# 2022 Price Outlook for Corn and Soybean Inputs and Carbon Market Basics

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# Take Home Message

- Need to be thinking about profit maximizing decisions not yield or price maximizing.

- More aggressive with output price risk management.

Prices and availability

# INPUTS

# Supply Chains

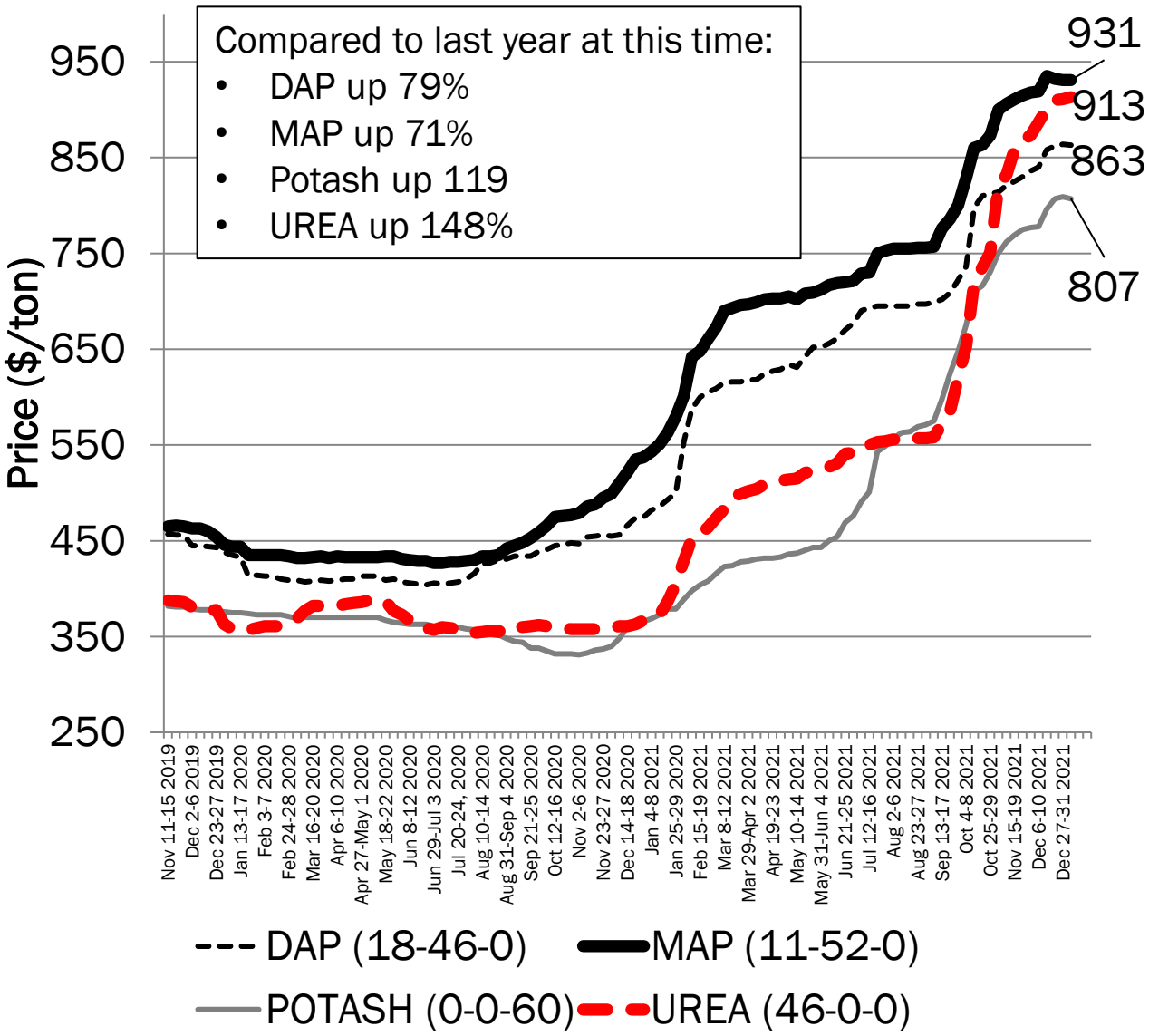
- Supply chains go unnoticed when they work well.
- Supply chain efficiency versus resiliency.
  - Walmart.
  - Vertical integration.
- Risk in owning inventory when prices run up.

