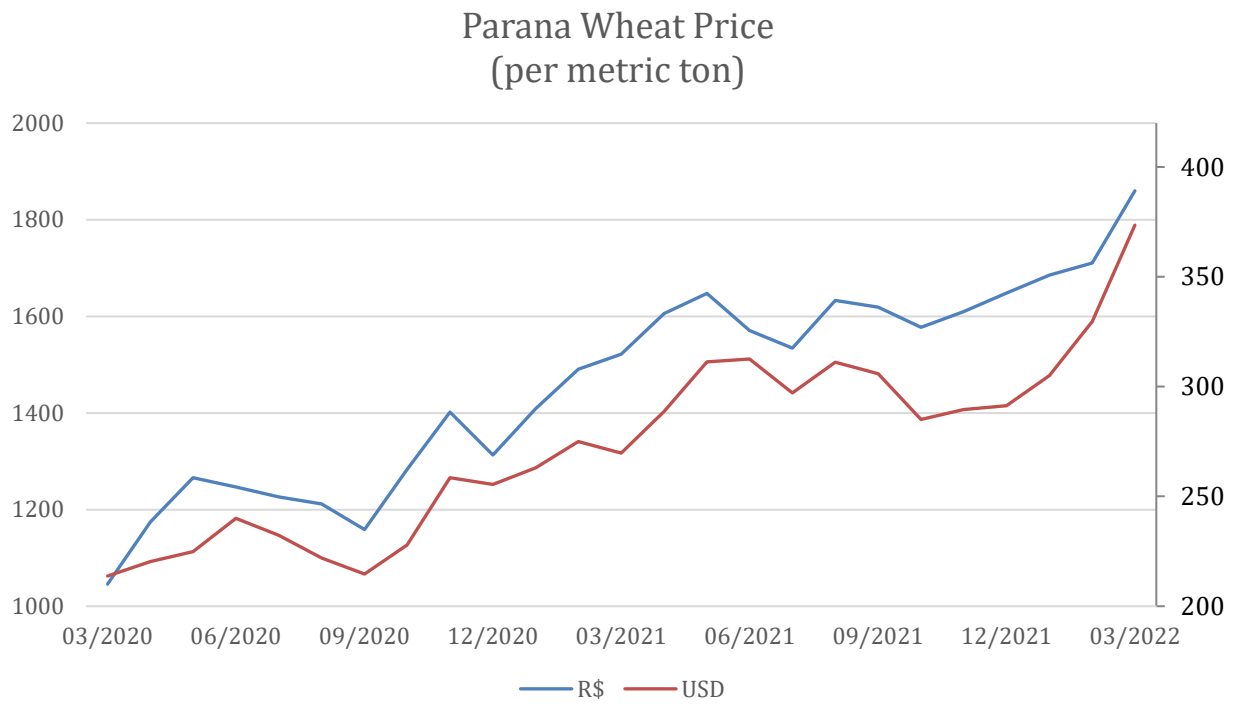
Bumper Crop Expected Next Season

For MY 2022/23 (October 2022 – September 2023), Post sets its initial forecast for the wheat area at 3.4 million hectares (ha), which represents an increase of over 25 percent on the current season. Historically high global wheat prices are pushing farmers to dramatically expand wheat cultivation, notwithstanding concerns regarding fertilizer supply and climbing costs of production. Post sets the initial yield forecast at 2.59 metric tons per hectare (mt/ha), which is slightly below the yields registered in the last several seasons. Factoring in the productivity forecast, Post expects Brazil to surpass the current record wheat crop by some two million metric tons (MMT), reaching an output of 8.8 MMT for the 2022/23 season.

