FARM CREDIT
OF CENTRAL FLORIDA

PANDEMIC SUPPLY CHAIN ISSUES FOR AGRICULTURE

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What are a nursery grower's options when the shipping cost for a single container of decorative pots jumps $20,000? How about a watermelon producer having trouble procuring wood pallets upon which to fill boxes? If the deadline for prepping central Florida strawberry fields is too close for comfort and no commercial delivery is available for that irrigation purchased months ago, where does one turn? In response to the latter case, one local farmer and his sons piled into pickup trucks towing flatbed trailers and ran West to Texas themselves to get it. These real-life examples are not exhaustive but symptomatic of the supply-chain breakdowns that have occurred and prolong over the Covid-19 pandemic.

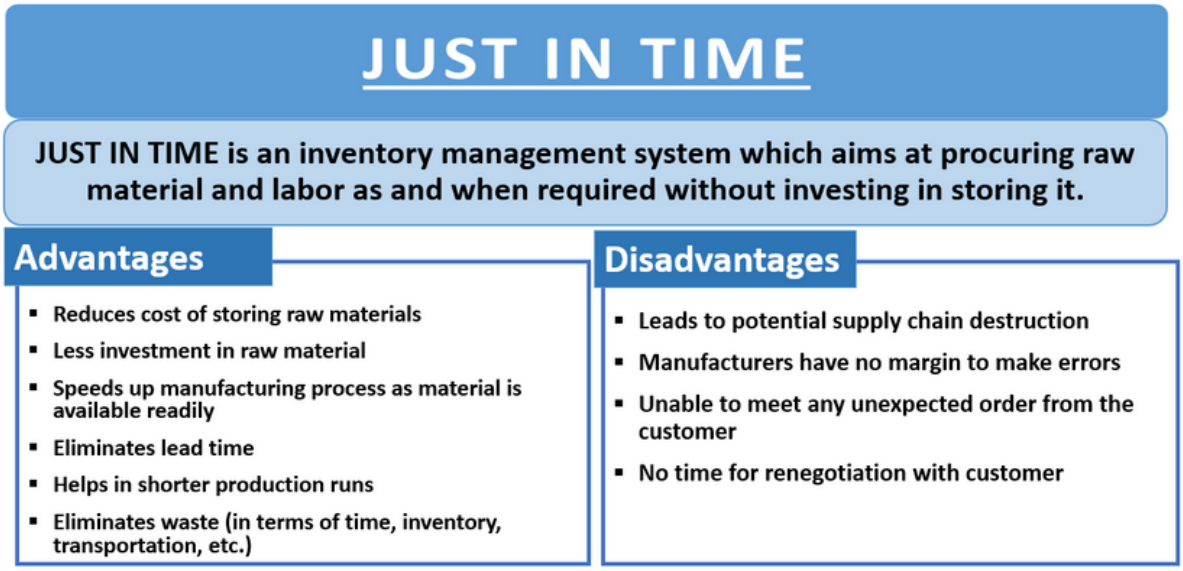
And the dearth was in all lands.

Farmers may be the backbone of our nation's economy but unfortunately, even as self-sufficient as they may be, are not immune from input shortages or equipment hiccups. Ag producers have all at some point experienced delays in aspects of their supply needs whether seeds, fertilizer, chemicals, liners, or something else. In the past, these issues have generally been short-lived and impacted single (or very few) products. Hurricanes, droughts, floods, fires, and freezes regularly disturb growing seasons and are part of life. Over the course of the pandemic, however, there have been prolonged sourcing problems with what may seem like everything – with no end in sight.

Media outlets across the spectrum of news recently picked up on various supply-chain issues, generally those most visibly affecting the average consumer. Examples include used car prices being higher as new vehicle production stalls. WingStop switching to thighs because of the lack of wings. Gas prices rising for a multitude of reasons depending on who is reporting – not to mention the crisis in petrochemicals that resulted from historic freezes in Texas. The backlogs and shortages are legion, so for the sake of time let us go over a few selected glaring issues.