# Inputs Prices and Availability

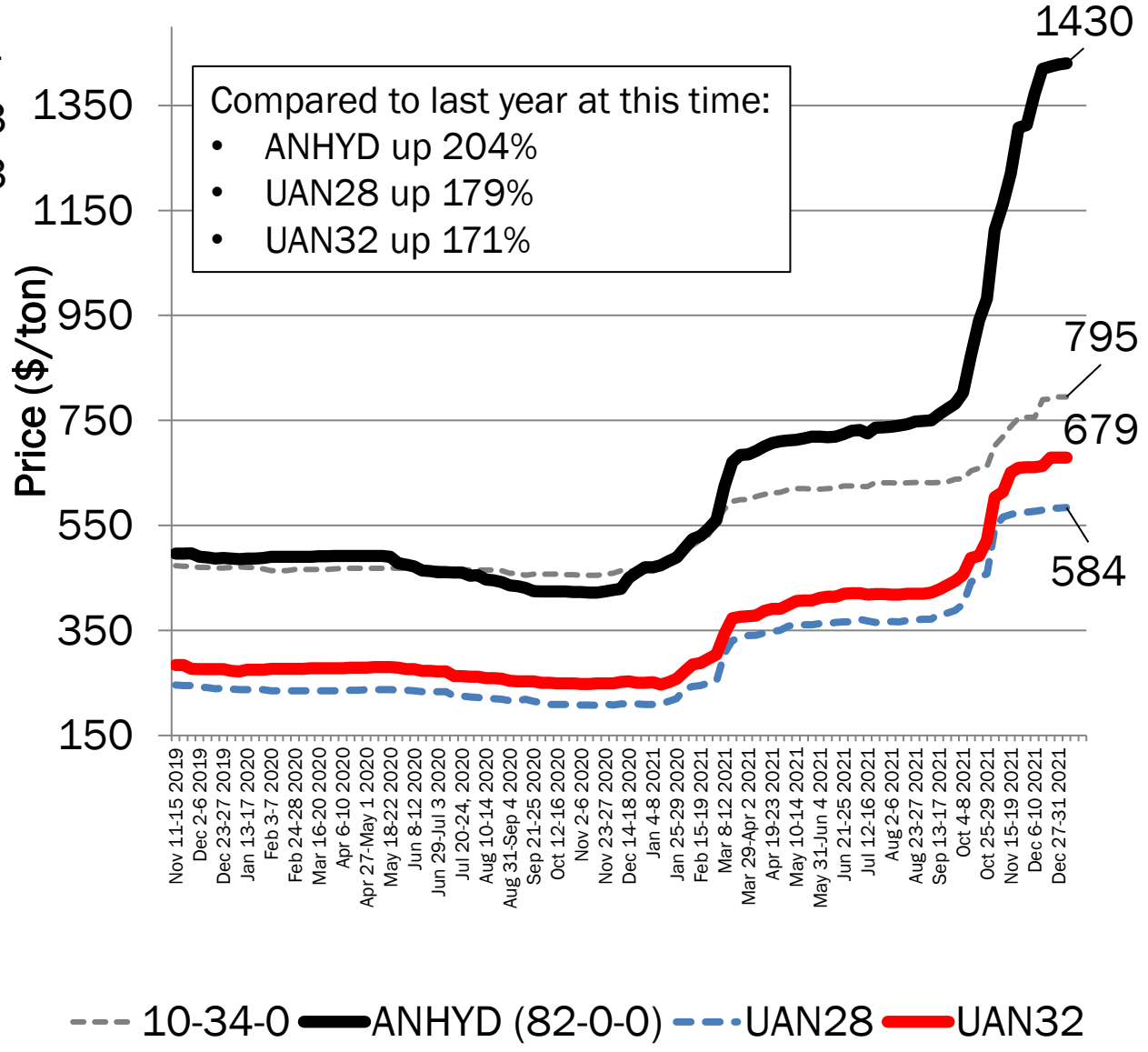
- Land prices and rents are up.
- Prices for most crop protection products and fertilizers are up substantially.
- Availability of inputs is currently a concern.
- Labor shortages.
- Trucking and logistical issues.
  - Port delays.
  - 11 hour driving time?