Wheat Prices Supported by Export Demand to Drive Expansion

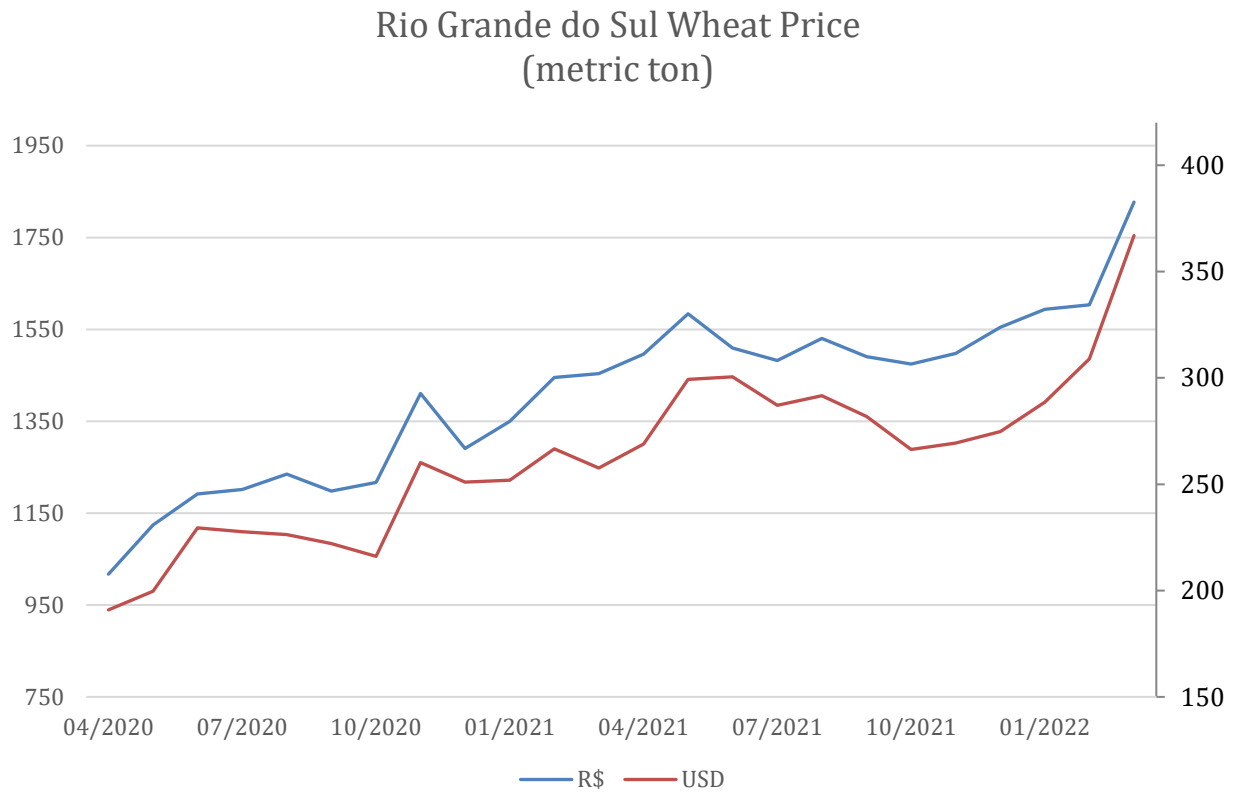
The expansion in area planting will be primarily driven by the increasing profitability of the crop, as domestic and global prices are expected to continue to climb, renewing record highs.
According to a data series maintained by the University of Sao Paulo's Center for Advanced Studies in Applied Economics (CEPEA), wheat prices in Brazil have renewed record levels every month for the last six months. The CEPEA Index shows that in March 2022, prices in the two leading wheat producer

states of Parana and Rio Grande do Sul have registered nominal historical records of the Index, which dates to 2004.



Source: CEPEA data, chart Post Brasilia

As of March 30, the monthly average price of wheat in Parana hit R$ 1,860 (US$ 374) per MT, up 22 percent from the same month last year, and close to double from March 2020 when prices averaged R$ 1045 per MT. Wheat prices in Rio Grande do Sul are following the same pattern, with prices averaging R$ 1827 (U$ 367) per MT in March 2022, 26 percent higher than at this time last year, and more than double the price level two years ago when a metric ton of wheat fetched R$ 898. Notably, prices have continued to set new highs despite a record harvest coming online in the same timeframe. Post contacts generally expect wheat prices to continue climbing amid the ongoing armed conflict in the Black Sea region, which is threatening to jeopardize over a quarter of the global wheat trade next season.



Source: CEPEA data, chart Post Brasilia

Recent wheat price increases are building off a trendline increase that was registered during much of 2021. Last season, Brazilian wheat prices were bolstered by firm internal demand, depleted stocks, and limited supplies on the global market. Moreover, the weak Brazilian real made Brazilian commodities very affordable in the international market, especially since trade is typically dollar-denominated. Unlike soybeans and corn, Brazilian producers do not generally forward contract wheat, leaving producers to hope high price levels are maintained at the time of harvest, which was the case over the last two seasons. Post contacts report that the expectation of strong global demand and record prices will underpin growers' intent to sow more wheat for the 2022/23 season.

