

2022

THE STATE OF AGRICULTURE

AN FBN® RESEARCH SPECIAL REPORT
10 MARCH 2022



FARMERS
BUSINESS NETWORK®

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ABOUT FARMERS BUSINESS NETWORK

It's 2022, and at **Farmers Business Network** we are wholeheartedly committed to putting **Farmers First**. We help family farmers maximize profit potential with a game-changing, direct-to-farm commerce, crop marketing, and sustainability platform - enhanced by transparent insights and a peer community that redefines value and convenience. By working with farmers, we've analyzed 350 million acre-events of real-world data contributed by FBN members. Then we enrich that anonymized data with analytics and data science to return transparent, farm-tested insights back to our members, helping them make knowledgeable decisions that can reduce their cost of production and maximize their profit potential.

We're Farmers Business Network because we enhance the power of the 36,000+ members that make up our growing global farmer network for the benefit of every farmer's business through insights, commerce, and community. At Farmers Business Network, we know it's challenging for farmers to feel in control in their highly unpredictable world where unrelenting hard work doesn't guarantee they can make a good living. We understand the farming system lacks transparency and competition, and is inherently stacked against them, leaving many feeling concerned about the future of their farms and rural communities.

Farmers Business Network is on a mission to power the prosperity of every family farmer. This report is a direct expression of our mission to work together with farmers and bring more transparency to agriculture, providing farmers with information they can use to make knowledgeable decisions for their operations.





FARMER TAKEAWAYS

- **Grain Markets Will Smash Record Highs in 2022.** Robust global and US demand coupled with droughts across international growing areas have helped double farm grain prices in the past 18 months. The Russian invasion of Ukraine on Feb 24th set off unprecedented shocks to commodity and energy markets that will take months, if not years, to resolve. Russia's economic banishment from global markets, on top of Ukraine's fight for survival, will keep much needed grain and energy products out of global pipelines, forcing markets to search for a sharply higher price equilibrium. The impacts will be felt on a world scale as food inflation accelerates, and lesser developed countries face food security risks.
- **U.S. Acreage Shifts Not Likely to Derail Price Strength.** Every acre matters for global grain markets with near record high prices. Big gains in fertilizer costs and strong prices from a wide array of farm commodities could drop corn acres and increase soybean acres. These are second-order effects in a year when the world will be reeling from lost exports out of the crucial Black Sea regions.
- **Biofuels Provides Short- and Long-Game to Agriculture Growth.** US biofuel policies have pivoted of late, giving a big runway for renewable diesel growth and setting off big investments in new soybean processing capacity. A sharp escalation in energy prices over the near-term likely supports ethanol processing after multiple years of losses.
- **Farmers Face Rising Costs and Limited Profit Growth.** Fertilizer and chemical costs have increased rapidly since Sep 2021 and show few signs of retreating for the 2022 growing season. While farm profitability should be up from the lows seen in 2016-2018, most farmers report they are not likely to make big investments in large machinery over the next 12 months, suggesting risk aversion to widespread cost inflation and interest rate hikes likely to come.



BLACK SWAN FACTORS SHAPING 2022

While only a few months into 2022, several Black Swan events are shaping the economic climate for agriculture. Some of these exogenous shocks like the COVID pandemic and supply-constrained inflation have been in play for a while. But the unforeseen military action in Eastern Europe involving pivotal agricultural countries sets up enormous risk to the agricultural landscape and fundamentally alters the calculus of global commodity trade.

- **COVID-19 and Supply Chain Constraints.** Two years after the global COVID-19 pandemic started, labor and supply chain issues still persist. This has led to a strong surge in agricultural chemical and fertilizer prices over the last six months. Rising energy costs, US and China production facility outages, and transportation bottlenecks have driven farm input costs higher for 2022 and have made it challenging for farmers to source necessary crop inputs. We see no change to these conditions in the near-term to fundamentally reduce farm input costs for the 2022 growing season.



- **Historic Consumer and Commodity Price Inflation.** US consumers are seeing the highest food price inflation rates in over 40 years, driven in part by supply constraints but also fueled by a firehouse of US government fiscal stimulus. In agricultural markets, key crop prices have been on an upward trajectory over the past 18 months as robust raw commodity demand coupled with drought-induced supply shortfalls across key global suppliers have created a favorable price environment for farmers heading into 2022.
- **War Outbreak in Crucial Commodity Region.** Russia stunned the world by invading Ukraine on February 24th and created immeasurable uncertainty for agriculture and energy markets. For agriculture, these countries account for 13% of global wheat production but nearly 30% of international wheat trade. The Black Sea region, which lies at the epicenter of the military conflict, is a critical trade area that has already seen disruptions to physical commodity trade. A quick resolution to the war seems unlikely and a protracted military conflict that pushes into summer 2022 could fuel much higher global grain prices from a diminished Black Sea export arena.



Photo by Fotoreserg. Used by permission
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WAR IN THE WORLD'S BREADBASKET

Russia's military invasion into Ukraine on February 24th set off one of the biggest global shocks felt in modern history. Two major countries locked in a fierce military engagement, combined with crippling global financial sanctions have created spiraling risk for markets and the world order for years to come. For agriculture, these two countries are crucial suppliers to global grain markets, and the Black Sea region with its key port terminals in southern Ukraine serves as a crucial shipping route to Europe, Africa and Asia. The most immediate concern for agricultural markets is the disruption of trade. But a protracted engagement into summer 2022 will add even greater threats to the production of fresh grain supplies.

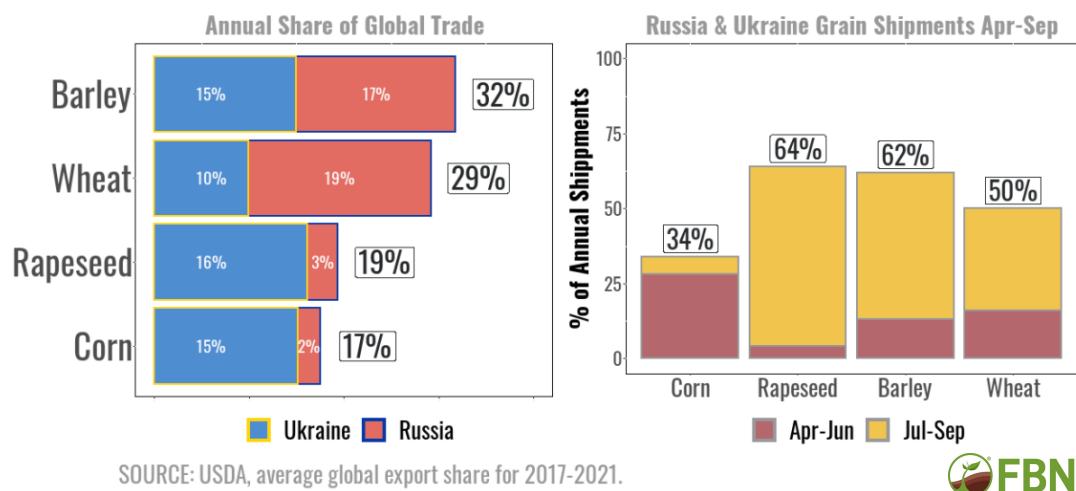
Near-Term Trade Disruptions

Immediately following the invasion, trade in the Black Sea region came to an abrupt halt. Ports were shuttered, international grain trade companies immediately ceased

operations, and other global trade zones like the US and Europe saw grain prices quickly skyrocket. The combined size of Russia and Ukraine's export volumes are significant – as much as 30% of global wheat & barley, and 15-20% of global corn & rapeseed (canola). In the 2021 calendar year, the region's combined wheat exports were valued at \$13.8 billion. The prospect of losing these commodities into the global pipeline has put world grain markets and international end-buyers on edge.

Global Grain Trade Risk from War Disruptions

War-torn Ukraine and a restricted Russia are significant suppliers for world trade. The most immediate impact is corn trade in Apr-Jun, but bigger wheat impacts into summer.



The most serious short-term risks and disruptions are to the corn trade, where Ukraine is a major supplier at this time of year and into the Apr-Jun time period. Indeed, shortly after the invasion South Korean feed manufacturers who had bought sizable corn from Ukraine for future shipment were tendering for grain out of alternative regions, including the US. Looking into summer, new supplies of wheat from Russia and Ukraine quickly find their way into export channels and given the two country's size of global trade, any reductions in wheat flows could create a super-charged price environment. Although global wheat prices are and will continue to be on edge, it is important to note that US wheat prices are currently well above European values to be delivered into key markets of Europe and Africa. For instance, in a recent global tender for a top importer - Egypt - US offers were around \$85 per tonne higher than French-origin offers. As such, there likely will be a recalibration of global prices across supplier countries to adjust to a trade ecosystem void of the top two wheat exporting countries.

Russia & Ukraine's Top Destinations for Exports

	Russia Top Destinations	Ukraine Top Destinations
WHEAT	Egypt, Turkey, Bangladesh, Pakistan, Azerbaijan, EU, Sudan, Nigeria, Yemen	Indonesia, Egypt, Pakistan, Bangladesh, Morocco, Turkey
CORN	Turkey, South Korea	China, EU, Egypt, Iran, South Korea
BARLEY	Saudi Arabia, Tunisia, Turkey	China, Saudi Arabia, Libya, Turkey
RAPESEED	China, Belarus	EU

Source: Global Trade Tracker, countries denoted in orange text are also supplied by the US and could readily switch to US commodities to fill lost volumes from Russia/Ukraine.