Widespread Implementation of Lean / Just-in-Time Inventory

One of the most glaringly visible economic cracks highlighted by the Covid-19 crisis has been the fragility of global supply chains. Academics, economists, journalists, and novice pundits will study and opine on what happened and who is to blame for the failures for years to come. An in-depth expose is outside the scope of this review, but it is essential to highlight some of the causes that brought the world's logistics to heel. Soon after runs on toilet paper and shortages of N-95 masks made the news two camps emerged: those blaming "lean" and "just-in-time" inventory systems, and those defending "lean" and "just-in-time" inventory systems.



Source: https://business-accounting.net/what-is-just-in-time-inventory-management/

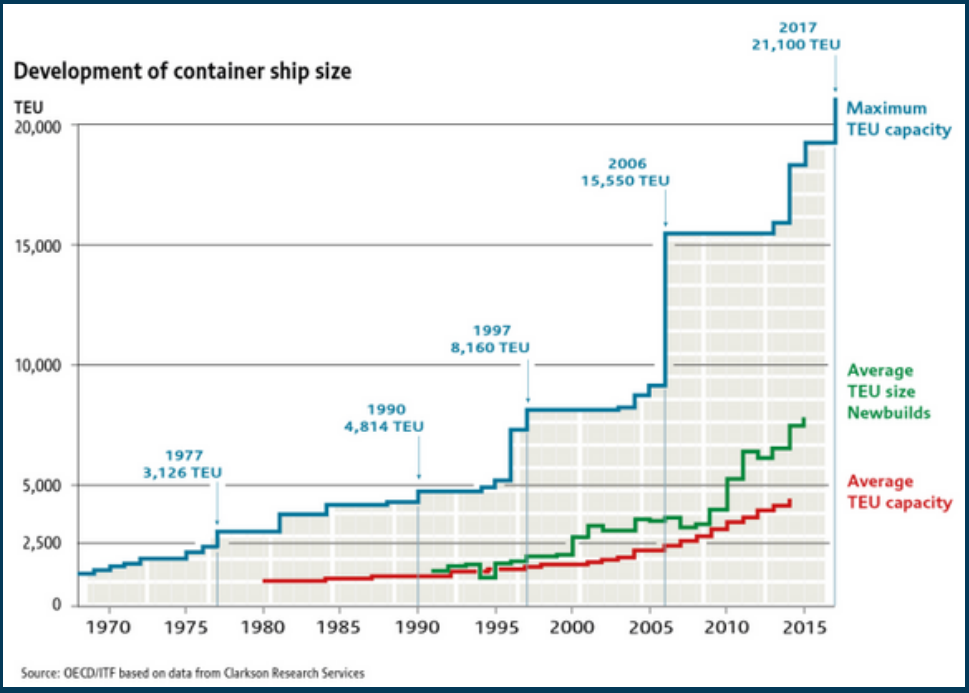
The graphic above succinctly depicts a clear picture of the situation. First popularized by Toyota, "just-in-time" can perform exceptionally well and pad the bottom-line, but it is not without risks. Over the past 50 years, the system has become gospel in supply-chain programs across global business schools, especially its concept of kanban – where orders from suppliers are "pulled" on a need basis. The success of global supply chains for decades without major hiccups (save the Fukushima disaster of 2011) incentivized businesses to become complacent and spoiled ("if it ain't broke don't fix it"). When Covid hit, however, it did break, as the graphic above mentions: there is no margin for error. One bottleneck in a supply-chain linkage of dozens is a problem, all of them breaking simultaneously is a disaster.

Defenders of just-in-time have blamed over-reliance on China, lead times stemming from transit of finished product built wholly overseas, the error of claiming to be lean but not truly "pulling" orders, and even lacking "mature lean systems" as reasons for the failure, not the system. One explained the breakdown as companies having "created a system that's less effective and less resilient but can impress shareholders through short-term savings." These points, however, and the shortcomings of lean, are not mutually exclusive.