Fertilizer Supply and Costs are a Wild Card

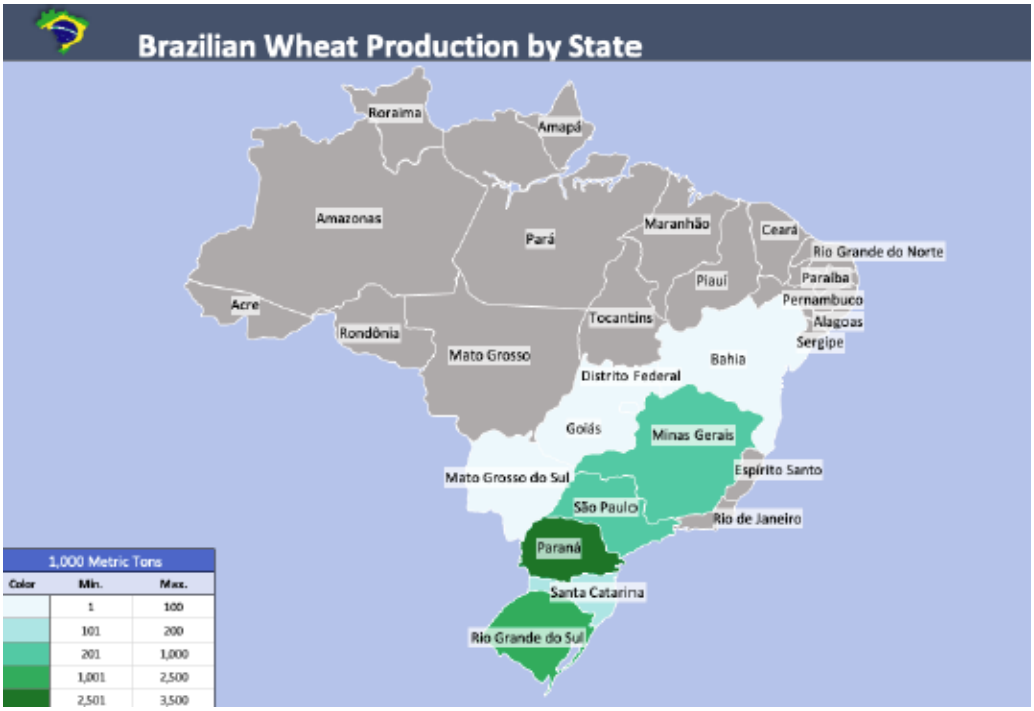
As already discussed in the corn section of this report, Brazilian growers rely almost exclusively on imported fertilizers to prepare the soil for their massive grain harvests every year. Most of Brazil's wheat is sowed in the Southern Hemisphere's winter months of May and June in the Southern region of the country. As such, wheat will be the first major crop in Brazil to be planted amid fears of a fertilizer supply crunch. Notably, the Brazilian National Association for Fertilizer Dissemination (ANDA) noted in March that fertilizer supplies should last through May. Post contacts confirmed that input contracts for the winter crop were mostly concluded well before the conflict began and that the deliveries are currently ongoing. However, it is difficult to estimate whether 100 percent of contracts will be fulfilled. Furthermore, it is unclear whether those producers who cultivate soybeans and corn may choose to save some of their inputs for those crops.

Similar to corn and other commodities, some wheat producers may choose to reduce their fertilizer application simply because they are priced out of the market. According to the Parana Department of Rural Economy (Deral), as of February 2022, the variable cost of wheat production in the state increased by 64 percent on last season to R$ 93 per 60-kilogram (kg) bag of wheat, up from R$ 57.11 per 60-kg bag last season. The outlays on fertilizers account for the single largest line item for producers and represent 40 percent of the total cost of production. DERAL notes that by February 2022, fertilizer costs had doubled from the same month last year. Notably, DERAL estimates that farm gate prices in February 2022 only registered R$ 90 per 60-kg bag, though over the course of the last several weeks rose to surpass R$100 per 60-kg bag.