Exports to date are mixed for Russia and Ukraine. Ukraine had a massive grain harvest in 2021 and thus has had exceptionally strong exports. However, Russia did not have (relatively) as good of a production season. Its exports are lagging the previous crop year's volumes at the same time of year. USDA's marketing-year export forecasts from February 9th now seem unattainable and international buyers will start using alternative countries for their needs.

Russia & Ukraine' Exports to Date vs. USDA's Annual Forecast (in million metric tons)

	RUSSIA		UKRAINE	
	Through Feb-24	USDA Annual	Through Feb-24	USDA Annual
WHEAT	22.5	35.0	17.8	24.0
CORN	1.7	4.5	18.7	33.5
BARLEY	3.9	4.5	5.6	6.0
RAPESEED	0.1	0.5	2.6	2.7

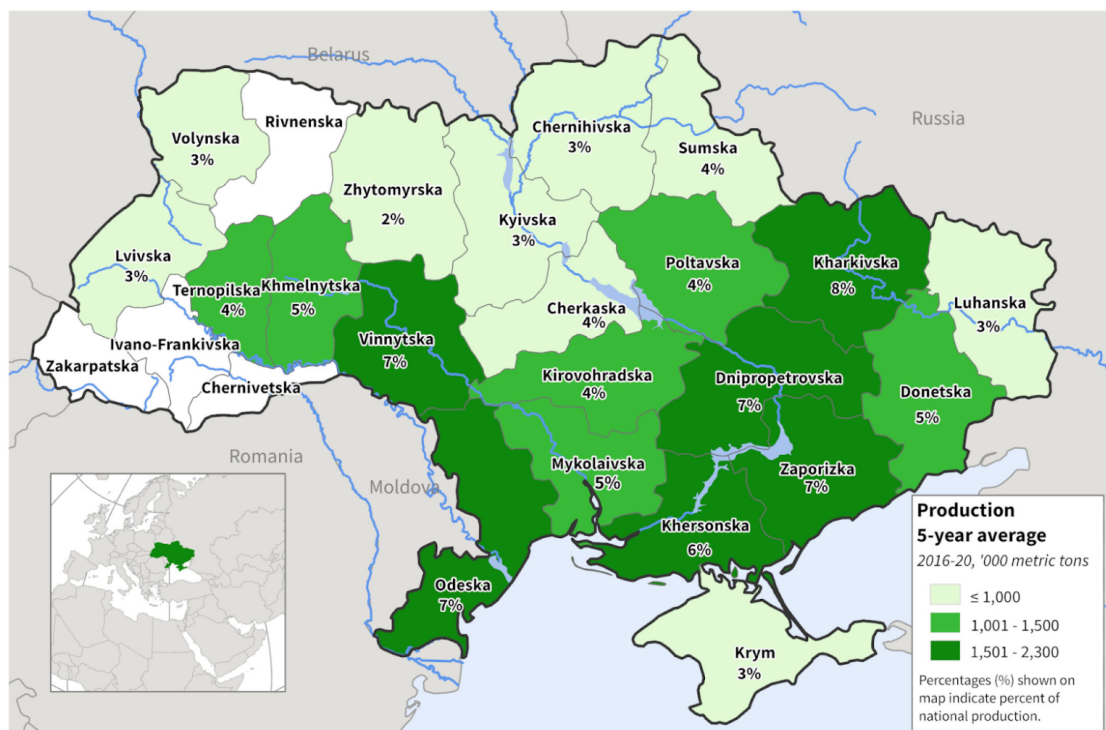
Source: Russian Ag Ministry, Ukraine's State Fiscal Service, USDA
Wheat, barley, rapeseed crop years run July 1-June 30; corn crop year is Oct 1 - Sep 30.

Long-term war could be dire for prices and global stability

A drawn-out military conflict and deepening banishment of Russia from international markets will likely have far reaching consequences for grain markets. Along with potential trade flows being lost, there is a risk that new crop supplies in Ukraine and Russia will be threatened as well.

Farmers in Ukraine have planted their winter wheat crop this past fall, and in the spring begin planting other key crops. Much of the fighting today is in Northern and Eastern stretches of the country, whereas key growing areas are more towards the south. It is challenging to predict how big an impact there could be to farmers and the potential to grow and ship crops in the upcoming season. The constraint of logistics to acquire farm inputs and transport farm commodities will be a critical one. Like US farmers, Ukraine's farmers rely on a well functioning economic system of banks, input suppliers, farm labor and transportation to bring crops to life. And with the start of the planting season in late March, it seems the underlying plumbing that farmers rely on will be corroded at best, if not completely broken.

Ukraine Wheat Production





Russia's farmers face a different, but not altogether unchallenged farming environment. The tsunami of financial sanctions have caused Russia's economy to crater. Inflation will increase rapidly, the Russian ruble has fallen to never-seen lows and internal banking and economic systems will also be challenged to support Russian businesses, including farmers. With hyper-inflation likely to be on the horizon, at best this keeps Russian farmers from selling grain supplies, but instead holding physical commodities as a hedge and trying to capture values based on US dollars and Euro currencies. It seems unlikely they are as constrained this spring as Ukraine's farmers in a war-sieged countryside, but time will tell how much this could impact their ability to plant and grow crops that the world has grown accustomed to.

Finally, there are important and unambiguous spillover effects on the world's consumers from protracted disruptions to these key grain countries. Feed grain and wheat prices will push inexplicably higher from already lofty values, making consumer staples like meat, bread and dairy products continue to rise beyond already inflated values. In the US, food price inflation topped 7% in February 2022, the highest annual figure in 40 years. For less developed countries where food scarcity is critical, there can be profound effects when food inflation rises sharply, one of which is an [increase in rioting and violent conflicts from citizens against governments in these countries](#).

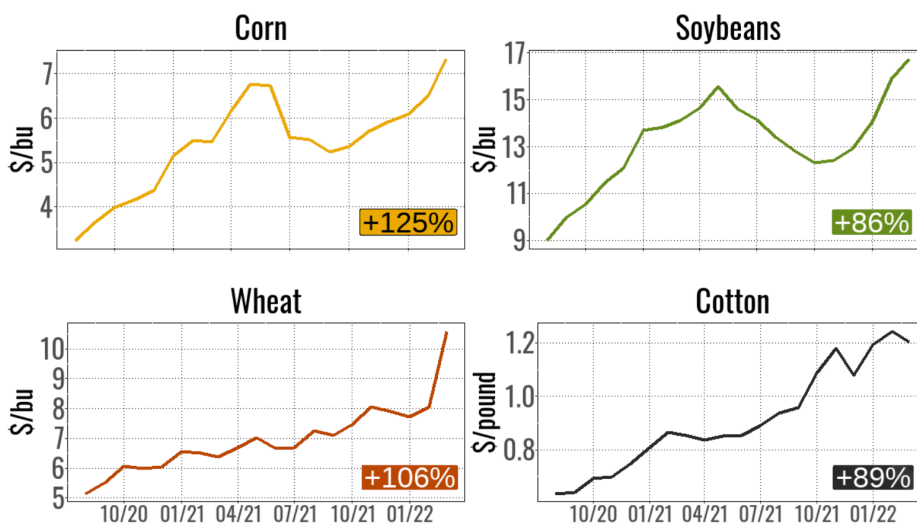


GRAIN MARKETS ON FIRE

The current farm economic environment is vastly different from the situation a few years ago. Over the past 18 months key agricultural crop prices have catapulted from injections of new demand, setbacks in key global production regions, and rising input costs. With some of the best prices farmers have seen in 7 years, we see few deflationary factors that will derail the prolonged bull run.