- **Will prices be cheaper before thee are needed in 2022?**

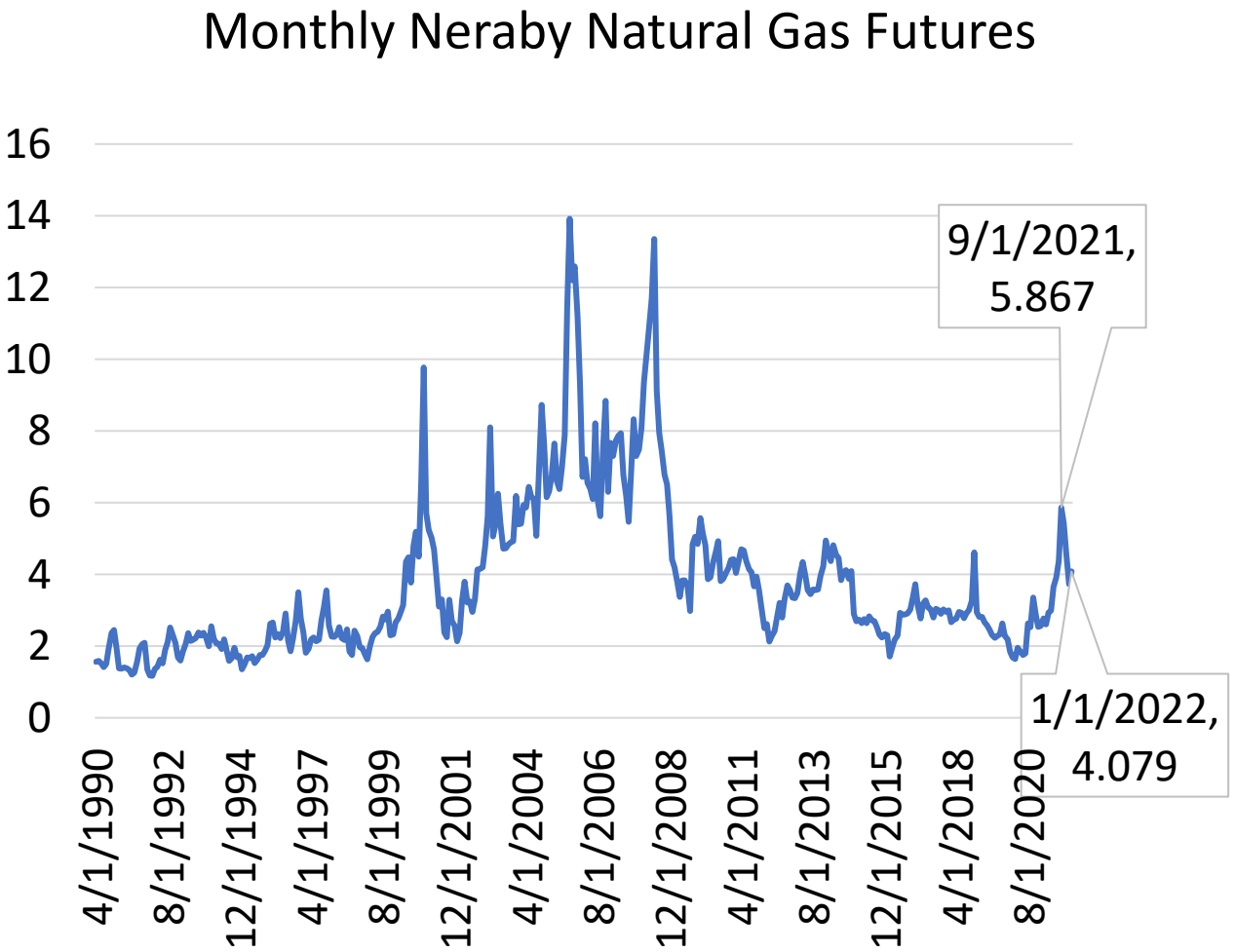
# Dry Fertilizer Price, 2019-2022




# Liquid Fertilizer Price, 2019-2021



# Is There Hope For Lower Fertilizer Prices?




Natural gas prices are down 30% from the peak – Up 59% compared to last year.

Other factors are influencing fertilizer prices.

- Domestic production (hurricanes).
- Constrained foreign production (China).
- Tariffs (Morocco and Russia).
- Supply chain logistical issues.
- Increased global demand.
- India fertilizer stocks.

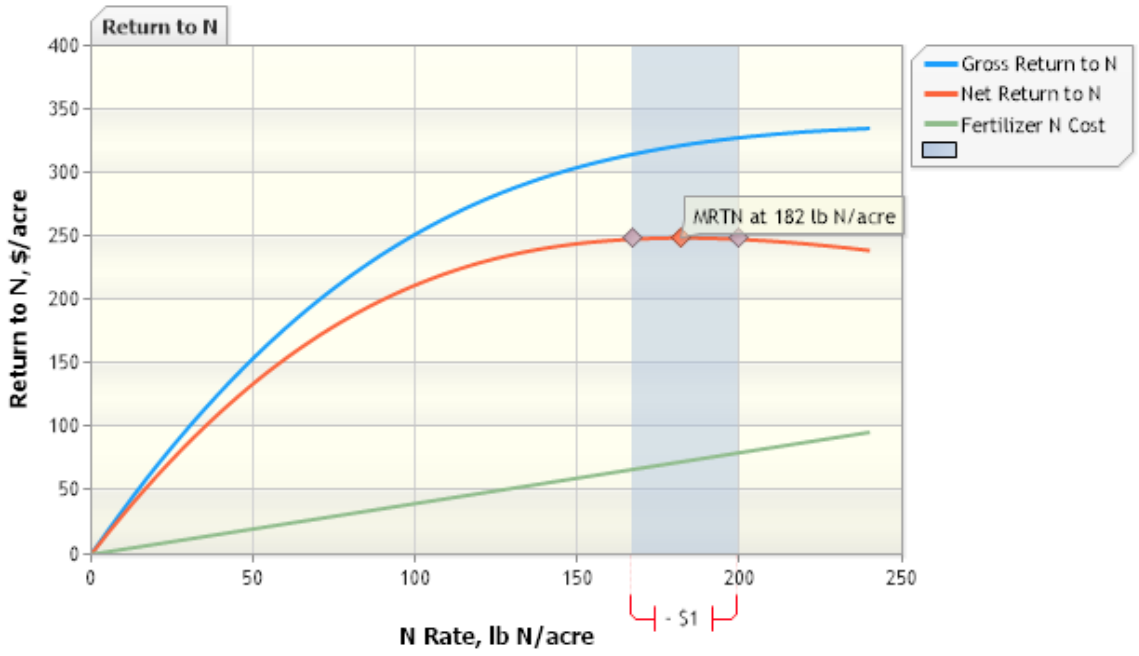
Lower natural gas prices should help with lowering nitrogen costs but there are a lot of other moving parts in fertilizer prices.