Despite Expansion Across Brazil, Planting Area to Remain Concentrated in the South

Post anticipates that planted area will expand across all wheat-growing states, though Rio Grande do Sul and Parana will remain the undisputed leaders in wheat production. Industry contacts report that Parana may expand wheat area upwards to 1.55 million ha next season, up from the current season estimate of 1.2 million ha. In Parana wheat is generally grown as a winter crop in center-south, south, and southeast Parana, where the climate is cooler and not suitable for second season corn cultivation. In other portions of the state, wheat competes directly with corn as a second-crop alternative. Growers in the state have been favoring corn because of the lower cost of production, as well as lower risk from inclement weather which affects wheat quality more so than corn. However, during seasons when the soybean harvest is delayed and growers are unable to plant corn by mid-March, some elect to plant wheat. DERAL estimates that as of the end of March, there was still about one million ha of soybeans in Parana left to be harvested leaving ample area for wheat to expand.

Unlike most leading agricultural producer states in Brazil, Rio Grande do Sul generally cultivates one crop per season owing to its colder climate. The large, commercially oriented farms typically switch between growing soybeans or corn one season and rice the next. The Rio Grande do Sul Extension Service (EMATER/RS) estimates that these three main crops are cultivated on just over 8 million ha of land. However, portions of the state are suitable for an off-season, winter crop. EMATER estimates that growers cultivate about 1.6 million ha of winter crops in the state, which represents 20 percent of the summer crop area. Of the 1.6 million ha, wheat is by far the most popular with 1.18 million ha sown during the current season. The Federation of Agriculture of Rio Grande do Sul (FARSUL) and the Brazilian Association of Animal Proteins (ABPA) are spearheading a project to double the winter crop area to 3.2 million ha in the state. The primary beneficiary of this increase is likely to be wheat, which may be used for both animal feed and human consumption, depending on the quality of the crop. For next season, Post anticipates that wheat planted area may increase between 200,000 to 300,000 ha to approach 1.5 million ha.



Source: CONAB, Graphic by Post Brasilia

Outside of the southern region of Brazil, five other states and the capital Federal District also cultivate wheat. However, their combined contribution to national production accounts for just 10 percent. Although Brazil dominates in other crop cultures such as soybeans and corn, the tropical climate does not have the right conditions for growing the traditional varieties of wheat. However, the Wheat Millers' Association (Abitrigo) has now lobbied for several years for the Brazilian government to adopt the so-called "National Wheat Policy," which, among other things, aims to dramatically increase wheat cultivation in Brazil. According to Abitrigo, failing to achieve self-sufficiency in wheat production leaves Brazil vulnerable to the whims of exporting countries that could place limitations on foreign sales of wheat. Post expects Abitrigo's calls to gain more traction in the near term, given the current wheat trade disruption and uncertainty around the 2022/23 wheat season amid the upheaval in the Black Sea region.

Brazilian research agricultural arm Embrapa has been developing tropical wheat varieties with several already in commercial production in the Center-West state of Goias and the Federal District, as well as the southeastern state of Minas Gerais. These irrigated wheat varieties tolerate the hotter climate of the cerrado biome, as well as resist fungal diseases during periods of high humidity. Embrapa is optimistic about the prospects because these varieties have shorter growing cycles and the ability to adapt to tropical climate conditions with scarce rainfall. Current data shows that tropical wheat cultivars have a growing cycle of 76-93 days - about half the time it takes to grow wheat in southern Brazil - and produced yields as high as 4.7 MT/ha. Post anticipates that planted area expansion may be on the order of 20 to 40 percent next season, pending farmers' willingness to invest in the costly irrigation systems.

Another cerrado region targeted for wheat expansion is Matopiba, encompassing the border convergence area for the Northeastern states of Maranhao, Tocantins, Piaui, and Bahia. According to CONAB data, in the last two seasons, Matopiba doubled its planted wheat area to about 6,000 ha of commercial wheat

production, all in the state of Bahia. Post anticipates that area may increase by another 2,000 ha in 2022/23.

2021/22 Wheat Crop Sets a Record

For 2020/21 MY, Post revised the estimate area harvested to 2.5 million, and the production estimate to 6.8 MMT. The estimate is inline with the revision by CONAB, and correlates to Post conversations with the industry that point to a larger crop than initially estimated. For 2021/22 MY, Post maintained its estimated wheat area at 2.7 million ha, and the production estimate was increased slightly to 7.74 MMT. The 2021/22 season is a record for Brazil, even though the production estimate is somewhat below the initial expectations for the season. Productivity had to be revised on the account of prolonged periods of drought and the incidence of frosts in the South of the country. The two large agricultural producer states of Rio Grande do Sul and Parana remain the undisputed leaders in wheat production in Brazil. Between the two states, growers hauled in over 6.6 MMT of wheat, equivalent to 90 percent of the total wheat volume produced by Brazil.