The Persistent Climb of Grain Prices

Since Aug-2018 grain prices have been advancing on drought-induced crop losses and demand growth



SOURCE: CME/MGEX/ICE monthly average nearby futures, updated 2022-03-03

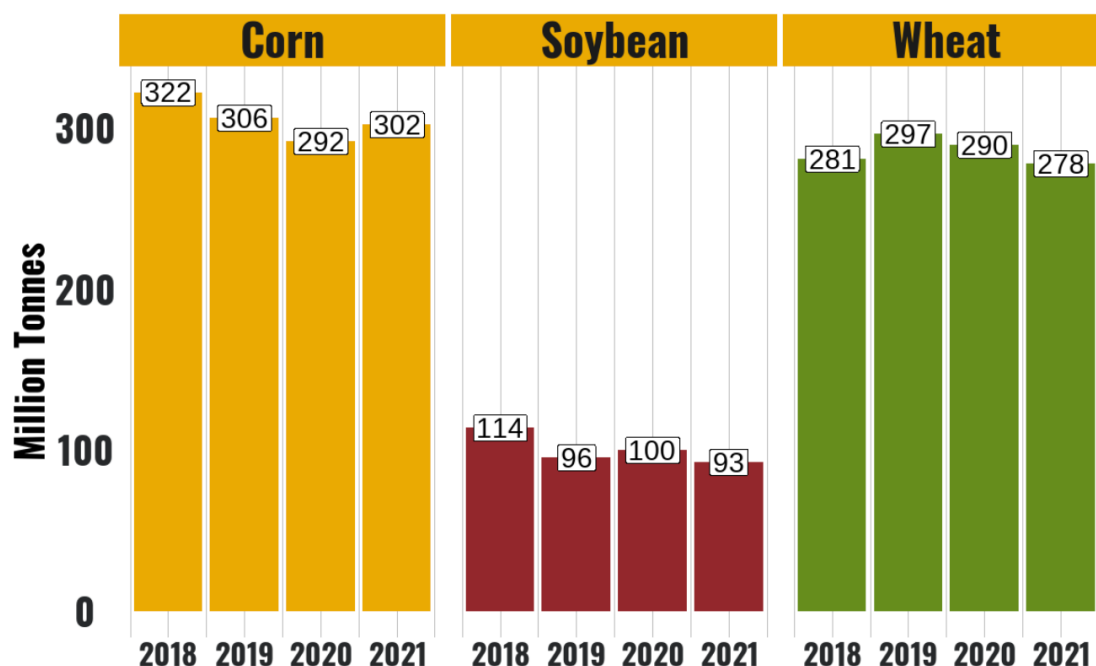


Key Factors Pushing Markets Higher

	Supply Factors	Demand Factors
2020	US corn crop suffers unexpected losses from drought and Iowa derecho wind event causing yields to fall sharply by 6 bushels to 172 bushels per acre.	China buys 750 million bushels of US corn in 3 months, surpassing the 620 million bushels of purchases made over the previous decade.
2021	Brazil's corn crop is down 15% while Canada has widespread losses of 30-50% across key crops from historic drought. Escalating fertilizer and chemical costs keep grain prices supported.	Ethanol prices jump on elevated gas prices, while US policies send strong signals for renewable diesel, adding support for future soybean usage.
2022	Brazil and Argentina likely see big losses to their soy crop, while corn remains at risk of below normal production. War in Black Sea region raises international trade concerns and potential crop losses, especially if military engagement extends into summer 2022.	Sharply higher grain and oilseed prices do little to dissuade international or domestic users, suggesting a robust demand environment.

Global stocks have moved lower in recent years. Though USDA is pegging a turnaround in corn carryout for 2021, weather risks in South America's current growing season could change that picture. Corn and soybean yields are expected to be below trend in Brazil, Paraguay, and Argentina with the La Niña weather pattern largely to blame. Barley and rapeseed stocks are forecast to be at their lowest levels in well over a decade, and likewise wheat stocks are declining to their lowest level in several years. A quick rebuilding of stocks to higher levels seen in previous years seems unlikely, and likely takes several growing seasons in the Northern Hemisphere to break out of the tight stocks situation.

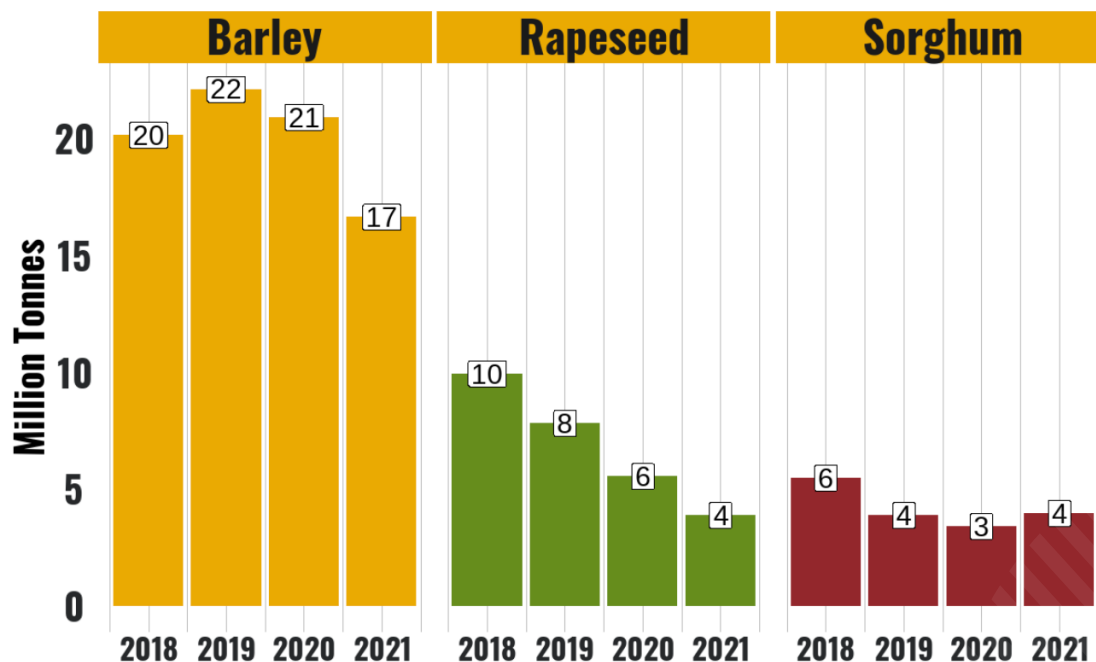
Global Ending Stocks - Corn, Soybean, Wheat



SOURCE: FBN/USDA
Chart generated on 03/02/2022



Global Ending Stocks - Barley, Rapeseed, Sorghum



SOURCE: FBN/USDA
Chart generated on 03/02/2022





CORN: Fertilizer Costs Limit Corn Acre Expansion

Skyrocketing fertilizer and chemical prices are making crop production more expensive but sharp increases in nitrogen-based fertilizer are having the most impact on corn costs. This could reduce farmers' appetite for corn production in 2022. The added fertilizer cost alone likely adds an extra \$0.50 to farmer's production costs and pushes farmers in marginal corn growing areas to choose other crops.

- FBN expects US corn acres to fall 2.9 million in 2022 as strong crop prices for other crops take marginal corn acres out of production.
- High feed prices limit domestic feed use; Black Sea disruptions and South America corn losses keep US exports strong and ethanol finds support from sharply higher gasoline values.
- We peg projected carryout to be near this year's tight stocks environment.

US Corn Balance Sheet (MB)

Items	2020/21	2021/22	2022/23 FBN Forecast
Planted	90.7	93.4	90.5
Yield	171.4	177.0	178.0
Total Supply	16,055	16,375	16,305
Feed	5,601	5,650	5,550
FSI	6,465	6,760	6,685
Ethanol	5,028	5,325	5,250
Domestic Use	12,066	12,410	12,235
Exports	2,753	2,425	2,450
Ending Stocks	1,236	1,540	1,620
Stocks to Use	8.3%	10.4%	11.0%

Source: FBN/USDA updated on Mar 3, 2022



Corn is a global commodity but dominated by a few countries with the US being a key player. Two of the world's top five exporters are Ukraine and Russia. China has emerged as a top importer with that trend starting in 2020, and we expect that trend to continue.

Corn: Top Five Countries for Each Category

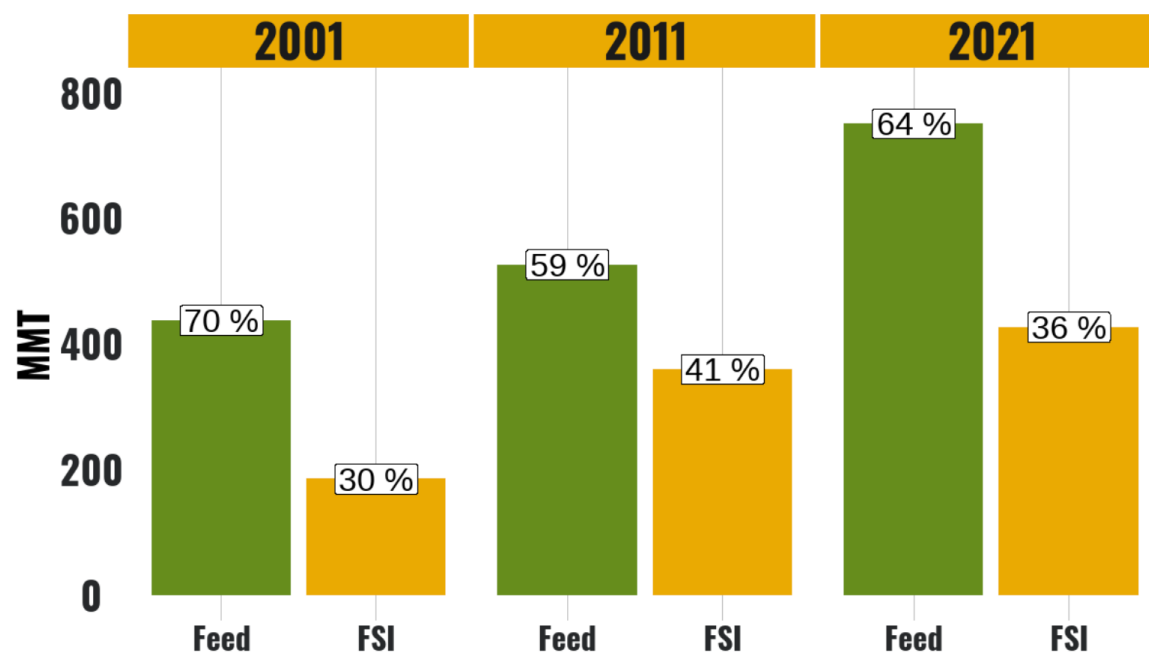
Producer	Exporter	Importer	User
US	US	China	US
China	Argentina	Mexico	China
Brazil	Ukraine	Japan	EU
EU	Brazil	EU	Brazil
Argentina	Russia	Vietnam	Mexico

Source: FBN/USDA, based on 2020/21 data

The majority of corn production goes to feeding livestock with second place being FSI (food, seed, and industrial use). FSI gained on feeding rates in the early 2000s when ethanol came into play, but that has since eased. Now, around two-thirds of global corn use is for feeding while about one third is for FSI. Biofuels are discussed in more depth, later in the report.

