CFTC AGRICULTURAL ADVISORY COMMITTEE MEETING

State of Global Ag Markets

April 05, 2023

Gro Intelligence

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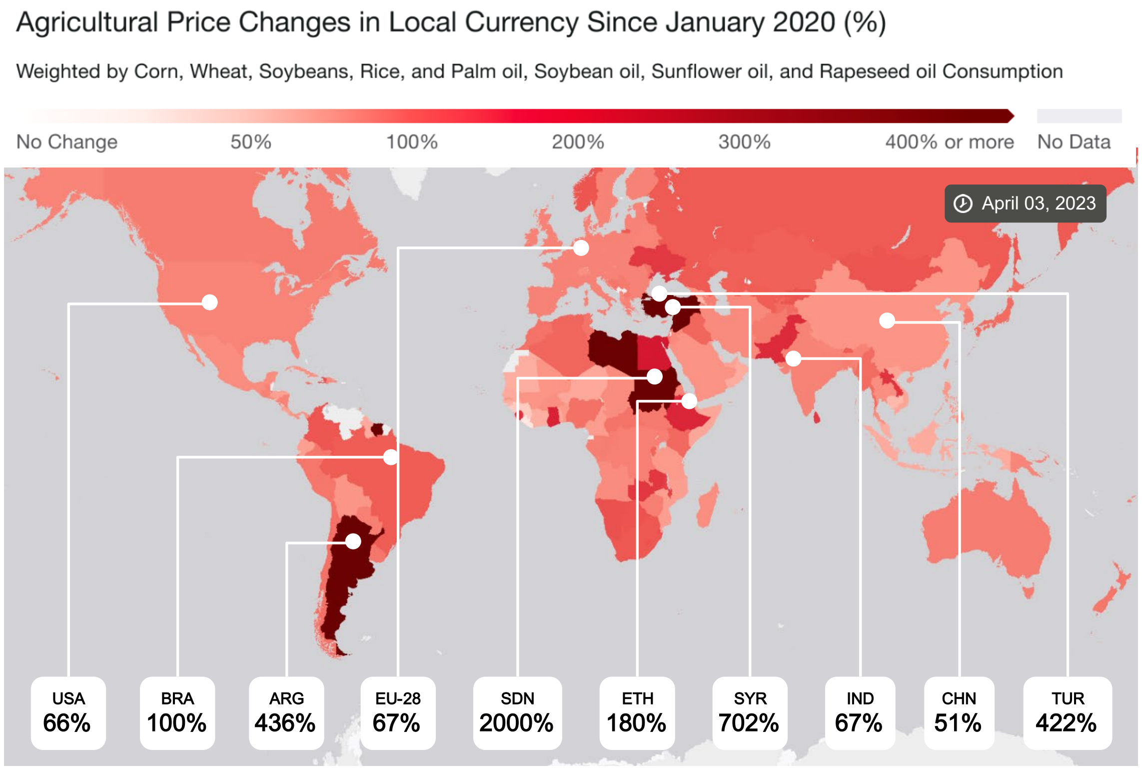
Macro Trends

Food Inflation is a Persistent Global Problem

- Global food inflation is being driven by a combination of increases in global agricultural prices and local currency moves due to a strengthening dollar.
- **The problem is global and persistent. It is being driven by structural supply and demand issues that only got exacerbated by covid and the Russia-Ukraine war.**



Source: Gro Intelligence

Currency Shifts are Impacting Import Prices

The price of imported wheat into Egypt continues to rise. Prices have risen beyond levels set after the start of the Russia-Ukraine war due to the Egyptian Pound dropping 41% y/y. This is in stark contrast to wheat futures being down 45% relative to their 2022 highs.

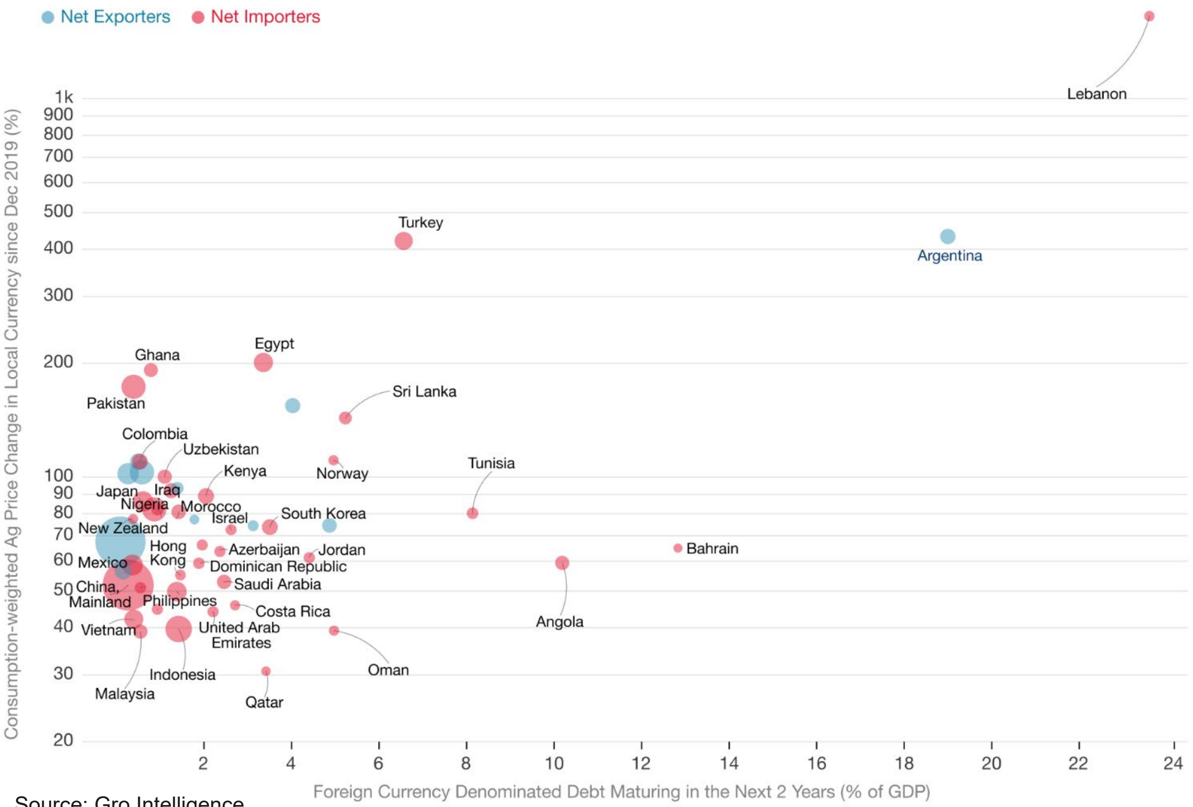
Imported Wheat Prices - Egypt

Source: Gro Intelligence

High Food Prices, Strong USD, & High Levels of Foreign Currency Denominated Short -Term Debt

- A stronger dollar has made foreign currency denominated debt even more expensive to pay off.
- This leaves countries with high short term foreign currency denominated debt-to-GDP ratios high agricultural price inflation, and high food expenditures relative to total expenditure most vulnerable to not just food insecurity, but also political instability.