The bottom line is that to varying degrees of implementation and varying success rates lean manufacturing is the norm. It does not work in all circumstances, and it has its weaknesses, but it has never been tested at such a scale as the pandemic, which was a perfect storm. One just-in-time ideologue said “that Toyota was the only major vehicle manufacturer not affected by the semiconductor shortage because: 'Toyota followed its own principals. It did not stray from them and it did not reinvent them. It’s no surprise that Toyota excels at implementing its own system but it is a surprise that the entire manufacturing world has so wholeheartedly embraced flawed implementation of the system.’” Unfortunately, what goes around has come around and Toyota has also fallen victim to shortages, announcing in mid-August that it would cut vehicle production by 40% in September due to lack of semiconductors. Just-in-time is great, until it isn’t – like any imperfect system.

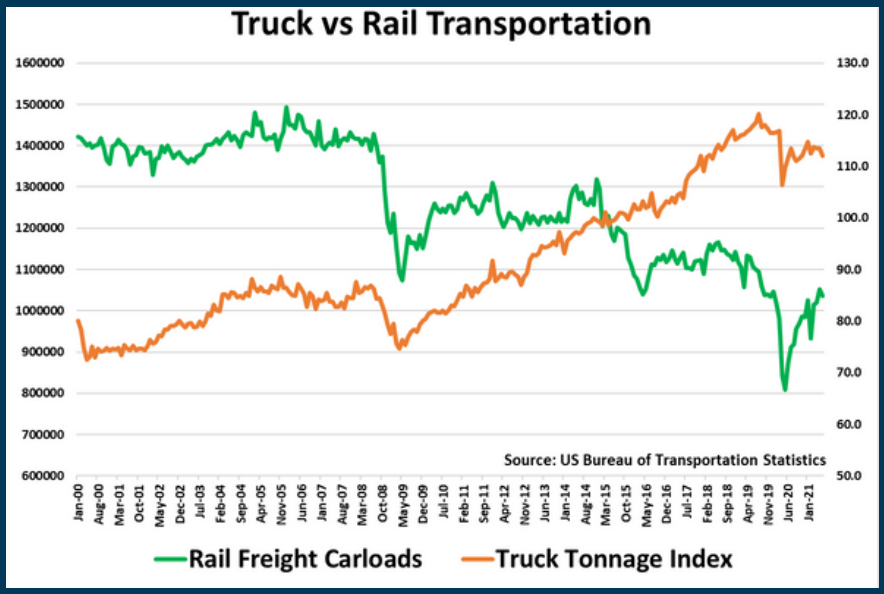
Backlogs at Ports and Transportation Hubs

Since August 26, 2021 new records are being set almost daily for ships waiting to unload outside Long Beach and Los Angeles, the largest port system in the US. The 47 vessels waiting offshore exceeded the previous high set nearly two decades ago during the longshoreman strikes. A terminal shutdown at China’s third-largest port at Ningbo has led to 48 vessels anchored in queue. In response to slowdowns at major ports, some carriers have attempted to unload at smaller locations, initiating a domino effect that has exacerbated lags nationwide. Chinese shipping company Cosco reported its turnaround time for trips to the American West Coast has increased from 42 days to 50 days, and German firm Hapag-Lloyd is experiencing a global turnaround increase from 50 days to 60 days. To make matters worse, this 20% rise in shipping times industry-wide will inevitably have an exponentiating effect as orders keep getting pushed further down the line. With freight rates skyrocketing (including a 600% increase from Shanghai to LA) and transportation companies cash-flush, new orders for containerships have set new levels and demand for new containers has jumped as well. While additional vessels and boxes on the water may lead to reduced shipping costs the burden of offloading delays lies at the ports themselves.



Source: https://www.itf-oecd.org/sites/default/files/docs/15cspa_mega-ships.pdf

Adding to the conundrum is the fact that container ships continue to grow larger. From an average of 3,100 twenty-foot equivalent units (TEUs) per ship in the mid-1970s to 24,000 TEUs today, an 800% increase. This requires not just additional unloading capacity but also efficiency in moving containers out of port into the domestic US. Rail transportation across the country has been trending lower since the mid-2000s, while truck tonnage has grown strongly.