Global Corn Use Break Down

Corn Use Trend Over the Last 20 Years



Source: FBN/USDA
Chart generated on 03/02/2022



Key Points for the Global Corn Market

- **China:** The world's biggest commodity importer has now added corn to its shopping list. The once massive domestic corn inventories have been depleted and the country's farmers are unable to keep up with a massive feed demand.
- **Ukraine:** War in the Black Sea raises concerns about export volumes in the short run, longer run concerns are present about plantings in Ukraine. Ukraine has a strategic advantage in supplying China.
- **Canada:** Feed grain supplies exceptionally tight on the 2021 drought.
- **Brazil/Argentina:** Production cuts possible for Brazil's winter corn and Argentina's corn.



Bullish Factors	Bearish Factors
<ul style="list-style-type: none"> • Exportable surplus available • Competitive at the Gulf • China demand expected to remain strong • Lagging exports out of Black Sea • Drop in US acreage • In Nov/Dec, when acreage decisions are being made, corn prices were not as appealing 	<ul style="list-style-type: none"> • Larger Brazil winter corn crop • Argentina's weather has improved from earlier in the season • New-crop values have gained from where they were which may pull in some acreage • If Black Sea reopens, Ukraine will have supplies quickly hitting the market



PRICE OUTLOOK

Even before the Russia-Ukraine war, the outlook was supportive for higher corn prices. But this added catalyst likely puts corn prices on a path to fresh all-time highs well above \$8 on the futures market.

SOYBEANS: Brazil Losses & Biofuel Push Support Higher Acres

\$18 per bushel spot soybean futures are a likelihood as the 2021/22 crop year continues. Not since the 2012 US drought have soybean prices been this high. The primary driver of price strength is the situation in South America, but particularly southern Brazil, Paraguay and parts of Argentina. Expectations of soybean supplies from South America have been slashed 10%, setting off an explosive rally in soy prices from \$14 to \$16 in a few short months.



Key Facts About Brazil & the US Soybean Markets

Brazil	U.S.
<ul style="list-style-type: none"> • Has had record soybean plantings every year for many years • Largest soybean exporter • Largest soybean producer • China is top market • Can double crop beans then corn • Brazil exports much more than it crushes 	<ul style="list-style-type: none"> • Second largest exporter • Second largest producer • China is top market • Brazil has captured some US export share to China • US crush usually exceeds export volumes • US commonly hits new crush record every year

Production losses in South America now translate to additional export opportunities for the US in 2022/23. Brazil still is forecast to be the dominant soybean exporter to the world and to China, but the US is positioned to take up Brazil's slack later this calendar year and into early 2023. Market attention is starting to swing from Brazil to the US and acreage prospects. Higher expected US acreage could dampen price strength into harvest in 2022.

- FBN expects soy acres to expand, surpassing 90 million on high fertilizer prices moving acreage out of corn.
- A limited Brazil soy crop will play into strong US exports in the 2022 campaign. Soy crush will continue to expand on renewable diesel tailwinds, but is constrained by new capacity coming online quickly.
- Soy inventories inch higher but do little to curb lofty prices on global inflation and energy market strength.

US Soybean Balance Sheet (MB)

Items	2020/21	2021/22	2022/23 FBN Forecast
Planted	83.4	87.2	90.7
Yield	51.0	51.4	52.0
Total Supply	4,761	4,707	4,999
Crush	2,141	2,215	2,275
Exports	2,265	2,050	2,200
Total Use	4,505	4,382	4,610
Ending Stocks	256	325	389
Stocks to Use	5.7%	7.4%	8.4%

Source: FBN/USDA updated on Mar 3, 2022



Key Facts in the Soybean Markets

Bullish Factors	Bearish Factors
<ul style="list-style-type: none"> • Crop losses in South America • Trade flows favoring US exports on smaller Brazil crop • Weather risks in US • Tightening global old-crop supplies 	<ul style="list-style-type: none"> • Higher production in the Northern Hemisphere, especially the US • Crush margins getting pressured on bean prices • Weak Chinese hog margins



PRICE OUTLOOK

Expectations of bigger US soy acreage this spring could temper prices a bit. But all-time highs for soybean futures at \$18.25 could be taken out on exceptional strength in energy markets and general commodity inflation.



WHEAT: Black Sea Tensions Bring Added Risk

The war in Ukraine is the key item the wheat markets are centered on right now and has catapulted wheat prices to their highest levels in wheat since 2008. But even before then, wheat values were trading at high levels compared with history. Global wheat stocks are in their second year of decline with the likelihood of the tight stocks citation changing in 2022/23 is low. When looking at global exporters specifically, stocks have been on a decline for several years, which contributed to the start of the runup in values. But, the major short-term concern is lost wheat export potential and possible production losses this summer.

Major Exporters Key Wheat Numbers (MMT)

Argentina, Australia, Canada, European Union, Kazakhstan, Russia, Ukraine, United States

Items	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Total Supply	446	467	441	452	459	451
Domestic Use	224	226	217	216	216	220
Exports	167	166	156	175	183	181
Ending Stocks	75	75	68	61	60	51
Stocks to Use	19.1%	19.2%	18.4%	15.6%	15.2%	12.8%

Source: FBN/USDA, Chart generated on 03/02/2022

High protein wheat is in tight supply but signals are for a bump in acreage. Another item fueling wheat markets this year was the drought that hit the US Northern Plains and the Western Canadian Prairies. That resulted in a substantial cut to spring wheat and durum production versus last year and has pushed Minneapolis futures to well over \$10. Exports from the US and Canada are quite poor for spring simply because of a lack of supply. The case is the same for durum. Prices suggest acreage will be up for both classes in the coming growing season, which keeps downside risk present for futures into the coming crop year.

Where the US Fits into the Equation

The US is considered a residual supplier for wheat implying other key export countries would have to exhaust export capacity to begin to see international interest in US wheat. Freight is a disadvantage for the US given the location of some of the world's top importers (Egypt, Algeria, Turkey, Indonesia). With Ukraine and Russian wheat trade at risk, the US is poised to gain some buying, although that may take some time for other exporters to be depleted and may not add much to 2021/22 export targets today. For the upcoming season, we expect exports to turn higher and partially offset bigger acreage that is anticipated from US farmers.

- Higher acreage is expected given prices and input costs.
- Winter wheat seedings are up 2% versus last year with FBN's opinion that they are up more.
- Spring wheat and durum seedings are expected to be up as well (US and Canada).
- Exports will depend vastly on the situation in the Black Sea, but we are far from being competitive.
- But, in June-August, if US corn supplies are tight, we could get a pull for feeding.

US Wheat Balance Sheet (MB)

Items	2020/21	2021/22	2022/23 FBN Forecast
Planted	44.5	46.7	49.0
Yield	49.7	44.3	49.5
Production	1,828	1,646	1,965
Total Supply	2,957	2,591	2,713
Domestic Use	1,120	1,133	1,083
Exports	992	810	875
Total Use	2,111	1,943	1,958
Ending Stocks	845	648	755
Stocks to Use	40.0%	33.4%	38.6%

Source: FBN/USDA
Chart generated on 03/03/2022



PRICE OUTLOOK

Wheat values are a major barometer of war tensions in Eastern Europe. The longer the military action continues, the higher wheat prices need to go to fill the lost supplies from the Black Sea. US, Canada and European wheat will likely see higher acreage this summer, but not enough to offset the worst-case scenario of Ukraine and Russia unable to supply world needs.