Consumption-Weighted Ag Price Change vs Foreign Currency Debt

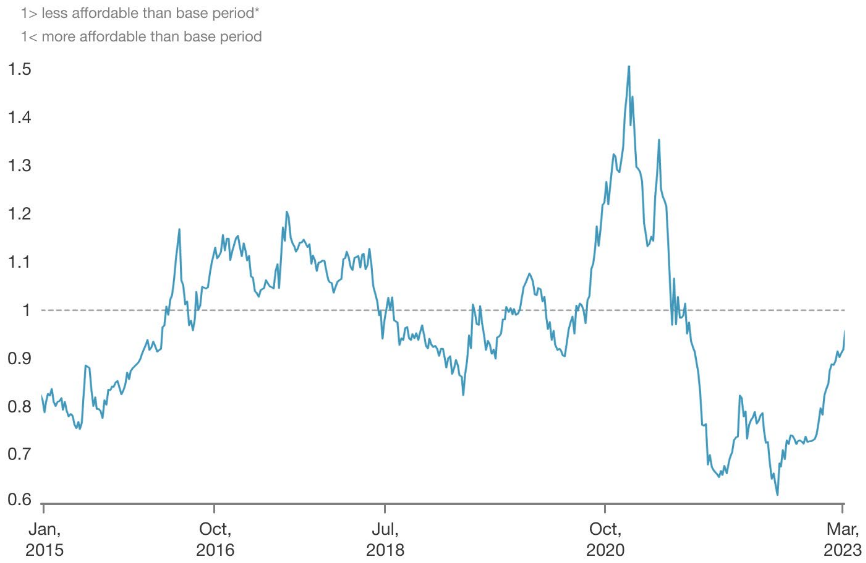


Source: Gro Intelligence

Fertilizer Prices Continue to Decline

Gro's US Fertilizer Affordability Index, which evaluates the relationship between input costs and crop prices, has bounced off the record low readings for affordability from mid -2022. **Gro expects consumption of all macronutrients in 2023 to increase from last season as a result.**

Gro's US N-P-K Fertilizer Affordability Index, Retail Prices



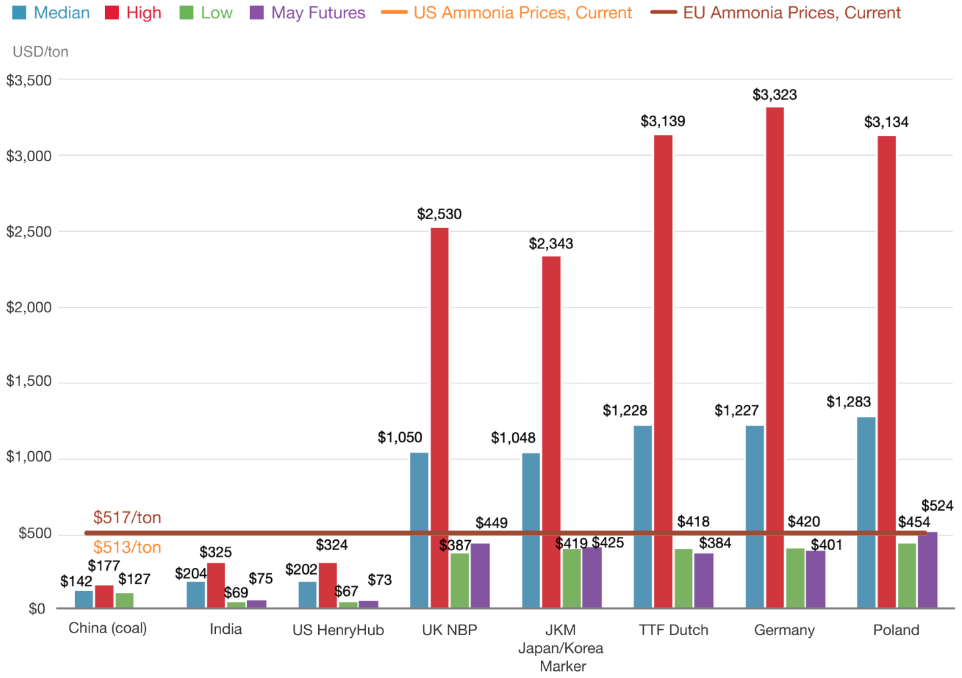
*Base period = 2016-22 fertilizer year average

Source: Gro Intelligence

Fertilizer Product Costs and Plant Capacity Improving

- In 2022, the cost to produce nitrogen fertilizer in the UK, EU, Japanese, and Korean markets exceeded the physical spot fertilizer prices, causing plant shutdowns.
- Production costs have improved in those regions and plants are recovering. **European plants are on average operating at 70% capacity, up from January estimates at around 55% and lows of 30% from last summer.**

Natural Gas Share of Cost per Ton of Ammonia Fertilizer and Retail Prices of Ammonia (June-March 2022/23, and May Futures)



*This chart does not take into account production costs other than natural gas, which makes up 70-90% of the cost

Source: Gro Intelligence

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[1] Europe: Title Transfer Facility
[2] Japan/Korea: Japan Korea Marker

Market Positioning

Speculators are short wheat and bean oil, but long soybeans and soybean meal. On the other-hand, producers are very short soybeans, soy meal, and bean oil.