## Rates and Charts

State: Ohio
Number of sites: 228
Rotation: Corn Following Soybean

| | |
|---|---|
| Nitrogen Price ($/lb): | 0.40 |
| Corn Price ($/bu): | 4.17 |
| Price Ratio: | 0.10 |
| MRTN Rate (lb N/acre): | 182 |
| Profitable N Rate Range (lb N/acre): | 166 - 199 |
| Net Return to N at MRTN Rate ($/acre): | $248.82 |
| Percent of Maximum Yield at MRTN Rate: | 98% |
| Urea (45% N) at MRTN Rate (lb product/acre): | 404 |
| Urea (45% N) Cost at MRTN Rate ($/acre): | $72.80 |

2021

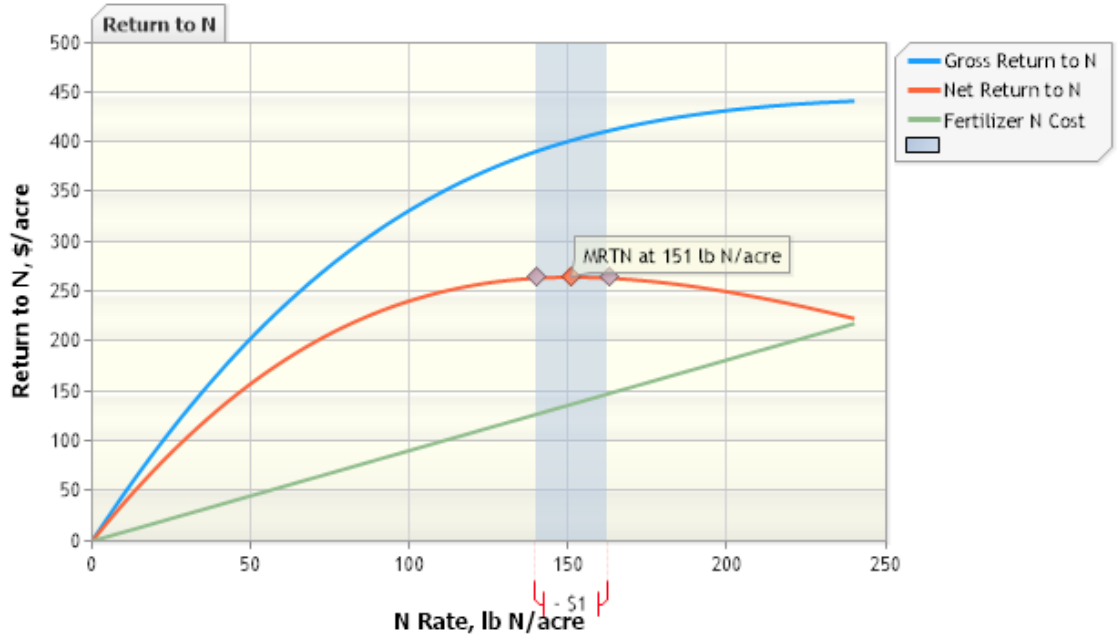



## Rates and Charts

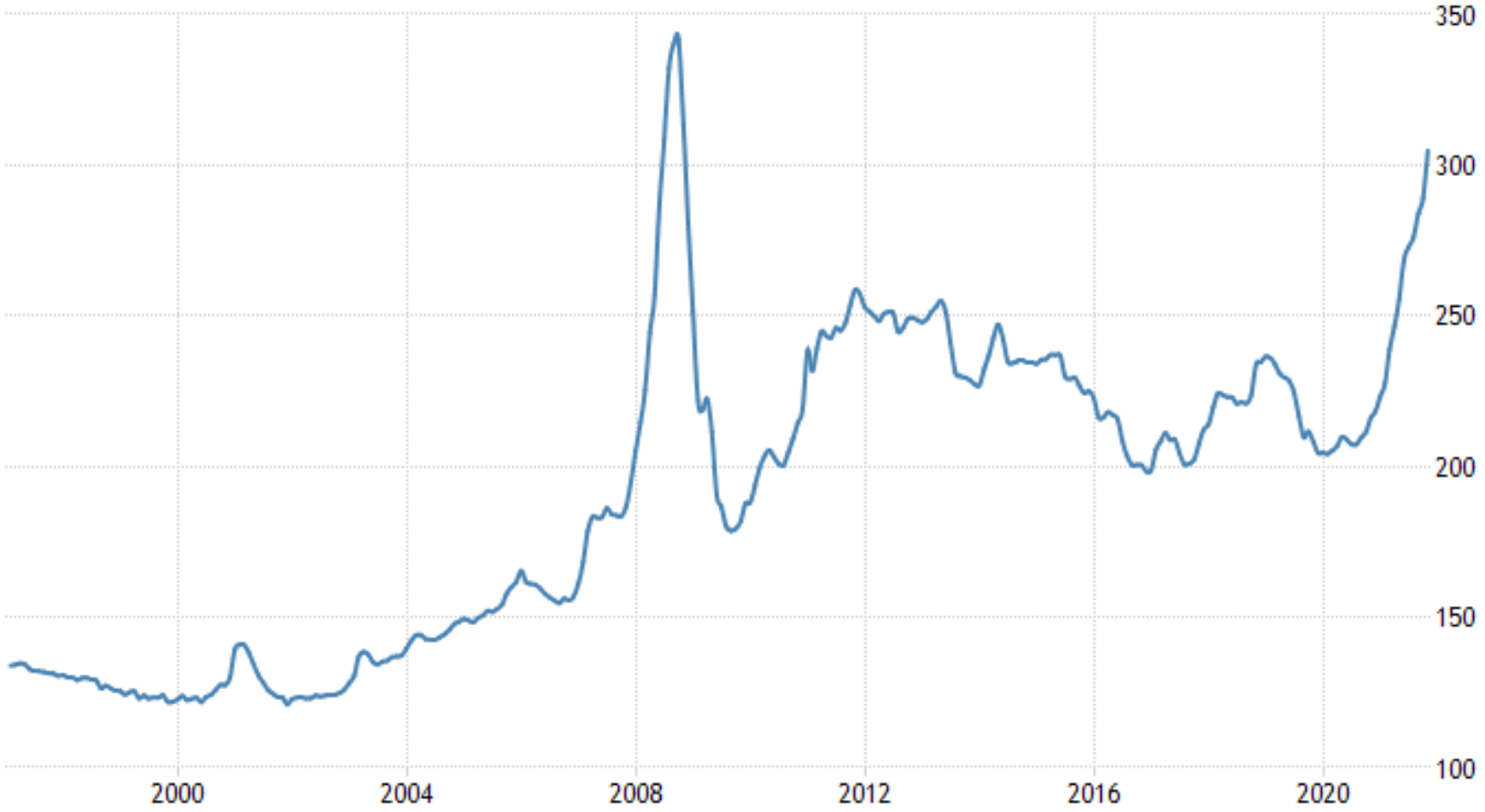
State: Ohio
Number of sites: 228
Rotation: Corn Following Soybean

| | |
|---|---|
| Nitrogen Price ($/lb): | 0.91 |
| Corn Price ($/bu): | 5.50 |
| Price Ratio: | 0.17 |
| MRTN Rate (lb N/acre): | 151 |
| Profitable N Rate Range (lb N/acre): | 139 - 162 |
| Net Return to N at MRTN Rate ($/acre): | $264.88 |
| Percent of Maximum Yield at MRTN Rate: | 96% |
| Urea (45% N) at MRTN Rate (lb product/acre): | 335 |
| Urea (45% N) Cost at MRTN Rate ($/acre): | $137.41 |

2022



# United States - Producer Price Index by Commodity for Chemicals and Allied Products: Agricultural Chemicals and Chemical Products




Price and availability is a major concern for many agricultural crop protection products.