BIOFUELS - PIVOTING AT THE PUMP

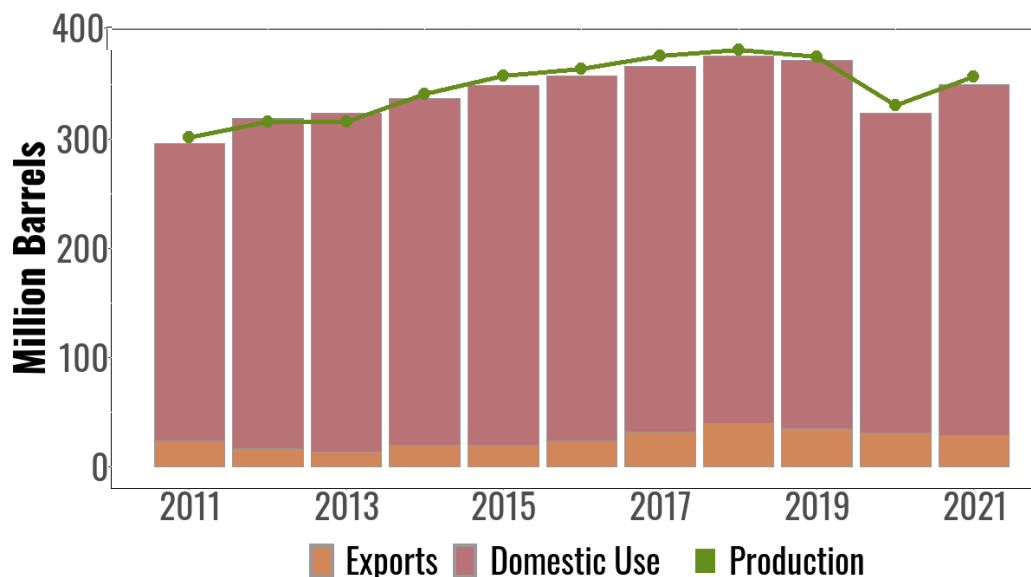
Biofuels have been a significant component of US commodity growth in the past 15 years with corn-based ethanol being the primary catalyst. But in 2022, policy priorities are shifting. Renewable diesel has been tapped as a critical growth area for commercial and aviation fuel, while domestic motor fuel policies are prioritizing electric vehicles, likely limiting ethanol growth in the future. Aggressive growth in renewable diesel bodes well for US farmers as new soybean crushing facilities come online in the next few years and will provide a strong market incentive for US farmers to plant soybeans, likely displacing some corn production.

Ethanol

After suffering from steep losses in 2020 due to COVID lockdowns, the ethanol sector enjoyed a brief recovery in 2021 and led to [plant profits](#) at their highest level in 7 years. But at the start of 2022, those strong economic forces waned and ethanol stocks ballooned. Now, as federal policies shift around renewable fuels it seems likely the ethanol sector is oversized. In December 2021 marquee changes were made to the Renewable Fuel Standard (RFS) that shows limited upside growth in domestic ethanol as a mandated fuel additive.

U.S. Ethanol's Constrained Growth

Since 2018, domestic use and exports have been declining and long-term demand-side growth seems unlikely



SOURCE: EIA/DOE data, chart created Feb 28, 2022



Key Factors Affecting U.S. Ethanol

Production	Domestic Use	Exports
<ul style="list-style-type: none"> Production reached a peak in 2018. Despite rebounding from the pandemic slowdown, 2021 continued the downward trend. Corn use is likely to fall, as less-efficient plants are retired. <ul style="list-style-type: none"> 15 bln gal of ethanol uses 5.2 bln bu of corn at a conversion of 2.9 bu/gal. The average efficiency was 2.92 bu/gal in 2020. It was 2.93 bu/gal in 2021. The average reached over 3.0 bu/gal during the height of the pandemic. At 3.0 bu/gal, corn usage falls to 5.03 bln bu. 	<ul style="list-style-type: none"> The EPA proposed retroactively cutting the ethanol blending requirement for 2020 to 12.5 bln gal and for 2021 to 13.3 bln gal. It would return to 15 bln in 2022. <ul style="list-style-type: none"> This lessens RIN credit reqs on fuel refiners. It's rumored 2022 may also be cut below 15 bln. The EIA forecasts gas demand in the US will remain below 2019 levels throughout 2022 and 2023. 40% of US workers are still working from home. <ul style="list-style-type: none"> If this reduces work-related driving miles by 20%, ethanol usage would fall 580 mil gal. 	<ul style="list-style-type: none"> A US export program has never really developed. Exports reached a peak in 2018. Even 2021 exports ran behind 2020's pandemic-affected levels. Brazil cut its own blending mandate in 2021. <ul style="list-style-type: none"> This is likely to stiffen competition for US exports. Potential export markets include China and Europe. China has not made biofuels an important part of its carbon reduction plans. <ul style="list-style-type: none"> China's blending rate is below decade-ago levels.

Key Factors Affecting U.S. Ethanol (continued)

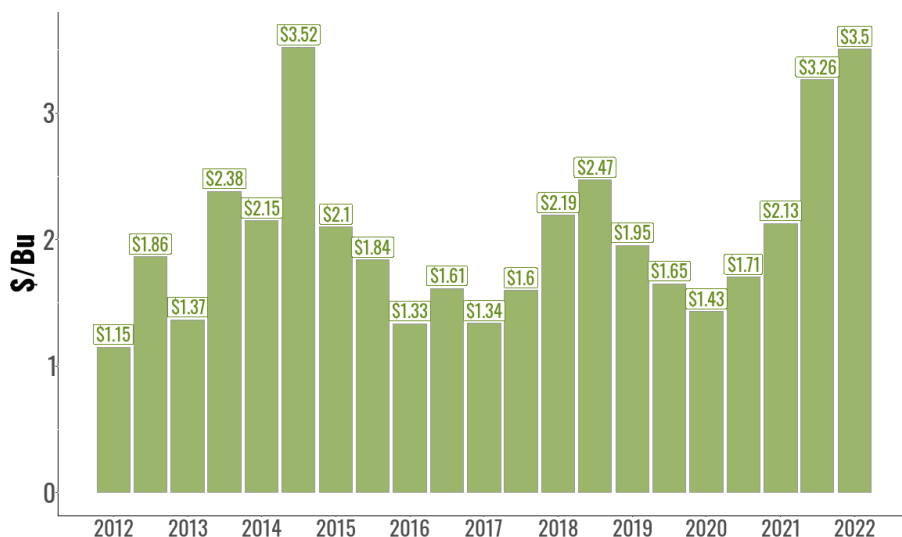
Production	Domestic Use	Exports
	<ul style="list-style-type: none"> EV sales almost doubled in Q4 2021 from a year ago to 3.4% of the auto market. <ul style="list-style-type: none"> They're forecasted to make up 10% in 2035. This would reduce ethanol usage by 1.4 bln gal. 	<ul style="list-style-type: none"> Europe's demand for ethanol <u>is forecasted</u> to increase 10% in 2022, though production will only rise 4%. <ul style="list-style-type: none"> EU sustainability specifications limit which U.S. plants can export.

Biodiesel and Renewable Diesel

While ethanol is largely stagnating, two other biofuels are seeing increased attention: biodiesel (BD) and renewable diesel (RD). Recent policy initiatives have favored RD as a key fuel source in aviation and commercial trucking. Price signals are aggressively hitting the soy market as soybean oil is one of the largest volume oil-based feedstocks to produce RD. In the past year, soybean processing spreads (measured as the value of soybean oil and soybean meal less the cost of soybeans) have been exceptionally strong at well over \$3 a bushel. Historically, this spread has averaged about half that mark. Today's strong values are encouraging the development of new soy processing facilities and expansion of existing plants.

Soy Processors Enjoy Margin Boom

Renewable diesel growth is providing big economic incentives to expand as soy crush spreads show protracted and sustained strength



SOURCE: USDA-AMS data updated through Mar 4, 2022.
Represents value of meal/oil less beans every 6 months.





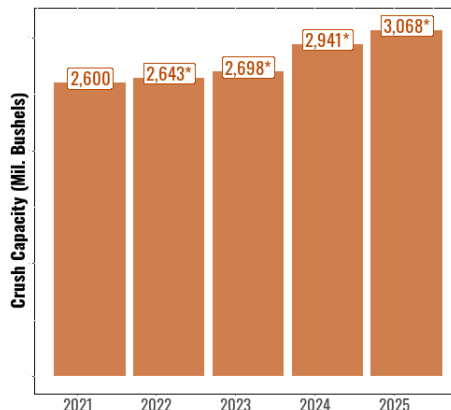
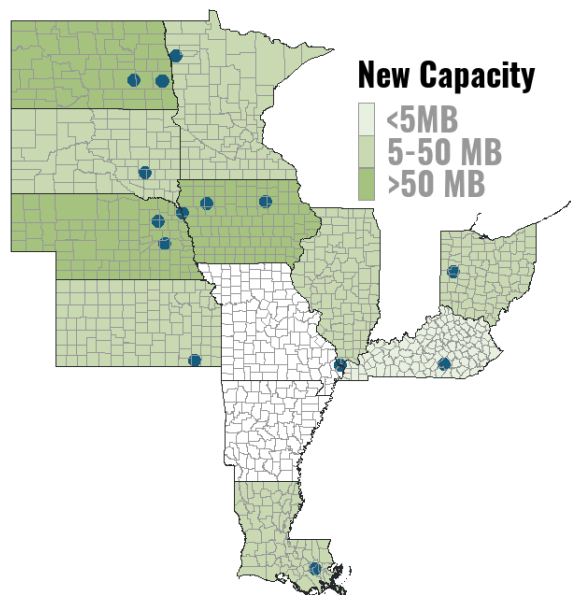
Key Differences Between Biodiesel and Renewable Diesel

Biodiesel	Renewable Diesel
<ul style="list-style-type: none">• Limited to blends of up to a 20% biofuel mixture.• Production reached a peak in 2018.<ul style="list-style-type: none">◦ Being replaced by renewable diesel in an almost 1:1 trade-off.◦ Likely to continue falling.• Has largely utilized soybeans for feedstocks.	<ul style="list-style-type: none">• Can be utilized in biofuel blends or can completely replace regular diesel.• Production is projected to grow rapidly.<ul style="list-style-type: none">◦ The USDA sees 2022 production at 1.59 bln gal.◦ The Soybean Export Council sees 2022 production at 1.38 bln gal, but it reaches 5.98 bln in 2024.• Has largely utilized waste fats and oils for feedstocks.<ul style="list-style-type: none">◦ Not enough waste to feed projected production.◦ Will increasingly use soybeans.