Trading Accounts	Corn	Soy	Chicago Wheat	Soy Meal	Bean Oil
Man. Mon. Net Pos., Fut+Opt	-0.8%	11.2%	-20.1%	20.6%	-2.5%
Other Rep. Net Pos., Fut+Opt	2.8%	2.8%	5.5%	2.3%	0.5%
Non-rep. Net Pos., Fut+Opt	-3.6%	-3.9%	0.3%	3.9%	0.0%
Prod. and Merch. Net Pos., Fut+Opt	-12.2%	-20.3%	0.3%	-45.4%	-19.3%
Swap Dealer Net Pos., Fut+Opt	13.7%	10.2%	14.1%	18.6%	21.2%

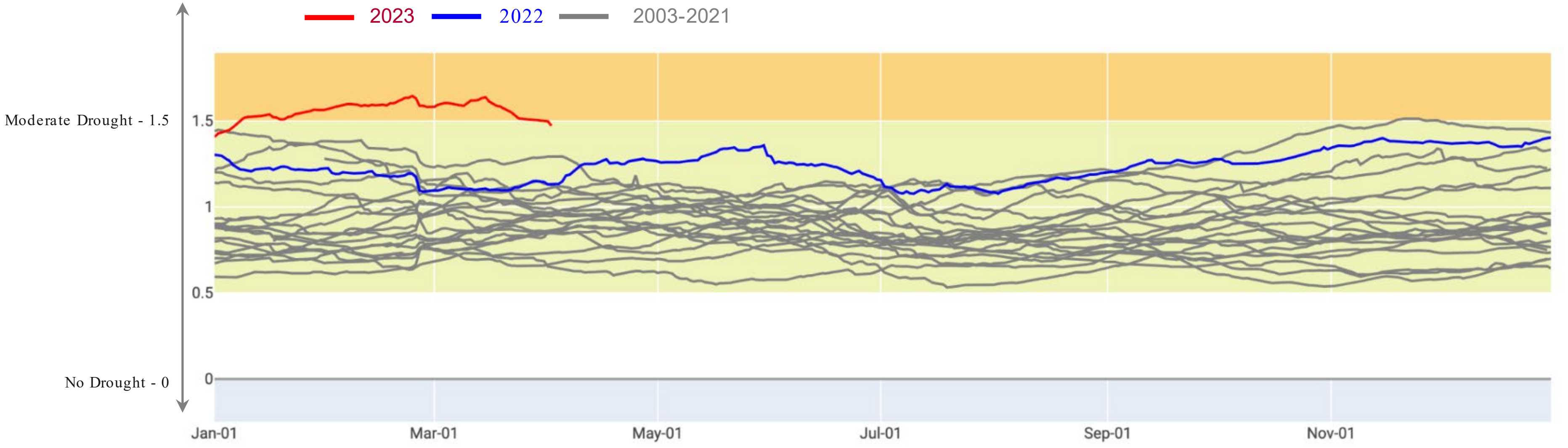
Source: CFTC

Supply

A Critical Moment for World Wheat Production…

Over 75% of world wheat production is currently planted and growing. Drought in wheat -growing areas is at over a 20 year high across in-season wheat-growing regions, according to Gro's Drought Index.

Gro Drought Index - Currently Growing Wheat Regions (*US, China, India, Ukraine, Azerbaijan, Uzbekistan, Tunisia, Syria, Serbia, Rusia, Pakistan, Nepal, Mexico, Iraq, Ethiopia, Belarus, Bangladesh, Afghanistan, Saudi Arabia, Iran, Turkey, Egypt, Algeria, Morocco, EU*-28) Weighted by Wheat

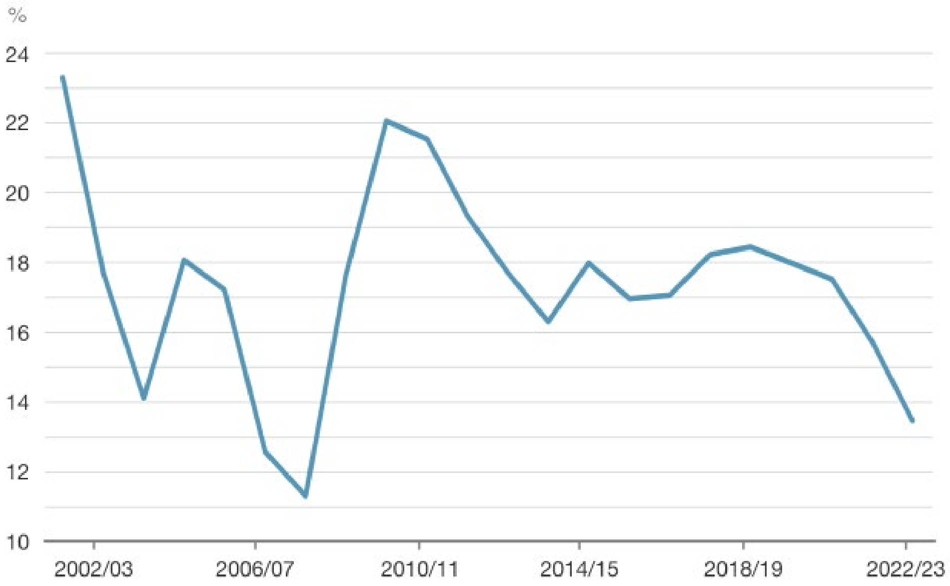


Source: Gro Drought Index, Gro Intelligence

At a Time When Global Wheat Inventories are Still Very Tight

- Major wheat exporter stocks are at their tightest level since 2008 when measured as a percentage of annual demand.
- Major Exporters of Wheat: Argentina, Australia, Canada, EU, India, Russia, Ukraine, US.
- Planted area in Ukraine is down 20% year on year.

Major Wheat Exporter Stock-to-Use Ratio

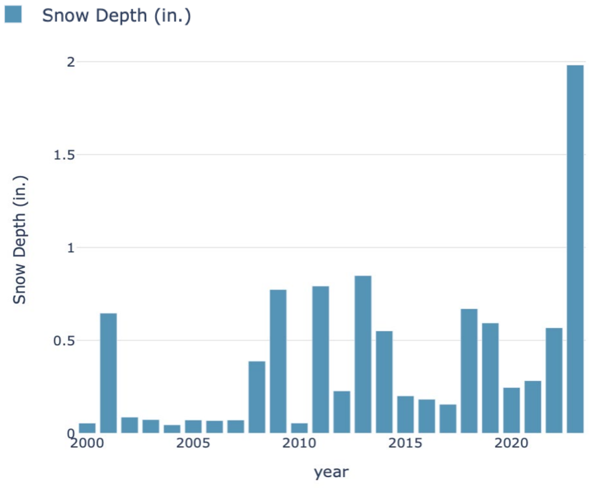


Source: USDA PS&D, Gro Intelligence

Snow Depth to Delay Corn Planting in the US

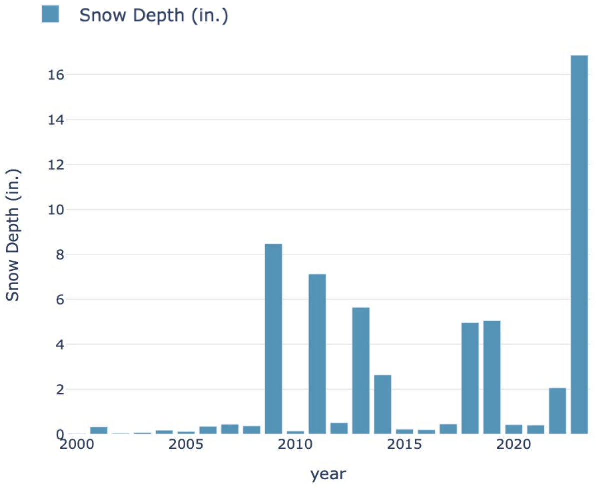
Corn-growing regions across the US, especially in the Northern Plains (North and South Dakota) are experiencing the highest snow levels in over 20 years. This will delay corn planting and risk prevent plant issues emerging.