Source: https://tradingeconomics.com/united-states/producer-price-index-by-commodity-for-chemicals-and-allied-products-agricultural-chemicals-and-chemical-products-fed-data.html#:~:text=and%20Chemical%20Products-,United%20States%20%2D%20Producer%20Price%20Index%20by%20Commodity%20for%20Chemicals%20and,the%20United%20States%20Federal%20Reserve.

# Crop Share Arrangements

| | 2022 | 2021 |
|---|---|---|
| Price ($/bu) | $5.65 | $4.60 |
| Yield (bu/acre) | 180 | 180 |
| Expenses (excluding land) | $771 | $530 |
| Revenue | $1,017 | $828 |
| **1/4 Revenue Share** | **$254** | **$207** |
| Profit | $(8) | $91 |

Need to have conversations with landowners if you are using a crop share arrangement.

The risk profile has changed dramatically.
Possible solutions: Move to cash rent or negotiate a portion of the expenses to the landowner.

# Reducing Input Costs

- Not an easy task and will require creativity.
  - Soil testing – know what you have.
  - Alternative nutrient sources – poultry litter, manure, other.
  - Eliminate products that are not contributing to sufficient yield gains relative to costs.
  - You will need a plan A, B, C…. If “typical” inputs are not available.
  - Crop rotation.
    - High input cost versus low input cost commodities.
    - Profitability comparison and mange price risk.
  - Crop share leases – balance the risk/reward.
  - Maximum Return to Nitrogen (MRTN).
  - Protect output prices / manage the margin.