Several new soybean crushing facilities have been announced in the past year, along with several existing facilities that will undergo expansions. To our count, 10 new facilities have been announced since the start of 2021 that will open in the next 1-3 years. Once at full capacity, these plants will be able to crush more than 380 million bushels per year. Another four existing plants will undergo expansions, with three of them doubling capacity, adding at least another 85 million bushels. This added capacity is more than 20% of the USDA's current forecast for 2021/22 soybean crush.

Rapid Growth in Soy Processing

Strong market prices are creating big investments in new and expanded soy crushing capacity over the next 3 years



SOURCE: Various news and press release sources, * is projected capacity.



Consequences of the increased demand for soybeans going to RD production are 1) the need for more soybeans and 2) more soy meal entering markets. On the first point, the announced added crush capacity would mean about 10 million more acres of beans. More realistically, some of the 2 billion beans that are exported annually will be diverted to crush.

That said, the announced crush capacity is not enough to reach projected RD production, which means soy oil imports may need to increase. Net soy oil exports have been trending down over the past decade and RD production may push the US into being a net importer, pushing oil prices up. On the second point, the added crush is going to lead to much more soy meal, pushing those prices down. The US will need to export much of this, pressuring Argentina to modify its marketing strategies - for instance, filling the hole in Chinese imports left by the US.

An important factor in whether RD develops a prominent place in the US fuel mix will be incentive programs. These will mostly consist of tax credits and subsidies and carbon trading credits.

Incentive Programs for Biodiesel and Renewable Diesel

Tax Credits and Subsidies	Carbon Trading Credits
<ul style="list-style-type: none"> • The Biodiesel and Renewable Diesel Tax Credit <ul style="list-style-type: none"> ◦ Gives \$1/gallon to producers. ◦ Set to expire at the end of 2022, but could be extended with the Build Back Better Act. • Build Back Better Act <ul style="list-style-type: none"> ◦ Will extend the \$1/gallon through 2026. ◦ A tax credit for \$1.25 to \$1.75/gallon for the production of sustainable aviation fuel (SAF). ◦ \$300 million in grants for SAF R&D and plant construction. 	<ul style="list-style-type: none"> • Low Carbon Fuel Standard (LCFS) <ul style="list-style-type: none"> ◦ Administered by the California Air Resources Board (CARB). ◦ Credits are currently trading at about \$160/carbon ton, which translates to \$0.70/gallon of RD. ◦ Renewable natural gas and EV-charging stations are creating credits at a quick pace, lowering credit prices. • Renewable Fuel Standard (RFS) <ul style="list-style-type: none"> ◦ Blending mandates would create RINS that could then be traded, like ethanol.

WHAT IT MEANS FOR THE U.S. FARMER



2022 looks to be a pivotal year in the trajectory of the biofuels industry. The EPA's upcoming decision on the RFS will provide insights into just how much political support ethanol still has in Washington. Likewise, if the Build Back Better Act - or parts of it - is ever revived, it could determine the size of the burgeoning renewable diesel industry, as well as the soybean processing facilities that will feed it. But how much gas demand is lost due to the work from home phenomena and new EV sales could be the most fundamental force on the future direction of the biofuels industry.



FARM COST ESCALATION NOT LIKELY TO EASE

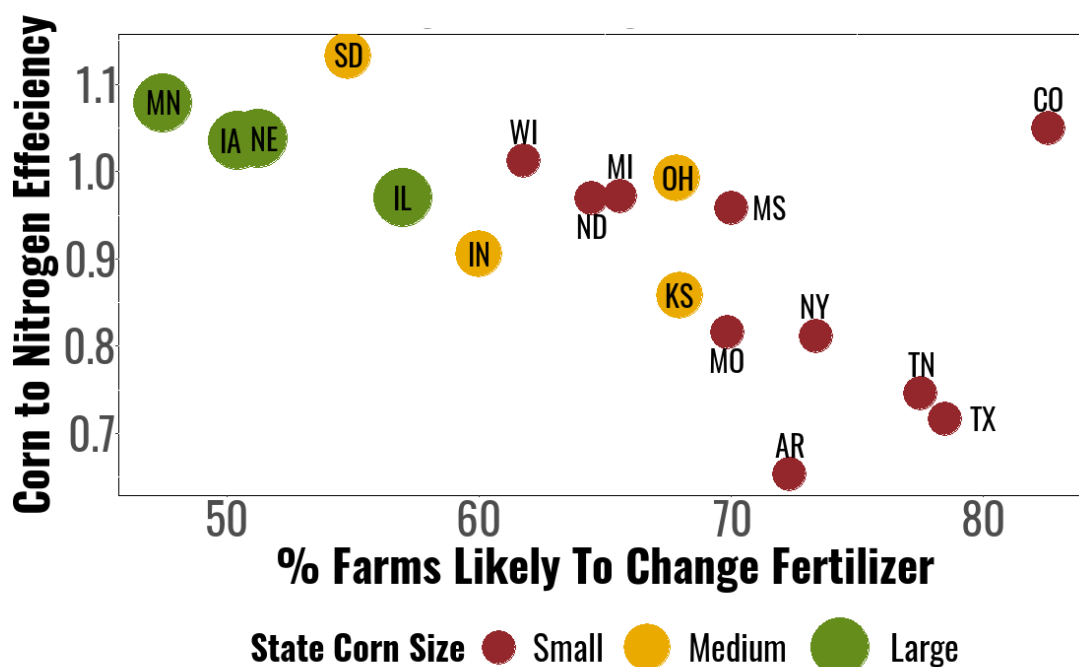
Fertilizer and farm chemical costs shot higher in the past 6 months as key US and international production facilities were temporarily taken offline. But since then, ongoing logistics constraints coupled with rising energy prices have kept input costs from pulling back. Land values have also pushed higher thanks to surging grain prices. With many farmers relying on rented ground, higher cash rents will impose added economic challenges for these operators. We see the balance of 2022 being a continued escalation of the cost side to farmer operations.

Fertilizer prices started to escalate in the fall of 2021 as Hurricane Ida damaged production facilities in the Louisiana Gulf. Adding to higher fertilizer prices was a steep runup in natural gas prices, which advanced 50% in a few short months around the same time. Although natural gas prices have retreated somewhat from their highs set in October 2021, they remain well above levels seen in recent years and have begun to move higher as global gas markets react to a possible loss of Russian natural gas supplies. Because of the inflated natural gas prices, nitrogen-based fertilizer values have been the most impacted, with year-on-year values in the US up about 100%. Meanwhile, phosphorus fertilizers are also higher but up only 50% in the past year.

Nitrogen fertilizers play a key role in corn production and will create challenging choices for US farmers making cropping decisions for 2022. FBN conducted a poll in mid-January 2022 to assess farmers' attitudes around their fertilizer plans. Nearly two-thirds of FBN farmers said they would either cut back on fertilizer usage in 2022 or attempt to source nutrients in alternative ways. Only one-third expected to keep the fertilization rates the same.

High Fertilizer Prices Drive Changes

FBN farmers who are in states with lower corn productivity for nitrogen are more likely to change the fertilizer usage in 2022



SOURCE: FBN poll conducted on Jan 15, 2022 with 2,970 responses.