United States: Corn Area-Weighted Snow Depth as of Mar 31



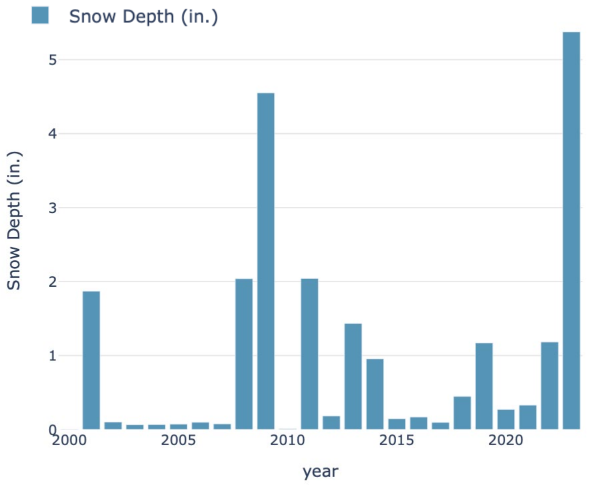
Source: Gro Intelligence, GHCN

North Dakota: Corn Area-Weighted Snow Depth as of Mar 31



Source: Gro Intelligence, GHCN

South Dakota: Corn Area-Weighted Snow Depth as of Mar 31



Source: Gro Intelligence, GHCN

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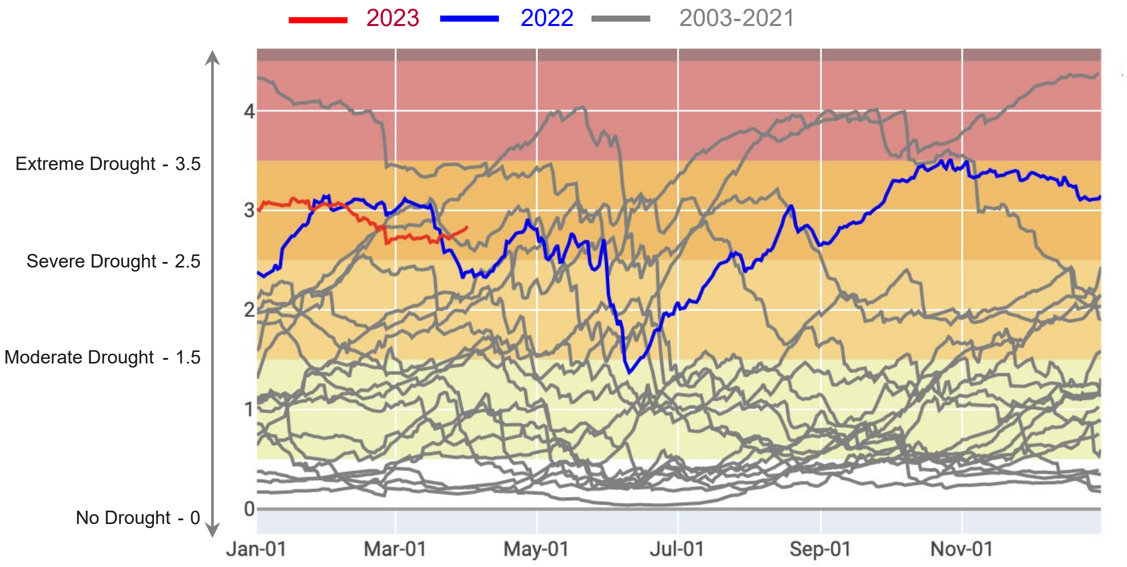
US Southern Plains Drought to Impact Winter Wheat Yield

- Severe drought is impacting the US Southern plains for a second consecutive year. This has led to poor pasture conditions, which is important for the cattle industry. In Texas, only 12% of pasture is in good-to-excellent condition.
- Gro's Hard Red Winter Wheat Yield Forecast Model points to **yields as poor as last season, a 15-year low.**
- National winter wheat **good-to-excellent conditions are also currently 2% below last year.**

Gro Drought Index - US Southern Plains (Texas, Oklahoma, Kansas) Weighted by NASS Winter Wheat



Source: Gro Drought Index, Gro Intelligence

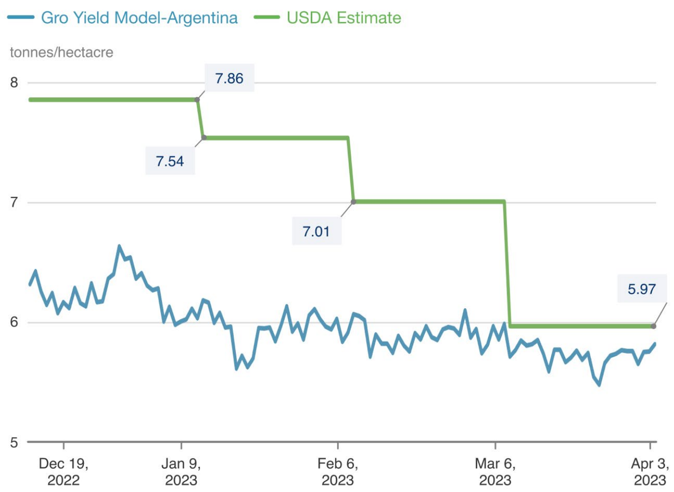
Drought in Argentina Poses Threat to Corn and Soybeans

Drought conditions in corn-growing areas in Argentina were at record drought in more than two decades earlier this year. Soybeans are also being impacted by drought. **Gro's machine learning-based yield forecast models' latest projections are low for both Argentina corn (5.83± 0.35 t/ha) and soybeans (2.21± 0.11 t/ha) as of 4/3.**