# Need for Risk Management

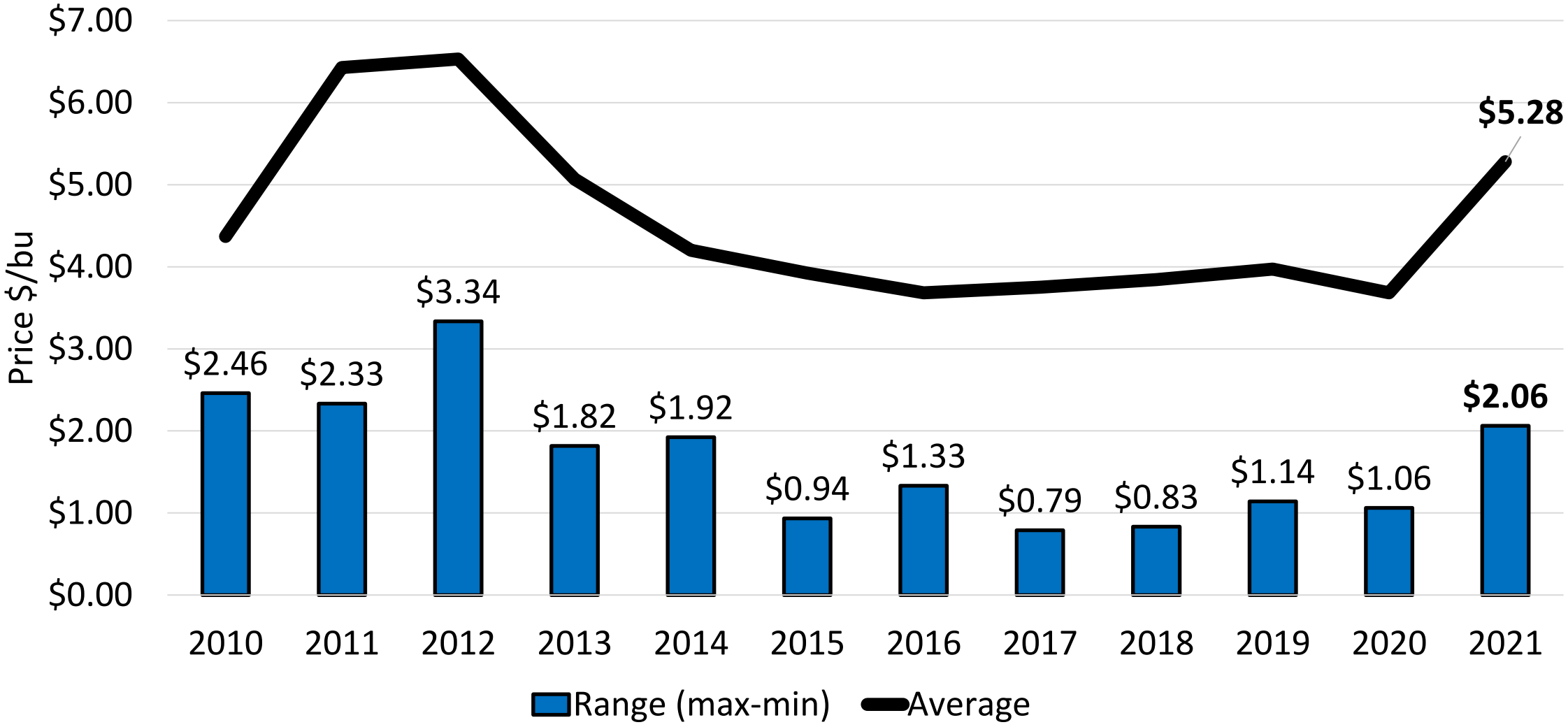
- For row crop producers, there are more risk management tools available to manage output price risk than input price risk.

- Risk management tools need to be utilized this fall/winter to avoid potential catastrophic outcomes.
  - Buy high input prices + corn & soybean price declines = substantial losses.
  - Crop insurance protection is still 1.5 months out!
    - July 1 to July 9: corn dropped from $6.16 to $5.15.