The EMATER/RS estimates wheat harvested area at 1.18 million ha, an increase of more than 23 percent on the previous season. The wheat farmers in Rio Grande do Sul saw an incredible boost to their yields this season, which improved by more than 30 percent on last season, jumping to 2.89 kilograms per hectare (kg/ha). Between excellent yields and larger planted area, the farmers in the state hauled in an impressive 3.41 MMT of wheat, putting them in first place in terms of production. The 2021/22 wheat harvest in the state represents a 62 percent increase on the previous season.

The DERAL report for Parana state indicates that growers harvested just over 1.2 million ha this season, with the harvest totaling 3.22 MMT. DERAL had initially forecast 4 MMT for wheat production for 2021/22 MY, however, yields were lowered on the account of frosts that hit the region during the June-August 2021 timeframe. Post contacts indicate that the quality of the wheat also suffered as a result of inclement weather, with as much as 20 percent of the wheat being diverted to animal feed instead of being milled for human consumption.

Although the state of Santa Catarina, located between Rio Grande do Sul and Parana, is much smaller than its two neighbors, it emerged as the third-largest producer of wheat in the country. According to the state's research and extension service (Epagri), growers in the state almost doubled their wheat planting area during the 2021/22 season to 102,800 ha, up from 58,400 ha sown last season. As a result, production increased two-fold to 348,000 MT. Santa Catarina's impressive performance this season edged out the southeast states of Minas Gerais and Sao Paulo, where farmers typically jockey for the number three position in wheat production. Southeast Brazil saw similar adverse events to Parana, with drought leading to yield reductions. CONAB reports that growers in Minas Gerais produced 177,000 MT of wheat, while growers in Sao Paulo collected 265,000 MT of wheat. Nevertheless, the latest harvest figures for the Southeast were somewhat higher than during the middle of harvest and were the reason for the small upward revision in the total 2021/22 harvest.

Wheat Trade

Global Wheat Trade Dynamics to Drive a Paradigm Shift for Brazil

Post sets its initial 2022/23 wheat import forecast at 6.2 MMT on a wheat grain equivalent basis (WGE). Note that USDA uses WGE for trade numbers, which in addition to wheat grain, include flour and wheat product volumes adjusted on a wheat grain equivalent basis. Despite the spike in global wheat prices, Post anticipates that Brazil will continue to bring in significant import volumes of wheat from neighboring Argentina. Given Argentina's geographic proximity to Brazil, as well as the duty-free trade union among Mercosur members, wheat imports from Argentina will continue to be attractive for the Brazilian mills.

Post sets its initial 2022/23 export forecast at 3 MMT on a wheat grain equivalent basis (WGE). The forecast takes into account the brisk pace of exports seen in the first half of 2021/22 and the expectation that global wheat demand will remain firm well into 2023. Wheat exports in excess of one MMT are a huge paradigm shift for Brazil, which generally exports only a small share of its wheat production amounting to around 10 percent. If this wheat trade dynamic persists over several seasons, Brazil may substantially grow its wheat production to emerge as a global player in wheat exports.

2021/22 Imports to Level Off on Price Dynamics

Post revised its import estimate for 2020/21MY to 6.4 MMT on a wheat grain equivalent basis (WGE), based on the pace of trade. The estimate factors in the expectation that global wheat prices will continue to rise. Post assumes the exchange rate of R$ 5 to the USD, as projected by the Central Bank market survey. However, as of late March, the real is trading closer to R$ 4.75 to the USD. If the domestic currency continues to strengthen, then traders may take advantage to bring in more dollar-denominated imports.

Imported wheat typically accounts for more than half of Brazil's domestic consumption, making Brazil the fourth-largest global wheat importer. Nevertheless, over the last five seasons, Post estimates that imports dropped from about 60 percent of Brazil's consumption to less than 54 percent in the current season. Brazil saw a decrease in import demand on the account of an uptick in production in the last two years, coupled with a steep devaluation of the domestic currency, which has made dollar-dominated imports more expensive and reduced mills' willingness to make large purchases unless necessary to meet demand.