Argentina Soybean Yield Data - Gro Forecasts Compared to USDA

Source: Gro Intelligence, USDA

Argentina Corn Yield Data - Gro Forecasts Compared to USDA

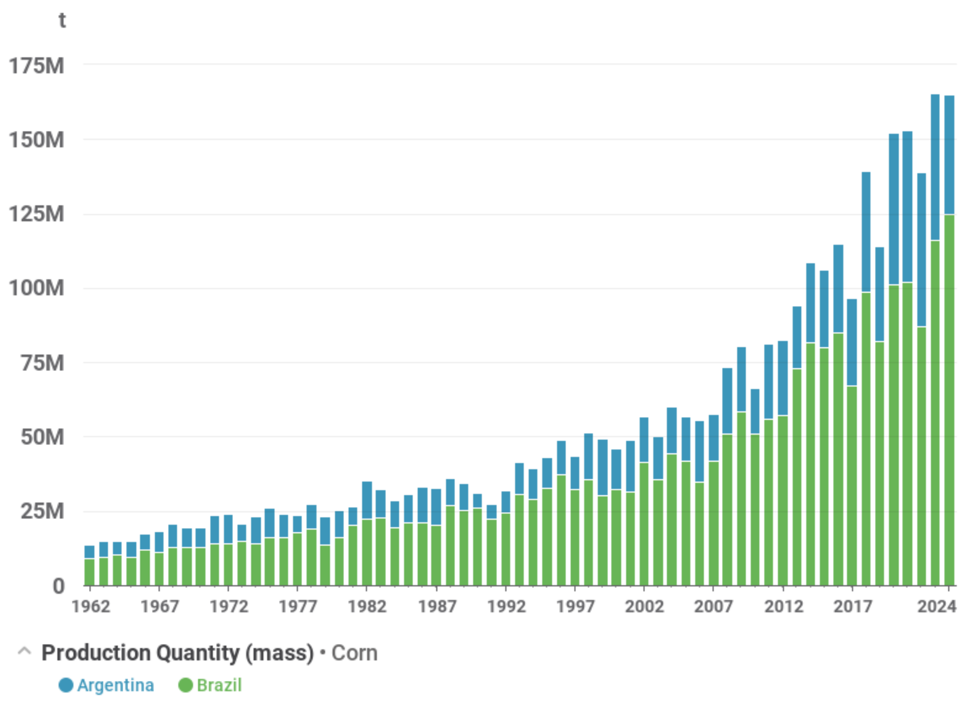


Source: Gro Intelligence, USDA

Strong Corn Production in Brazil Balances Poor Production in Argentina

- **Brazil is expected to produce another record corn crop this season**, supported by an increase in planted area. Gro's machine learning-based Brazil Corn Yield Forecast Model which updates daily at the district level is currently projecting yields at **5.72 ± 0.33 t/ha** (as of 4/4) up from last year's final projection of 5.34 ± 0.27 t/ha.
- **This helps balance out Argentina's drop in corn production**, which is suffering from drought hitting its biggest corn-producing regions.

Brazil and Argentina Corn Production

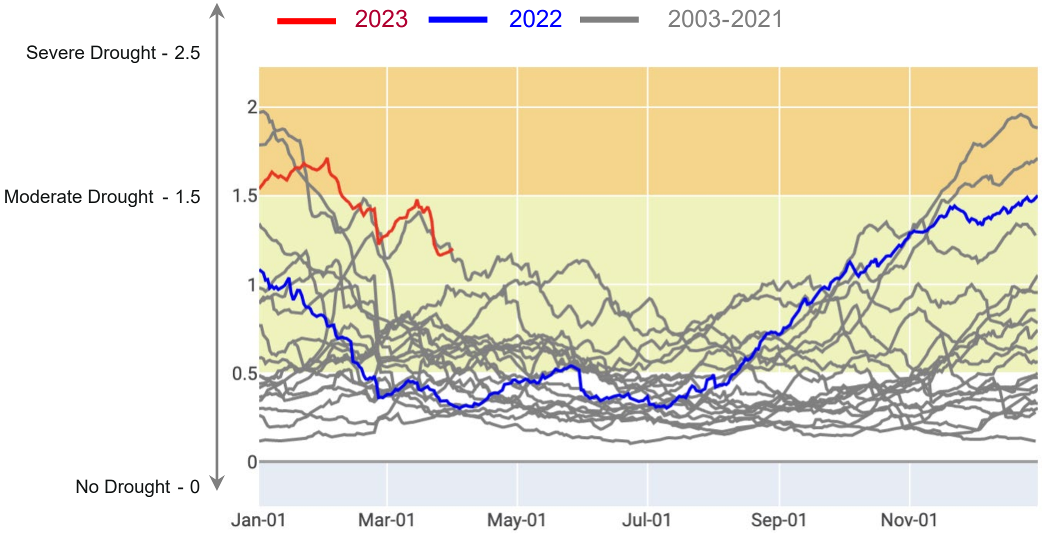


Source: Gro Intelligence, USDA PS&D

Drought in China is Affecting Rice and Wheat

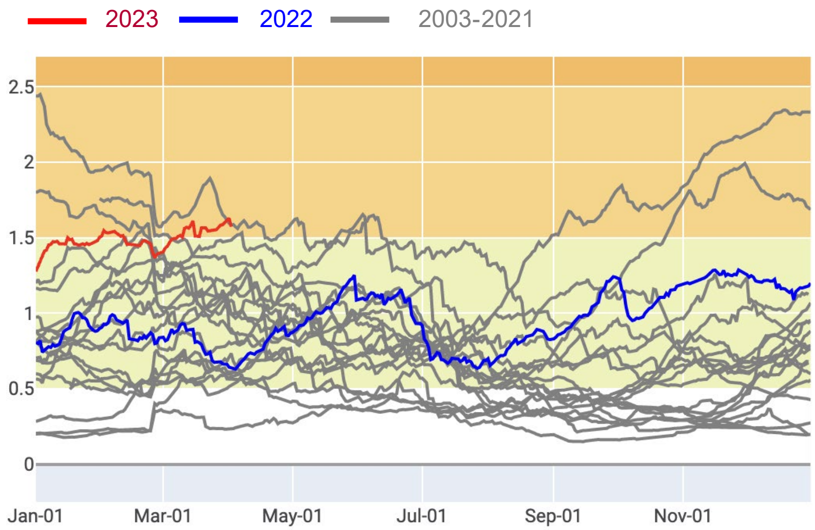
China, the largest rice and wheat producer in the world, is **currently experiencing the highest level of drought in both rice- and wheat-growing areas during this time of the planting season**in over two decades. Growing conditions in China's rice and wheat growing areas are becoming increasingly important, as China becomes more reliant on global grain imports.