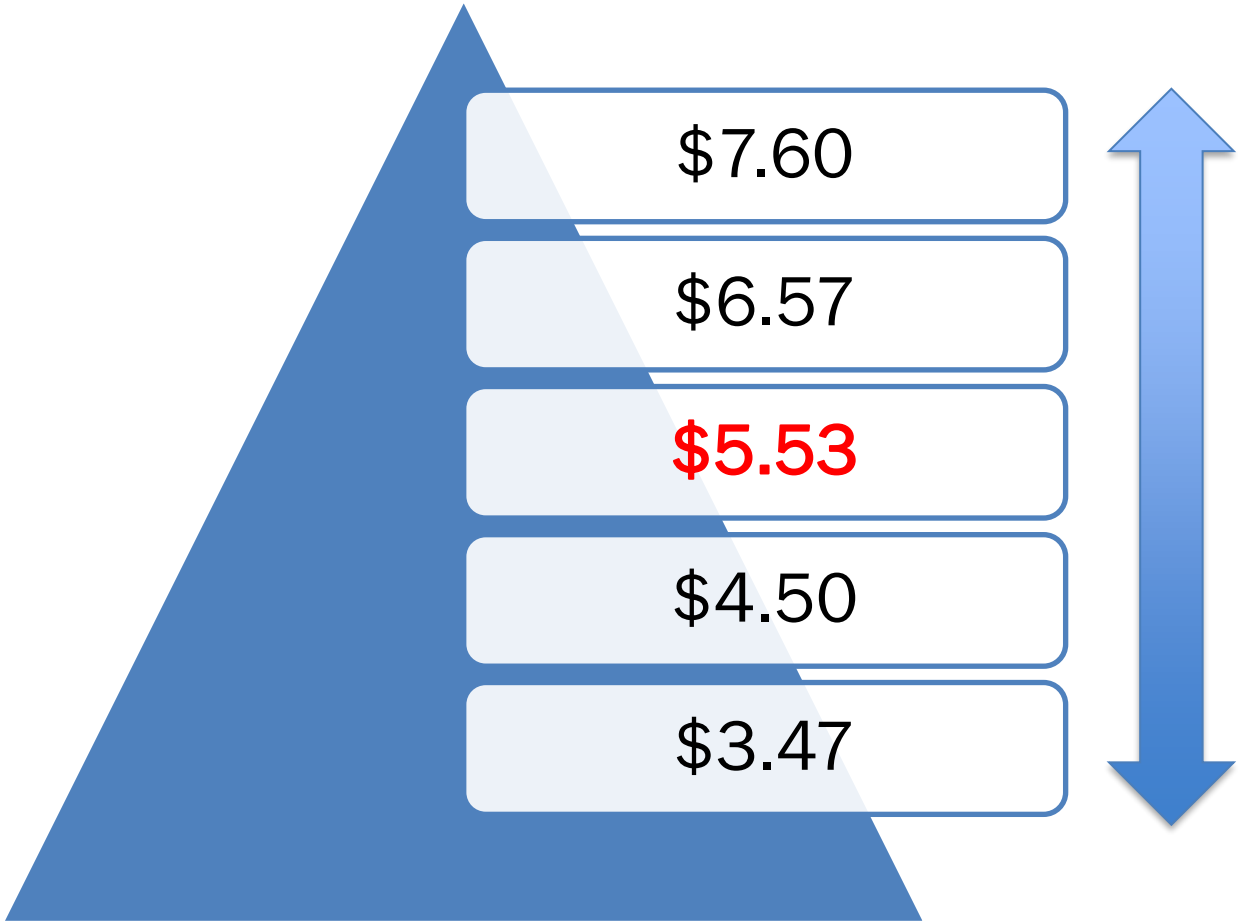
Corn, Soybeans, and Wheat

# PRICES

# Corn Average December Futures Price and Price Range (Max-Min), January to Contract Expiration plus USDA MYA Price

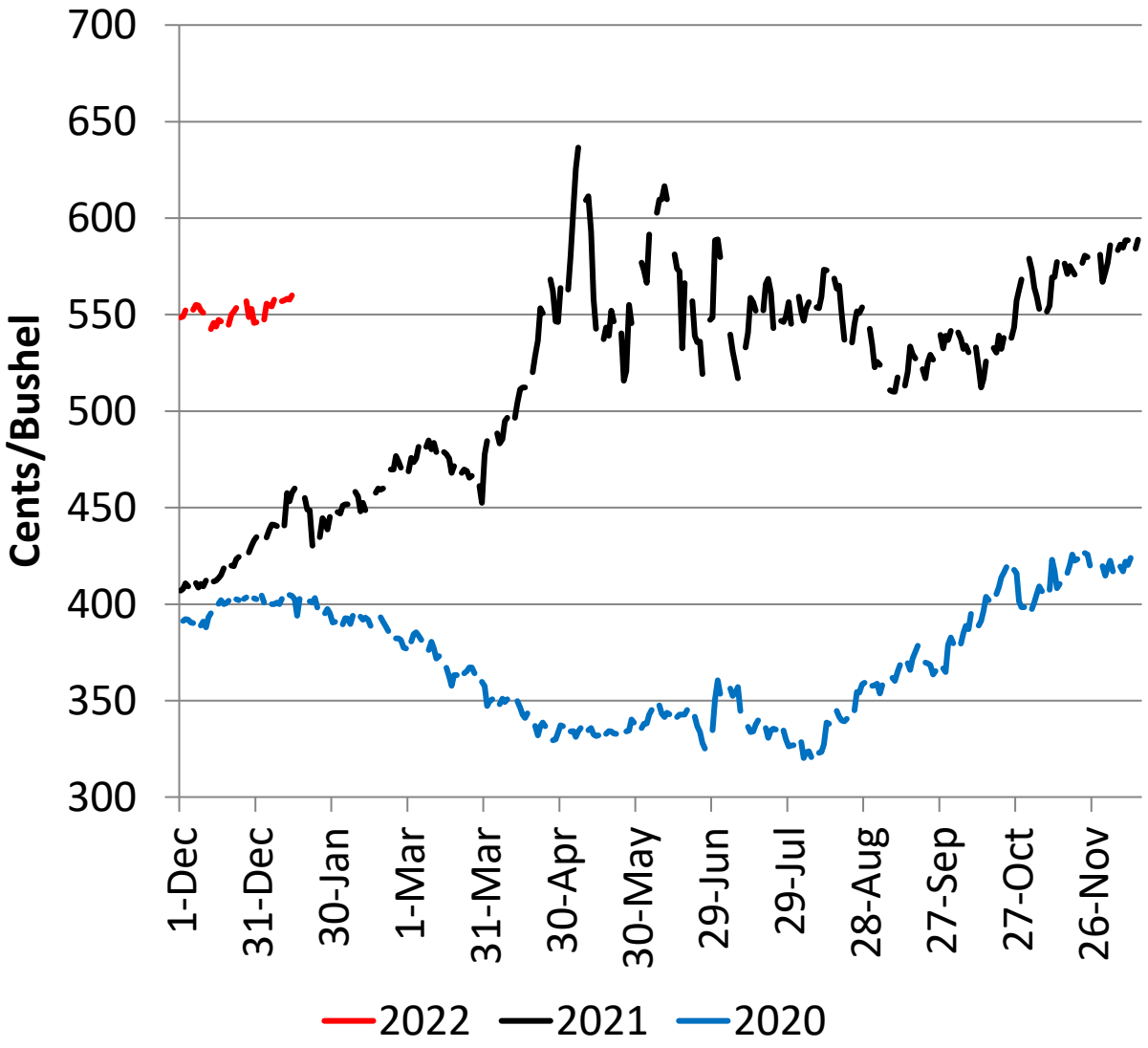