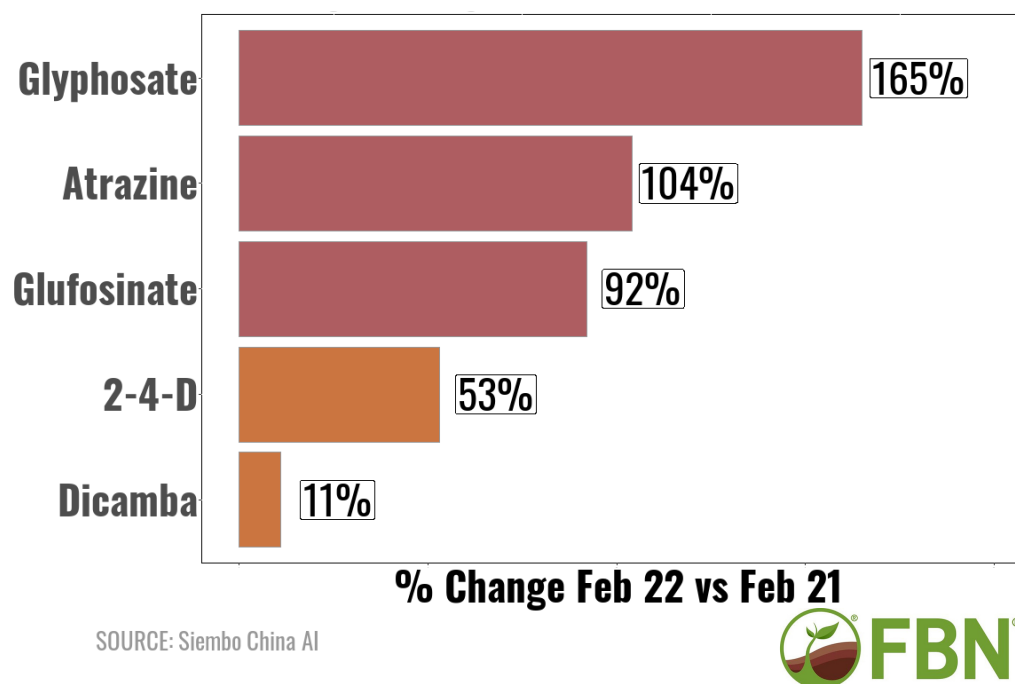
Responses differed across the country but can be directly linked to the efficiency of converting nitrogen into corn. Key corn growing states like Minnesota, Iowa and Nebraska are able to achieve relatively high corn yields versus the amount of nitrogen applied. Farmers in these key states generally achieve at or above 1:1 of corn pounds for every pound of nitrogen applied, and are less likely to change their fertilizer plans when compared to less productive states. We expect this delineation to also show up in crop decisions this spring, where less productive corn states will be more inclined to grow alternative crops like cotton (in the South), soybeans (in the Eastern Corn Belt) and spring wheat (in the Upper Plains).



Like fertilizer, farm chemical prices have seen exceptional price strength in the past 6 months; driven partly by the same factors discussed above. Government controls to limit coal-powered electricity forced numerous Chinese manufacturers to shut down this fall which resulted in China's role as a pivotal supplier of chemical intermediates and pesticide active ingredients. More recently, the extent of constraints seen in active ingredient markets was made clear in mid-February when farm chemical behemoth Bayer declared force majeure impacting the company's ability to supply customers with glyphosate or glyphosate-containing products. Indeed, glyphosate is one of the key herbicides used by US farmers as a broad weed control strategy and in conjunction with Roundup Ready seed technologies. Its price has increased sharply year-on-year compared to other key active ingredients and shows no signs of retreating heading into spring planting season.

Herbicide Active Ingredient Costs Skyrocket

Key farm chemical prices have increased from Feb 2021 to Feb 2022 and show few signs of declining in the near-term.



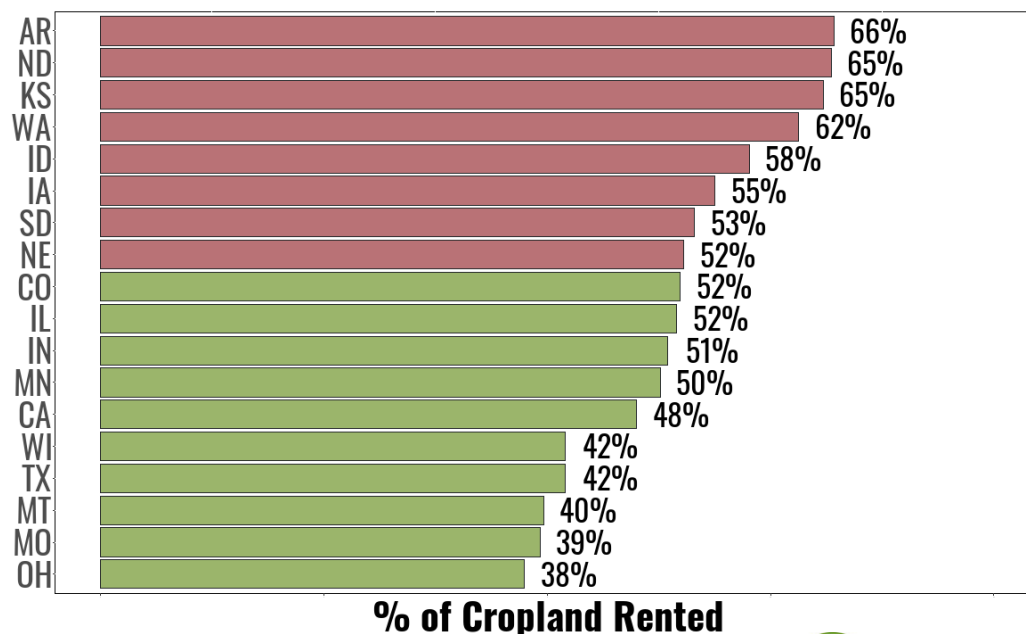
ARE FARMERS STILL LOOKING TO ACQUIRE FARM CHEMICAL NEEDS?

Based on an FBN poll conducted on February 5, 2022 with over 1,300 responses, nearly 30% of US farmers were still waiting to order some of their farm chemical needs for the 2022 growing season.

Finally, cropland values continue to increase in the wake of surging grain prices and historically low interest rates. Increasing land values can be wealth enhancing for landowners and farmers who own sizable acreage. But many farmers, especially younger farmers, have considerable acreage that is rented. An FBN poll found that farmers on average rent about half of the cropland they farm on.

Farmers Rent 50% of Cropland

As cropland values increase, farmers are exposed to higher rental rates



SOURCE: FBN Poll from Feb 11, 2022 with 596 responses.

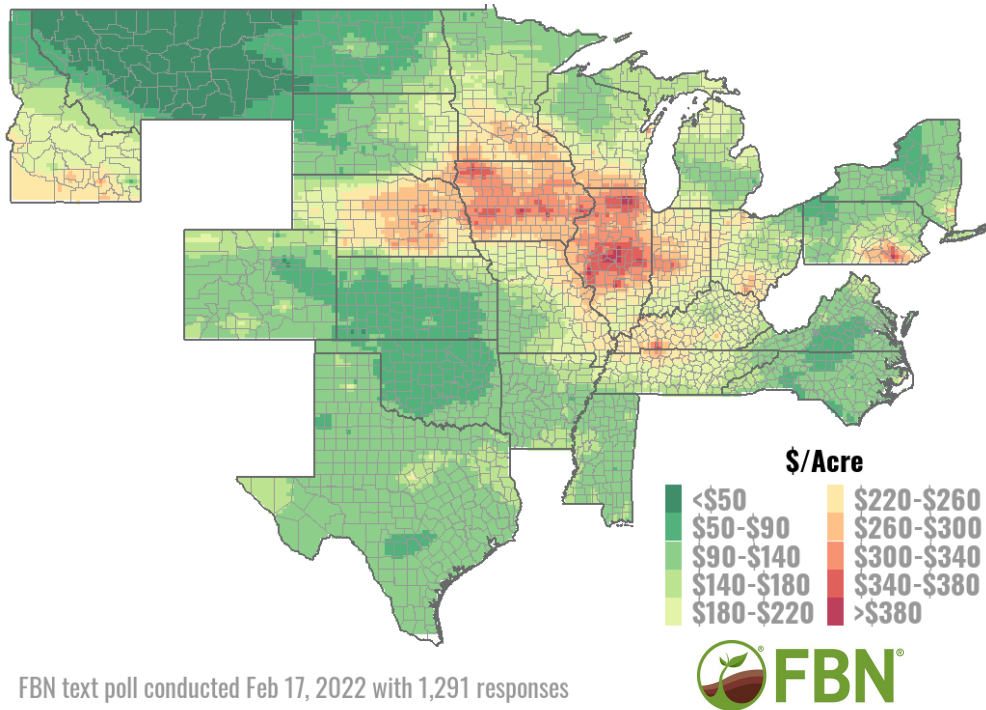


The highest cost regions for cropland rental are generally in Iowa and Illinois with recent cropland rental rates showing further signs of pushing higher. Average rental rates in these two key states are around \$300/acre based on an FBN poll conducted in February 2022, and represents a solid increase from a USDA survey conducted in the summer of 2021 showing average rents of \$230/acre.



Cropland Rental Rates Continue to Increase

Iowa and Illinois cropland rental rates averaged \$300 per acre, up from USDA's estimate of \$230 in summer 2021



FBN text poll conducted Feb 17, 2022 with 1,291 responses



FARM FINANCES EXPECTED TO FADE FROM 2021

High farm costs will likely cut into farm profitability in 2022 after an exceptionally good year in 2021. Grain prices for 2022 crops have begun to move higher and could continue to escalate even more on war disruption in Eastern Europe, which could put farm profits closer to the strong levels seen in 2021. However, farmer sentiment, as indicated by their willingness to invest in large machinery seems muted in the current environment.

A steady surge in grain prices over the past 18 months has helped improve the financial performance of US crop farmers. According to [USDA](#), 2021 net farm income is expected to reach its highest mark in 7 years. In some ways, 2021 was a nearly ideal financial situation for farmers. In late 2020 and early 2021 as farmers purchased inputs for the upcoming campaign, prices of fertilizers and chemicals were relatively depressed. By harvest in the late summer and fall, grain prices were much stronger than what had been expected at planting time. The combined low cost / high price environment gave farmers a healthy surge in farm profitability of around \$200 - \$300 per acre for corn and soy producers in the Midwest.