While rail transportation has been increasing over the last two years, it is still well below levels of the mid-2000s and is struggling to surpass pre-pandemic totals. Trucking has picked up some of the slack, but it too has been unable to recover to tonnage moved before March 2020, dropping again last month.Thus, there is a combination of a bottleneck with ships piling up at ports across the country along with internal transportation not yet recovered from Covid impacts, at a time when replenishing supply chains is at its most critical juncture.

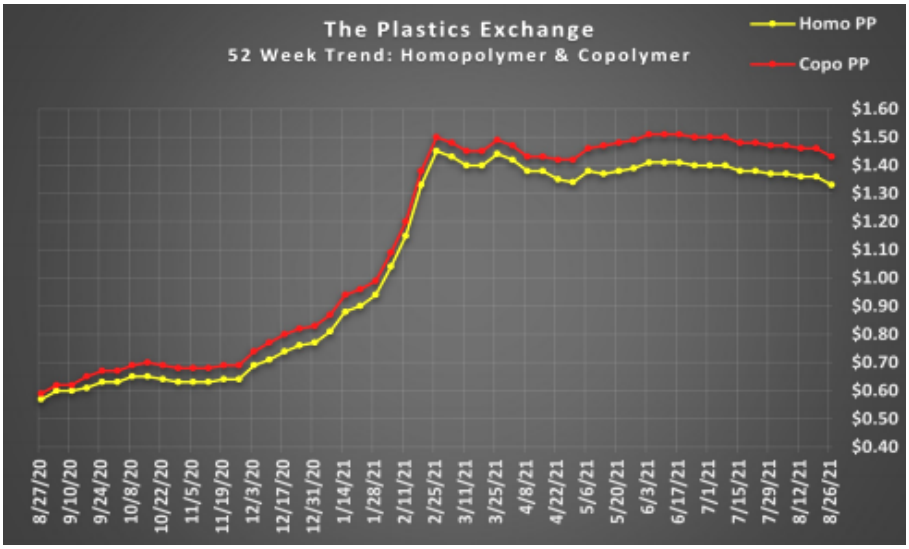
Semi-Conductor Shortage

GM recently idled three American plants, the world's largest semiconductor manufacturer announced it would be raising prices by 10-20%, and, as mentioned, Toyota recently announced it would reduce vehicle production by 40% due to lack of chips. Manufacturers across the globe have curtailed assembly lines due to the shortage, and while the news media has been (rightly) concerned with slowdowns in car and electronics production, much less attention has been on farming equipment.