Most of Brazil's imports are duty-free purchases from Mercosur-neighbor Argentina, which supplied over 70 percent of Brazil's wheat imports in 2020/21. Uruguay and Paraguay were responsible for about 6 percent each of Brazil's imports, while the United States accounted for 5 percent of Brazil's imports. The United States saw a substantial bump in wheat shipments to Brazil in 2019/20 MY at least in part due to Brazil's implementation in November 2019 of an annual duty-free tariff-rate quota (TRQ) for 750,000 MT of non-Mercosur wheat imports. On December 1, 2020, the Brazilian President issued

decree No. 10,577 to make the TRQ permanent, meaning that it will no longer have to be renewed on an annual basis by Brazil's Foreign Trade Chamber (CAMEX).

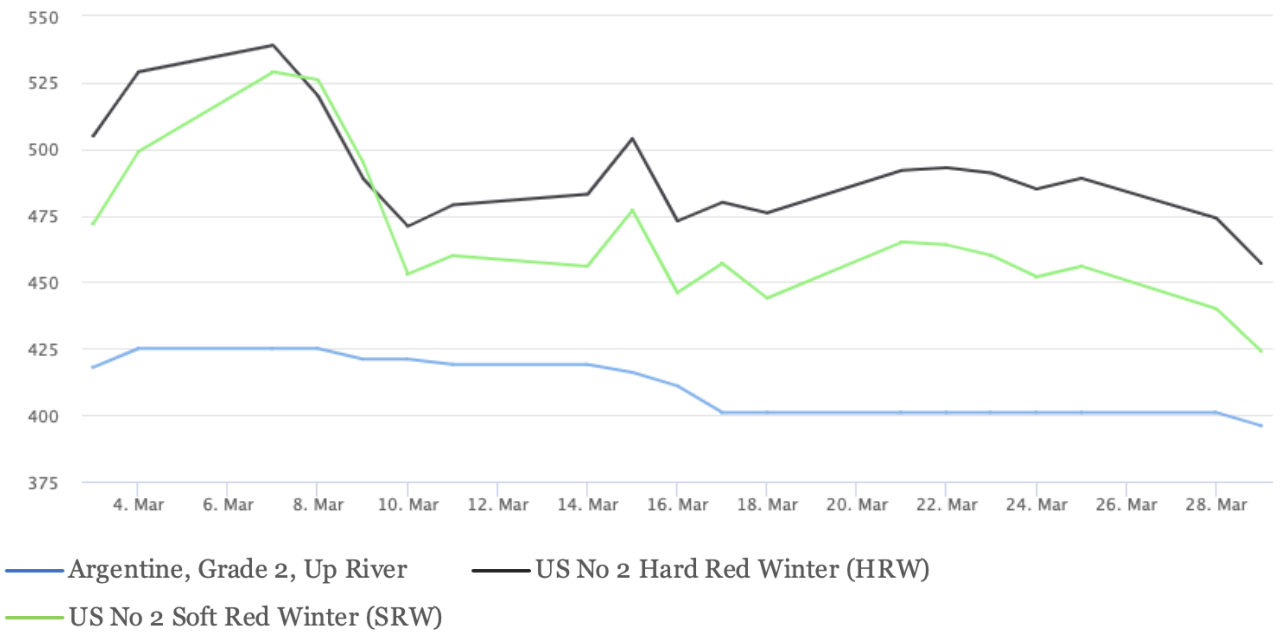
Brazil's Wheat Imports by Partner

	2018/19		2019/20		2020/21	
Partner	MT	% of total	MT	% of total	MT	% of total
Argentina	5,900,847	84.1%	5,540,577	78.8%	4,562,243	71.3%
Uruguay	135,336	1.9%	181,110	2.6%	404,320	6.3%
Paraguay	499,657	7.1%	262,871	3.7%	365,664	5.7%
United States	297,012	4.2%	707,045	10.1%	333,505	5.2%
Russia	19,235	0.3%	171,374	2.4%	150,747	2.4%
Canada	121,346	1.7%	116,552	1.7%	40,672	0.6%
World Total	**7,020,038**		**7,028,619**		**6,395,196**	

Source: SECEX

In any given season, the TRQ accounts for just over 10 percent of Brazil's total wheat imports. All other non-Mercosur wheat imports face a 10 percent common external tariff (TEC). Thus Mercosur, and in particular agricultural powerhouse Argentina, are the dominant suppliers of wheat to Brazil. Monthly shipments from Argentina are the highest during the first half of the calendar year, given the timing of the harvest there. Meanwhile, U.S. wheat exports to Brazil gain competitiveness later in the year, with the largest volumes arriving normally between July and November. However, in 2021/22, Post does not anticipate wheat shipments from the United States on the account of strong global prices.