But for 2022 the countervailing forces of higher input costs and rising grain prices could present a potential setback in farm financial health. The biggest cost gains on a per acre basis are generally fertilizer and have the biggest impact on corn profitability, where nitrogen use is critical. Looking at potential cost increases for this line item alone will generally add an extra \$60 to \$120 per acre for many corn farmers in 2022 compared to 2021. Chemical prices, while generally up as much in percentage terms as fertilizer, have a lower impact on per acre cost variance. Here, we see farm chemical expenses are likely to be up \$10 to \$50 per acre with soybeans and cotton seeing the biggest gains due to widespread Roundup Ready technologies used:

Expected Change in Crop Profitability 2022 vs. 2021

Argentina, Australia, Canada, European Union, Kazakhstan, Russia, Ukraine, United States

STATE	CORN	SOY	SPRING WHEAT	COTTON
Iowa	-\$100	-\$30		
Illinois	-\$100	-\$10		
Indiana	-\$110	-\$7		
Nebraska	-\$50	+\$10		
Minnesota	-\$60	+\$15	-\$55	
North Dakota	-\$80	+\$10	-\$80	
Mississippi		-\$10		-\$200

Based on seed, chemical, fertilizer and land rent changes from 2022 to 2021. 2022 new-crop futures prices of \$5.90 for corn, \$14.30 for soybeans, \$9.15 for spring wheat and \$1.03 for cotton and assuming trend yields for each state in 2022. 2021 values are based on futures prices at harvest and state average yields.

Given where grain prices are today, farmers should still see comfortable profitable margins for the upcoming 2022 season. Also, upside potential on grain prices seems probable with a great deal of risk around the Russia-Ukraine conflict which could move profit margins up and closer to where they were in 2021.

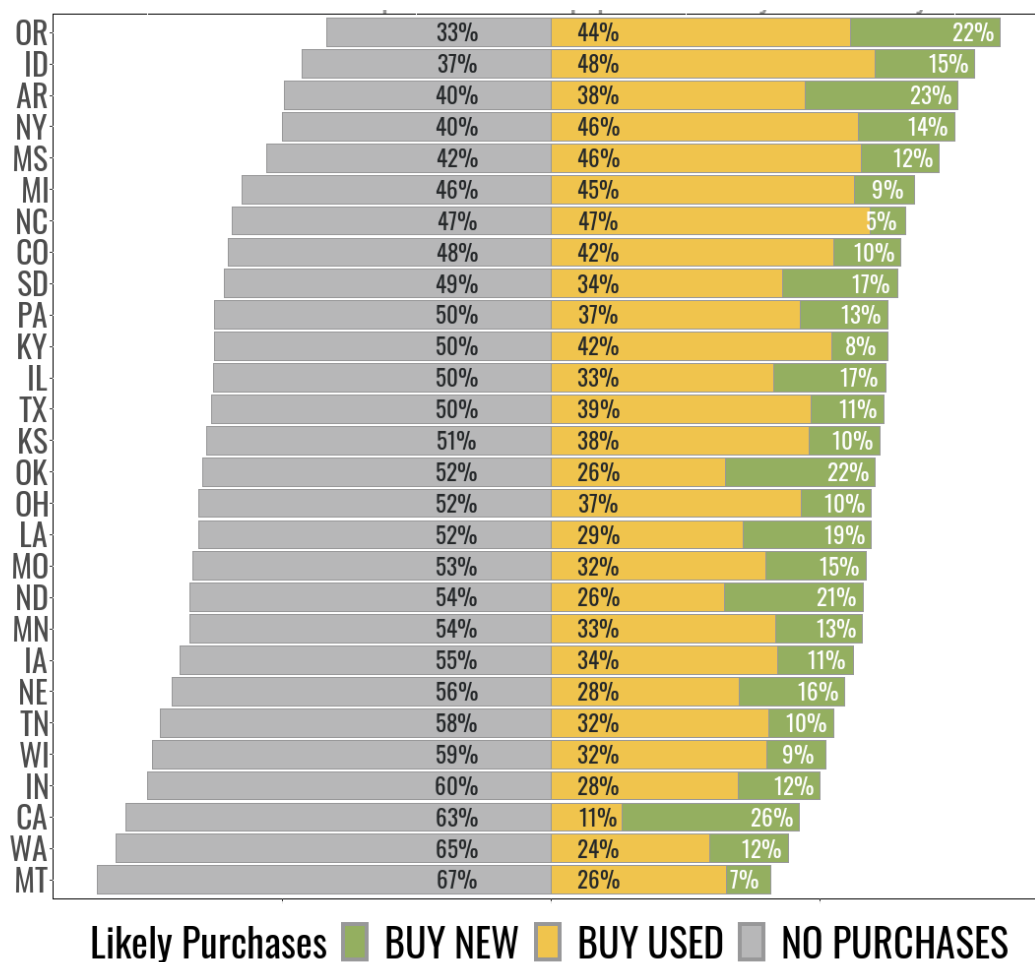


HOW FINANCIALLY SECURE DO FARMERS FEEL?

A key FBN gauge of Farmer financial security is member intention for purchasing large equipment over the next 12 months. Over half of FBN's members said they would not be purchasing large equipment in the next 12 months and only 13% said they would be purchasing brand new equipment. The remaining 34% were likely going to acquire used equipment.

Large Equipment Purchase Intentions Next 12 Months

53% of FBN Farmers are unlikely to buy large equipment over the next year. But 34% of Farmers intend to purchase used equipment and only 13% will buy new



FBN text poll conducted Feb 28, 2022 with 2,470 responses



As the world braces for war, the economic fallout will be escalating food price inflation and soaring energy costs. US farmers will respond by devoting ever more resources to grow larger crops in 2022, but do so at significant costs and higher risks. Despite this, we see the State of Agriculture as well positioned to meet the call to action.

MARKET RESEARCH TEAM



Our internationally recognized team of agricultural economists focus every day on keeping farmers informed by deriving insights from both market analysis and primary research with the FBN Network of 35,000+ Farmers.

The 2022 FBN U.S. Acreage Report will be released on 25-March-2022



Dr. Kevin McNew | Chief Economist

Kevin McNew focuses his research and analysis at the intersection of agriculture, markets and policy. In his role, McNew identifies and analyzes economic data and trends that add to our understanding of markets and their impact on farmers, consumers and the global economy. His work is a direct expression of the FBN mission to empower farmers with information and insights that help them make the best decisions for their operations.

McNew was raised on a farm in central Oklahoma. He earned his bachelor's degree at Oklahoma State University, and Master's and Ph.D. degrees in Economics from North Carolina State University. For over a decade, he was a Professor of Economics at the University of Maryland and Montana State University, focusing on commodity markets. He has received numerous academic awards for his research and outreach work, and is widely regarded for his expertise in boiling down complex economic issues into easy-to-understand concepts.

McNew has been recognized by Choices Magazine for Outstanding Applied Research Contribution, the American Agricultural Economics Association for Distinguished Group Extension Program and was awarded with Excellence in Publications for Outlook by the Association of University Economic Research, to name a few achievements. He regularly provides commentary for leading farm and business media outlets including Farm Journal, Successful Farming, NPR, Bloomberg, Dow Jones, and Reuters. In addition, he is a frequent speaker at conferences on topics of risk management, biofuels and new trading techniques.



Dr. Rejeana Gvillo | Senior Commodity Analyst

Rejeana Gvillo specializes primarily in grain and oilseeds markets. She focuses on identifying statistical relationships and generating visual graphics to accompany analyses. Gvillo previously held the role of Head of Grain and Livestock Research at IEG Vantage (formally known as Informa Economics) and held an adjunct faculty position at the University of Memphis, teaching both Macroeconomics and Microeconomics to undergraduate students.

After growing up on a cattle, catfish, cotton, and hay farm in West Alabama, Gvillo received her bachelor's in Agricultural Economics from Auburn University before going on to the University of Memphis to receive a speciality degree in Cotton Marketing from the International Cotton School. She then obtained her master's from Purdue and PhD from Texas A&M in Agricultural Economics. Her research broadly examined areas such as consumer demand analysis, behavioral economics, food/agricultural marketing, and production. Gvillo's econometric training primarily is focused on simultaneous demand equations, which typically suffer from endogeneity and serial correlation issues. She is driven by helping farmers minimize risk from a price standpoint.



Greg Evans | Junior Commodity Analyst

Greg Evans is a Commodity Analyst, focusing his time in the biofuels and grain markets. Evans was raised on a farm in Northern Virginia and received his bachelor's in biology from the University of Virginia. He received master's degrees in biology from both the University of Virginia and the University of Georgia and a third master's from the University of Georgia in Ag Business. Prior to joining FBN, Evans worked for the University of Georgia's Marine Extension Service and taught Environmental Science at the College of Coastal Georgia. Evans has his series 3 and series 30 licenses.



Together, we're unlocking the power of agronomic data

As a member of Farmers Business Network, you collaborate with over 36,000 Farmers working with FBN to unlock the value in data. By working together, we create reports like this to help all our members make knowledgeable decisions that can lead to managing a profitable business.

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