Gro Drought Index - China (mainland) Weighted by Rice



Source: Gro Drought Index, Gro Intelligence

Gro Drought Index - China (mainland) Weighted by Wheat



Source: Gro Drought Index, Gro Intelligence

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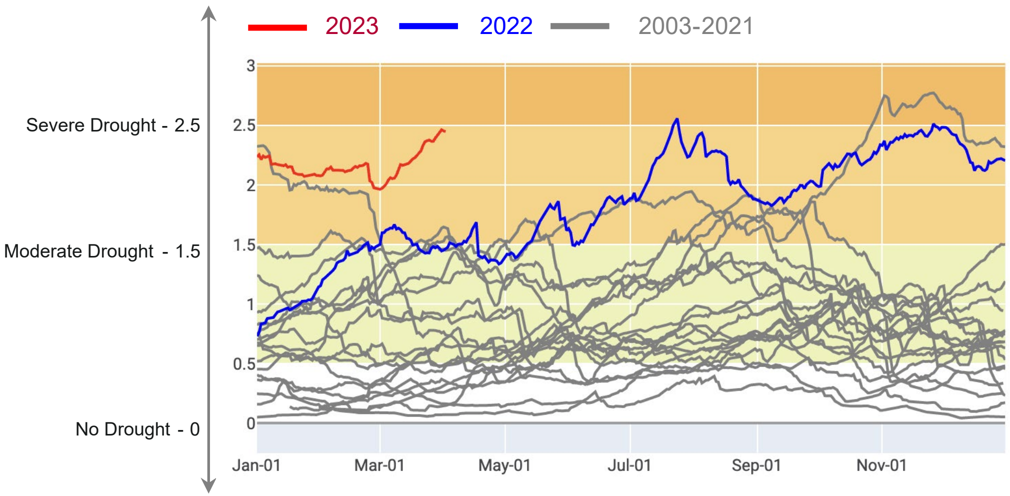
Drought in Europe is Affecting Rice and Wheat

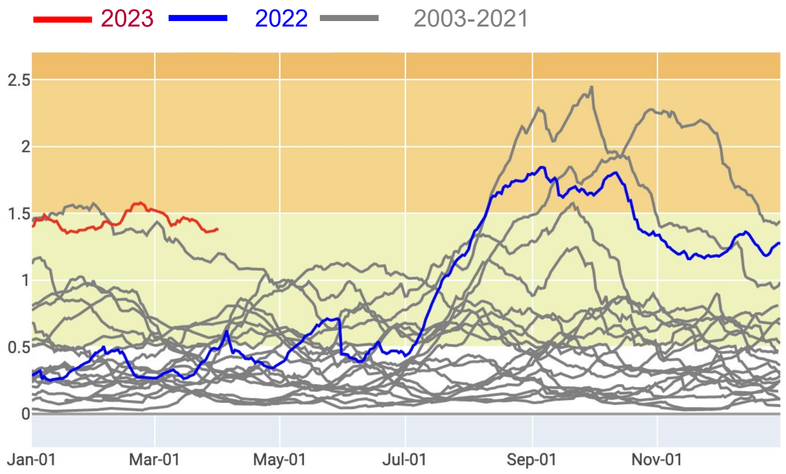
Major wheat and rice-growing countries in Europe, including **France, Germany, the UK, and Poland are experiencing the highest level of drought this time of year in 20 years.** This threatens an already tight global wheat supply at a time when the wheat crop is currently coming out of dormancy.

Gro Drought Index - EU-28 Weighted by Rice



Source: Gro Drought Index, Gro Intelligence

Gro Drought Index - France, Germany, UK, Poland Weighted by Wheat

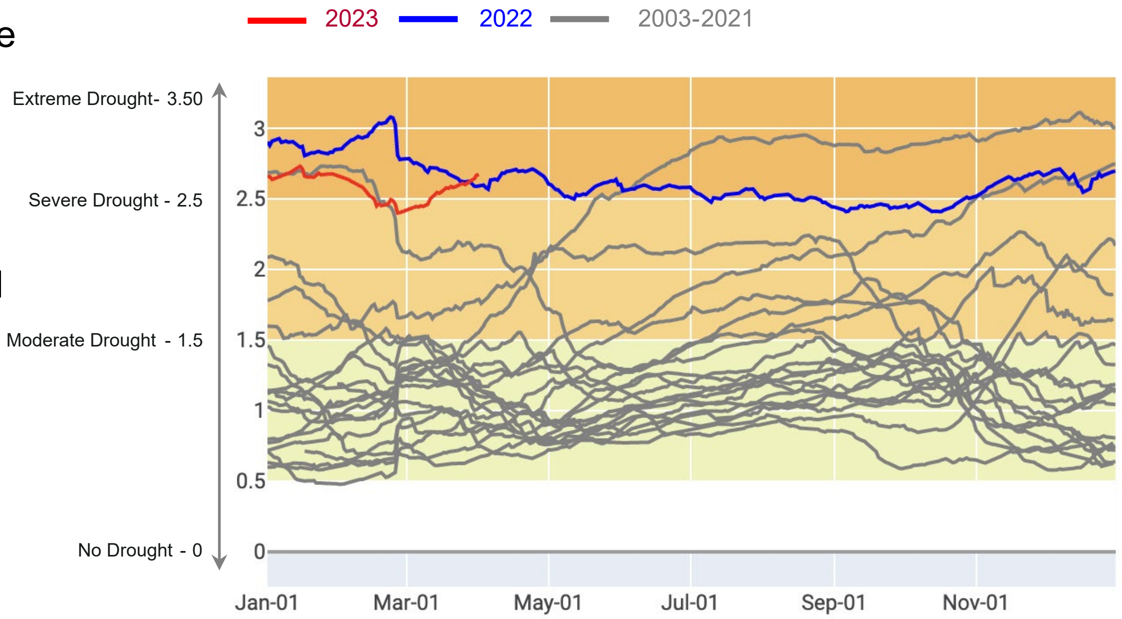


Source: Gro Drought Index, Gro Intelligence

Severe Drought in MENA Impacts Wheat Production

- The MENA region is experiencing the severest level of drought this time of year in over 20 years.
- Northern Africa is experiencing its second consecutive major drought and fourth in the last 5 years that will severely affect wheat production.
- These countries have historically relied on wheat imports from the Black Sea Region.
- **Another year of record imports will be needed to meet demands.**

Gro Drought Index - MENA Region (Syria, Lebanon, Iraq, Iran, Tunisia, Morocco, Libya, Algeria, Saudi Arabia, & Egypt) Weighted by Wheat



Source: Gro Drought Index, Gro Intelligence

Demand

Structural Shifts in Global Grain Demand - China

China Grain Imports

Crop Year* *Thousands of MT*	2017/18	2018/19	2019/20	2020/21	2021/22	2021/22 Feb 22	2022/23 Feb 23
Corn	3,455	4,483	7,596	29,556	21,886	1,930	3,086
Wheat	3,052	2,612	7,004	9,861	8,718	676	1,507
Sorghum	4,435	652	3,709	8,669	10,991	462	122
Barley	8,145	5,180	5,969	12,050	8,281	481	463
Rice	2,793	1,699	2,461	4,813	6,398	549	355
Total *(MT)*	**21,879,352**	**14,625,514**	**26,739,597**	**64,948,098**	**56,274,099**	**4,098**	**5,533**
Change in volume %	*-8%*	*-33%*	*+83%*	*+143%*	*-13%*		*+35%*

Note: Crop year runs from September to September. Crop year 2022/23 ends in September.