Wheat Prices in US$/ton



Source: IGC

2021/22 Exports to Smash Previous Export Expectations

Post completely revised its 2021/22 MY export estimate to 2.8 MMT WGE, based on the pace of trade. The previous expectation of one MMT in wheat exports for the season previewed in the December GAIN update was already met in the first four months of 2021/22. In fact, the February volume of wheat exports surpassed 839,000 MT coming close to the volume shipped in all of the previous 2020/21 season. Brazilian Association of Cereal Exporters (ANEC) estimates that March shipments will come in at around 500,000 MT; if that expectation is met, Brazilian wheat exports in the first half of the season will amount to over 2.5 MMT. Post anticipates that the current brisk pace of shipments will level off as Brazil will simply run out of wheat to export towards the tail end of the season.

Saudi Arabia has emerged as the largest importer of Brazilian wheat in the first five months of the 2021/22 season, followed closely by Indonesia. Morocco made significant purchases, raising its volumes fivefold from the amount purchased during the entire previous MY, which puts it as the third-largest buyer of Brazilian wheat. Turkey has procured significant wheat volumes from Brazil for the first time. Other top destinations reflect geographic diversity and include Vietnam, Pakistan, South Africa, Ecuador, and Sudan. Post anticipates that for the remainder of the season Brazil will continue to ship to a diverse customer base, though exports to the Middle East and North Africa may rise proportionally more than to other destinations as Brazil looks to secure increased fertilizer flows from this region in a barter exchange for crop shipments.

Top 10 Markets for Brazilian Wheat (in MT)

	2019/20	2020/21	Oct 21-Feb 22
Saudi Arabia	62,460	141,068	467,835
Indonesia	-	123,000	453,320
Morocco	-	45,342	229,738
Pakistan	-	65,684	197,520
Vietnam	247,949	232,830	190,800
Turkey	3	2	125,931
South Africa	35	-	122,547
Ecuador	41	4	65,610
Israel	-	54,000	60,821
Sudan	-	-	57,500
World Total	**425,130**	**925,084**	**2,048,079**

Source: SECEX

Wheat Consumption

Post sets its initial 2022/23 consumption forecast at 12 MMT and revised down its estimate for 2021/22 consumption to 12.3 MMT. Per-capita consumption of wheat in Brazil has slumped in recent years but has been offset by population growth, leaving the overall wheat consumption level relatively static. However, Post anticipates that consumers will scale back their purchases of wheat-based products in the second half of 2022 and into 2023, as price inflation takes hold.

ABITRIGO has already warned that wheat prices are likely to increase in the coming months, though the association reinforced that Brazil should not have wheat supply problems in the short term. In fact, industry data indicates that flour mills should have higher than normal stocks currently. According to DERAL, although farm gate wheat prices in Parana state saw a substantial jump in the last several weeks, flour prices increased just four percent from February to March. This may be attributed to the record 2021/22 harvest, which has enabled millers to replenish their supplies at the end of 2021 and early on in 2022.

Nevertheless, Post contacts expect that prices of wheat-based goods in Brazil are likely to trace the same trajectory as the rest of the world, even if it will not be as dramatic. In March 2022, the Brazilian Manufacturers Association of Biscuit, Pasta, and Industrialized Bread & Cakes (ABIMAPI) warned that end-consumer product prices will rise in the coming weeks and months as a result of the global price spike due to the conflict between Russia and Ukraine. ABIMAPI noted that flour makes up 70 percent of the cost of pasta, 60 percent of industrialized breads and cakes, and 30 percent of cookies. As a direct consequence, lower-middle-class consumers are likely to seek alternatives for wheat-based products, subbing rice for pasta and scaling back bread purchases. Based on this expectation, Post projects a decrease in wheat food, seed, and industrial (FSI) consumption to 11.4 MMT in 2022/23, and to 11.5 MMT in 2021/22 from 11.65 MT registered in 2020/21.

Attachments:

No Attachments