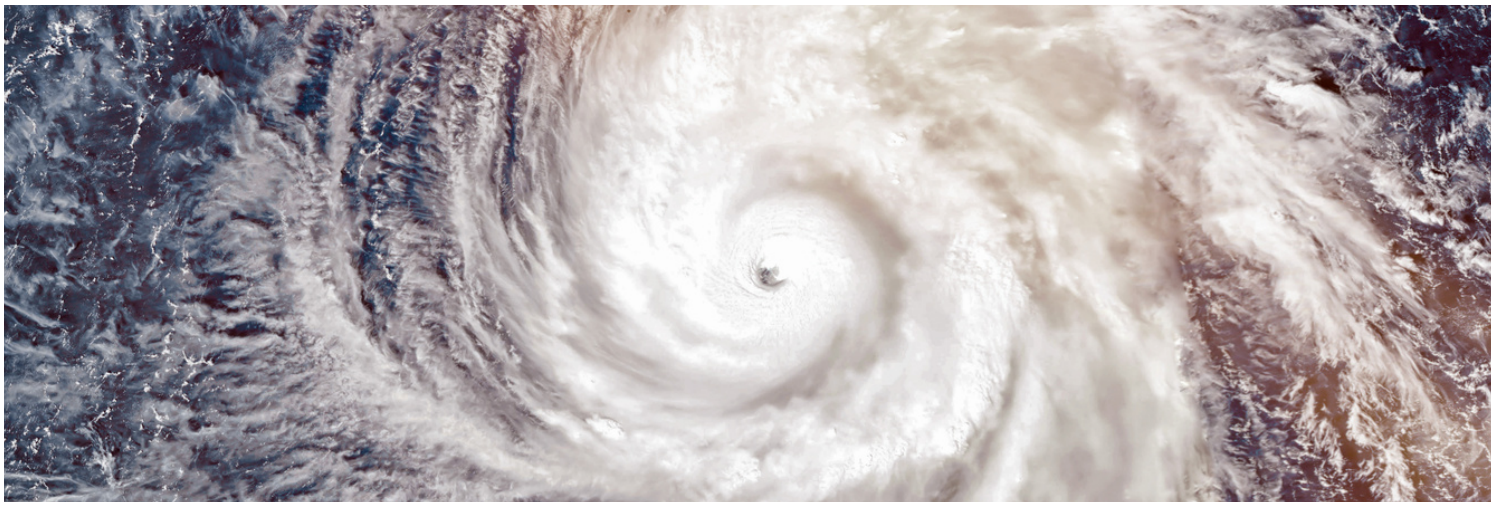
Technological advancements and precision agriculture have made significant strides in improvement for the ag industry, but much of this is reliant on computer processing, and thus chips. As a result, early in 2021 John Deere began warning its dealers to be prepared for this fall's equipment to arrive without GPS receivers. By May, the directive issued was that receivers, extended monitors, and related technology would not be arriving for the crop year at all – sourced orders with delivery dates would become unsourced. As far back as April 2021 AGCO was warning customers that new equipment expected would likely be six months late, missing the 2021-22 crop year. CaseIH is facing similar challenges: dealers are not able to place new orders for high-tech planters due to uncertainty regarding chip availability. Dealers are pulling parts off-of inventory in their yards to help those in a pinch, some farmers are dusting off tractors not used since the 1980s, and many will return to the "dark ages" working this harvest without yield monitoring or GPS.

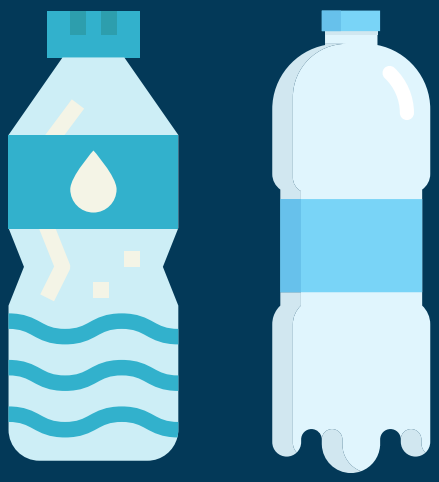
Record Prices and Shortages of Chemicals and Plastics

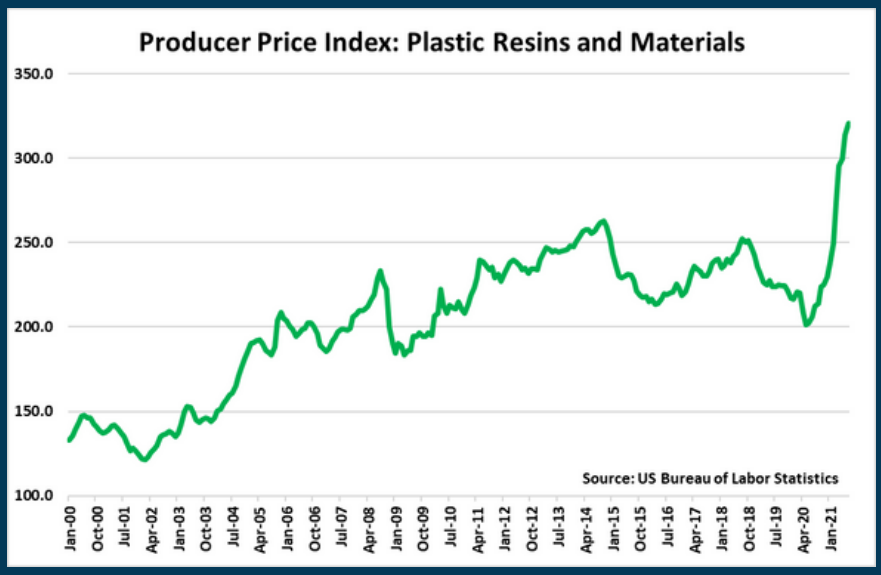
Some industry complexes appear unable to catch a break, especially petrochemicals. From 2018 up through the beginning of the pandemic, import prices of plastics and chemicals were on the decline, and dollar value of imports was appearing to plateau. Like many other products, the cost of chemicals and plastics dropped noticeably – but that was short-lived.