China exploded as the world's leading grain importer in 2020/21.

While COVID lockdowns didn't initially impact imports and demand, a slowing economy in the second half of 2022 led to significant reduction of imports relative to the prior year, but still close to record highs.

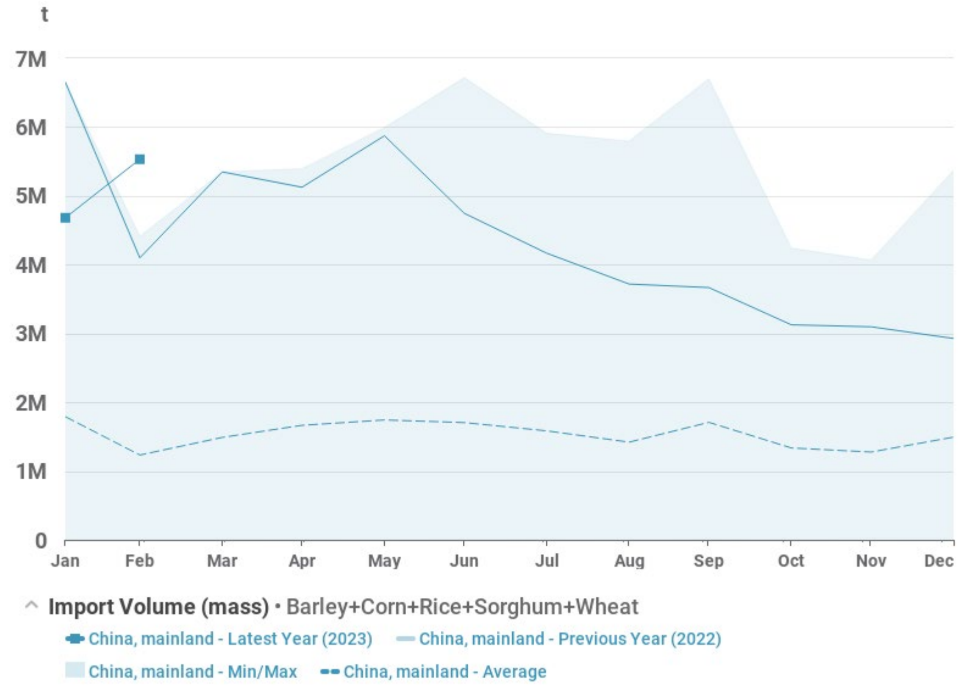
China is set to be a major structural grain importer for years to come.

Source: Gro Intelligence

China is at Record Import Levels of Grain

- China **has imported a record amount of grain this past February.**
- This jump in imports is being mainly driven by wheat and corn which have increased 123% and 60% y/y respectively.

China Monthly Grain (Corn, Rice, Sorghum, Wheat, Barley) Imports



Source: Gro Intelligence

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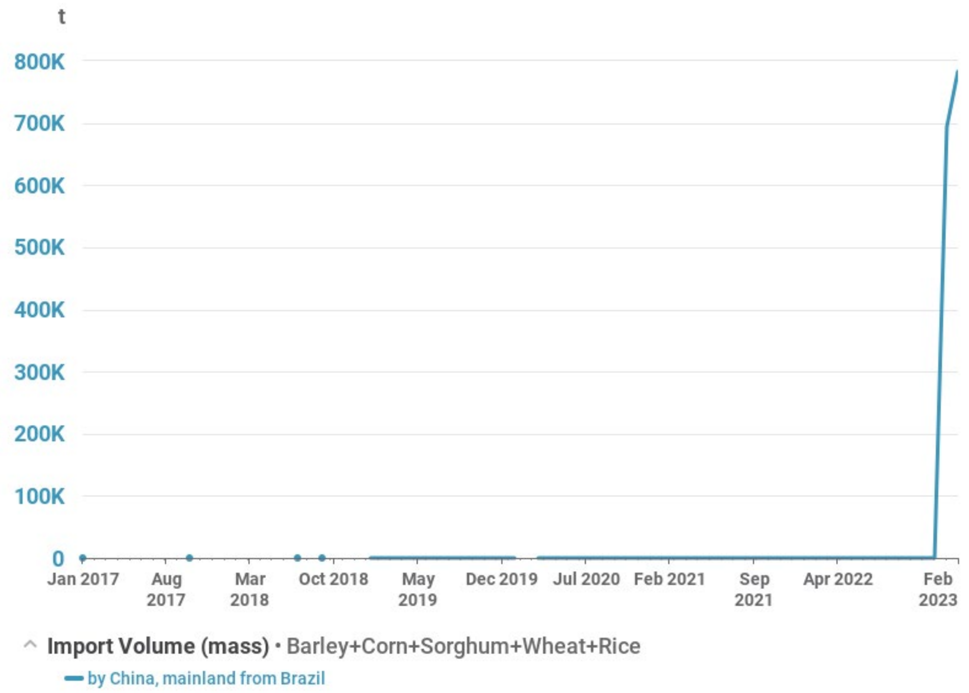
Brazil Corn Exports to China Surging

- **For the first time, Brazil contributed a double-digit share of corn shipments.**
- This is largely due to China opening its corn purchases to include Brazil last spring, which has only recently begun to take effect.
- As China diversifies its food purchases, it is likely to increasingly rely on Brazil to meet its growing grain import demand.

China Monthly Grain (Corn, Rice, Sorghum, Wheat, Barley) Imports From Brazil



Source: Gro Intelligence

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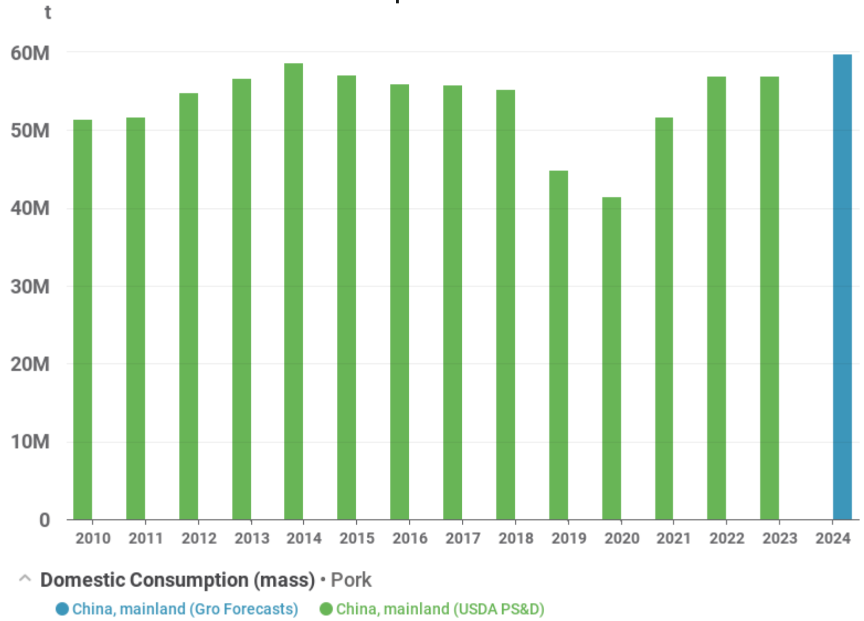
Gro's Pork Demand Model Forecast for China to Rise as Restrictions Lift

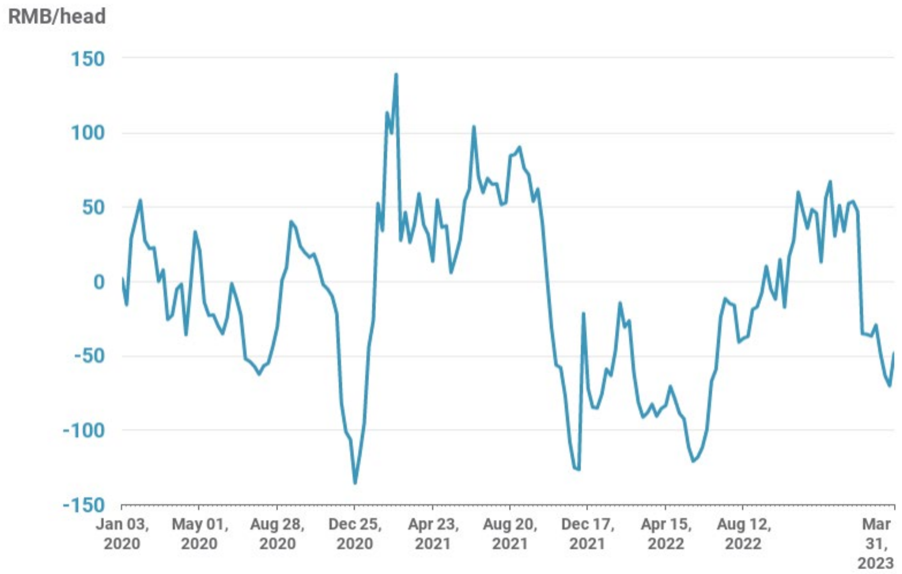
In January and February, Chinese pork consumption rose by more than 50% y/y as COVID restrictions were fully lifted. While such a fast growth rate isn't sustainable, Gro expects pork demand to increase y/y in 2023 and 2024. This is likely to lead to more grain and oilseed demand from China, as they are needed for animal feed.

China Annual Pork Consumption - Gro Model Forecast



Source: Gro Intelligence, USDA PS&D

China, Mainland Hog Producer Margin

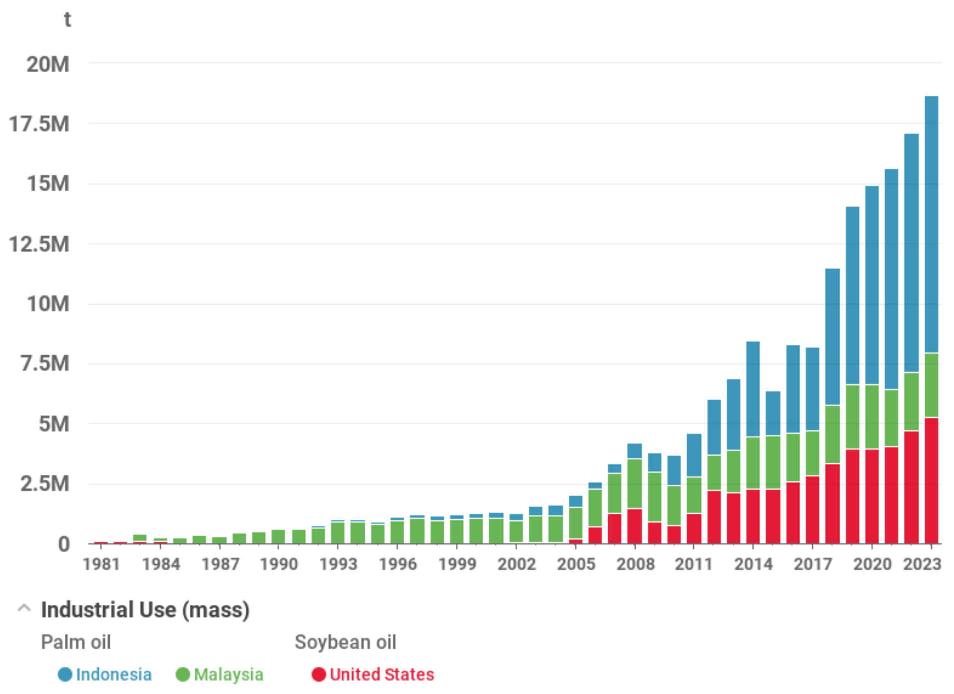


Source: Gro Intelligence, China Sources

Biofuel Demand Continues to Rise Sharply

Palm and soybean oil demand for industrial use continues to rise as biofuel demand increases, competing with vegetable oil for human consumption. It will also increase competition for limited or protected arable land.

Palm Oil and Soybean Industrial Use



Source: Gro Intelligence, USDA PS&D

A Volatile Year (or More) Ahead..

- Food inflation continues to be a problem, especially given high interest rates and a strong dollar. These conditions make countries with high short term debt -to-GDP ratios, high agricultural price inflation, and high food expenditure relative to total consumption most vulnerable to not just food insecurity, but also political instability. This is particularly true for net importers.
- Fertilizer prices are coming off their highs and are expected to further improve as a result of declining wholesale and import prices.
- There are several threats to the supply of major grains due to severe weather conditions.
- The ending of lockdowns in China will be sure to accelerate demand changes and further tightening of global inventories.
- Brazil is likely to become a major grain exporter to China going forward.
- Climate shocks will persist and continue to increase uncertainty.

Closing and Questions

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