Instead of values simply recovering to pre-Covid levels, a deep freeze in Texas paralyzed the world's largest petrochemical complex. As a result, prices across the plastics and chemical complex jumped to never-before-experienced levels. This coincided with a massive upswing in construction activity, especially in the Southeast, where over 60% of new home building is occurring. Thus, not only were supply chains rehabilitating after pandemic shutdowns, there was an unusual exaggeration of demand, coupled with plant shutdowns. Shortages of PVC, resins, and polymers were especially felt throughout the country, with many businesses exercising force majeure – claiming unforeseen circumstances prevented them from fulfilling a contract. Six months later, while some supply has reentered the market, high prices have remained on a plateau. Making matters more complicated, many wholesalers have held onto product in case of another potential setback, which is now occurring with Hurricane Ida hitting the Gulf Coast. The complex has not recovered, and it remains to be seen the impact the storm will have going forward.

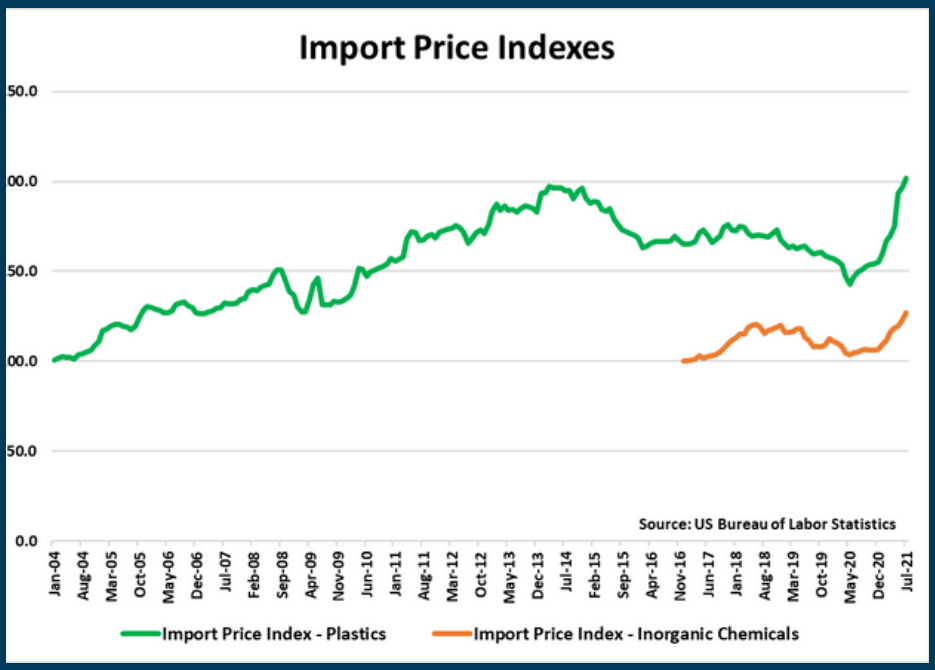






Exports Hampered by Containers Sent Back to China Empty

An additional negative externality brought about by the backlog in container shipping is that for some firms it is economically advantageous to return empty boxes back to China instead of refilling with American goods. Freight from the US back to China is one-fifth (or less) of the price of transit for containers coming from China. Waiting for a container to be cleaned and then loaded with American products is an additional burden for companies already experiencing a 20% loss in turnaround time.



CNBC has estimated that the US missed $1.3 billion of potential grain exports from July-December of 2020 due to shippers rejecting cargo opportunities in favor of empties. The Agriculture Transportation Coalition has reported that while the quantity of containers leaving the US is at an all-time high, the number of those loaded with cargo is the lowest since 2015. Legislation has been introduced in Congress that would forbid carriers from unreasonably declining export cargo as well as prevent additional charges for delays outside of shippers' control (among other provisions). Entitled the Ocean Shipping Reform Act of 2021 (HR 4996) and sponsored by Rep. Garamendi (D-CA) the bill is currently in subcommittee.

H2A / Domestic Labor Issues

Securing farmworkers has been a struggle for decades in the US but Covid-19 has made it even more difficult. While the Trump administration did not halt the ag-specific H2-A visa program over the pandemic, it did attempt to streamline some aspects of the application process as well as freeze wages before Joe Biden took office. The new administration quickly reversed those directives. With recent census data revealing a decrease in rural populations across the US, as well as strong demand for labor in other sectors of the economy, the agricultural industry is struggling to fill jobs. Record numbers of employees across the country have been quitting as competition in wages has increased, a problem across the economy. The labor shortage in agriculture, an existing issue for quite some time, has only been exaggerated by the pandemic.

Conclusion

Taking a step back, 2020 in many ways was a phenomenal year for agriculture. Commodity prices rose, fresh fruits and vegetables were in such demand that frozen stores began to dwindle. Some meat prices remain elevated, and work-from-home, TikTok, Instagram helped drive demand for everything from feta cheese to yeast to indoor plants. In a typical environment, this would have led to increased spending and capital investment across the complex: new tractors, implements, irrigation, greenhouses, etc. Unfortunately for many, the supply of those products does not exist.

While there is still equipment being produced, significant demand this season across a multitude of products will not be met.

On the other hand, not all buyers have experienced problems sourcing materials and machines. One salesman of PVC irrigation with whom I spoke has had no trouble for the past eighteen months and told me he did not know “how the boss got material, but he did.” Other domestic manufacturers of pots and parts have claimed their American input sources have been able to adequately supply their needs. John Deere, CaseIH, AGCO, and other equipment makers might be very short on semiconductors, but they are still building the products that they can.

The engines of manufacturing are still running across the country, but many are sputtering and stalling or running on fumes. At this point, it is necessary to understand that two of the most important terms in approaching business risk are "uncertainty" and "volatility." Unusual price risk volatility continues to appear across products and inputs, some of which can be hedged with futures or forward contracts. On a parallel note, however, price-locks on contracts that end up not being fulfilled from cancellation or under force majeure are meaningless. Some companies, such as Urban Crop Solutions, have switched from a "just-in-time" inventory system to "just-in-case," where six months of critical components are stored in inventory. Though not an agricultural supplier per se, Best Buy has accumulated inventories 55% higher than last year at this point and 23% above pre-pandemic levels to prepare for the holiday season.

Nearly a century ago in rural South Carolina a WWI flying ace decided to keep all of his textile mill workers employed during the Great Depression. Elliott White Springs stored up inventory of linens and sheets for nearly a decade until a new crisis occurred, a war with a military that needed lots of cloth (see Burke Davis' War Bird). On the other hand, the parable of one who built bigger barns warns that is not an excuse to just "eat, drink, and be merry." The solution is not a one-size-fits-all approach, as the range and breadth of the agricultural and horticultural industries is diverse. Certain products such as popular GMO corn varieties or phosphate fertilizers are unlikely to experience much disruption, but a new yield monitor will. Some irrigation tile will appear early, while containers of pots will remain in China without an estimated time of arrival. The new norm is uncertainty, but successful growers will adapt, whether that means finding multiple sources for inputs or the farmer specialty of just "rigging it."

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Prior to joining Farm Credit of Central Florida he conducted economic research on agricultural commodities for IHS Markit (previously Informa Economics Group), and spent time in hedging /risk management and as a commodities trader for Central States Enterprises, Inc. Stevan also earned an M.A. from Columbia University and undergraduate degrees from the Moore School of Business at the University of South Carolina, where he triple-majored in International Business, Global Supply Chain and Operations Management, and Finance.

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