# What About Corn in 2022?

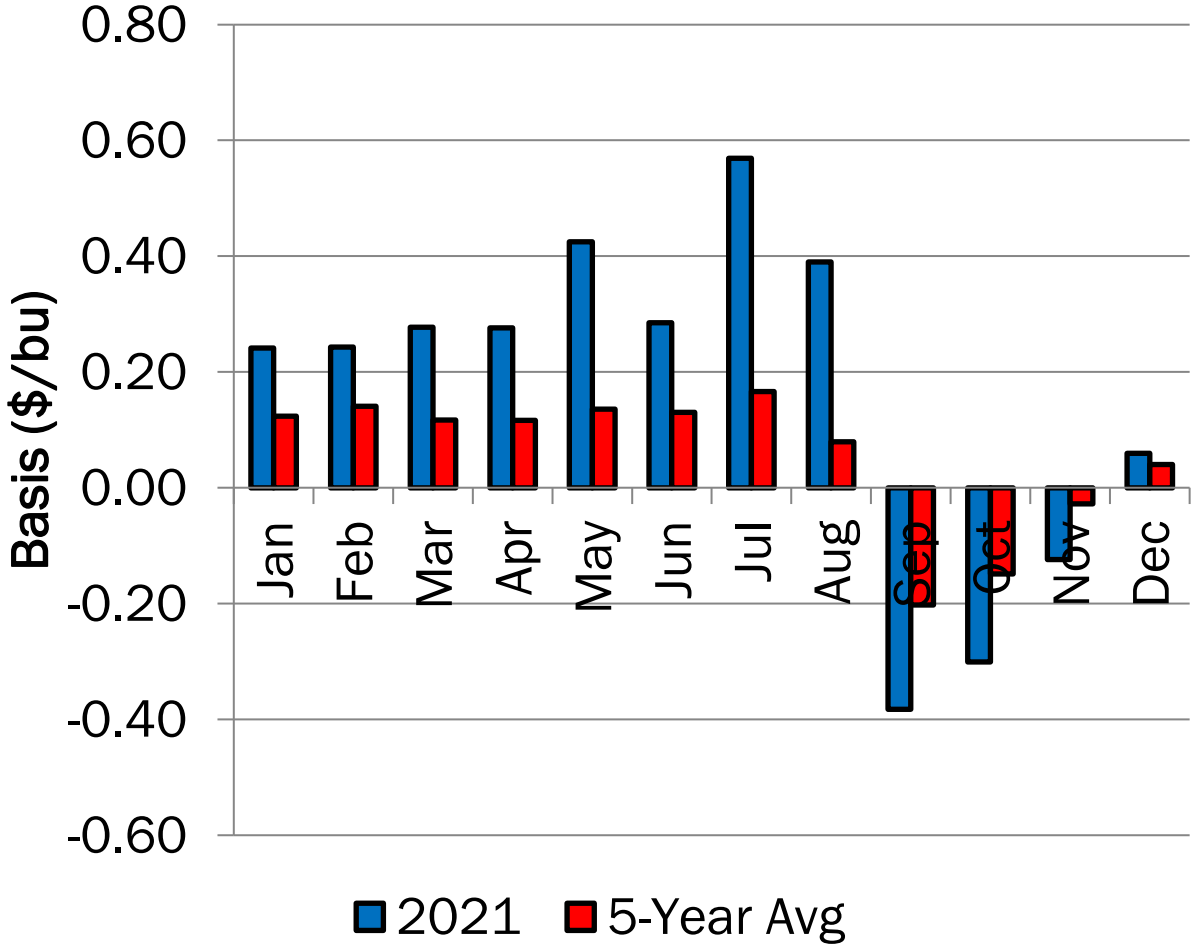



- December 2022 contract average since January 1 = **$5.53**
- 2021 Range of $2.06
- +/- $1.03
- +/- $2.06

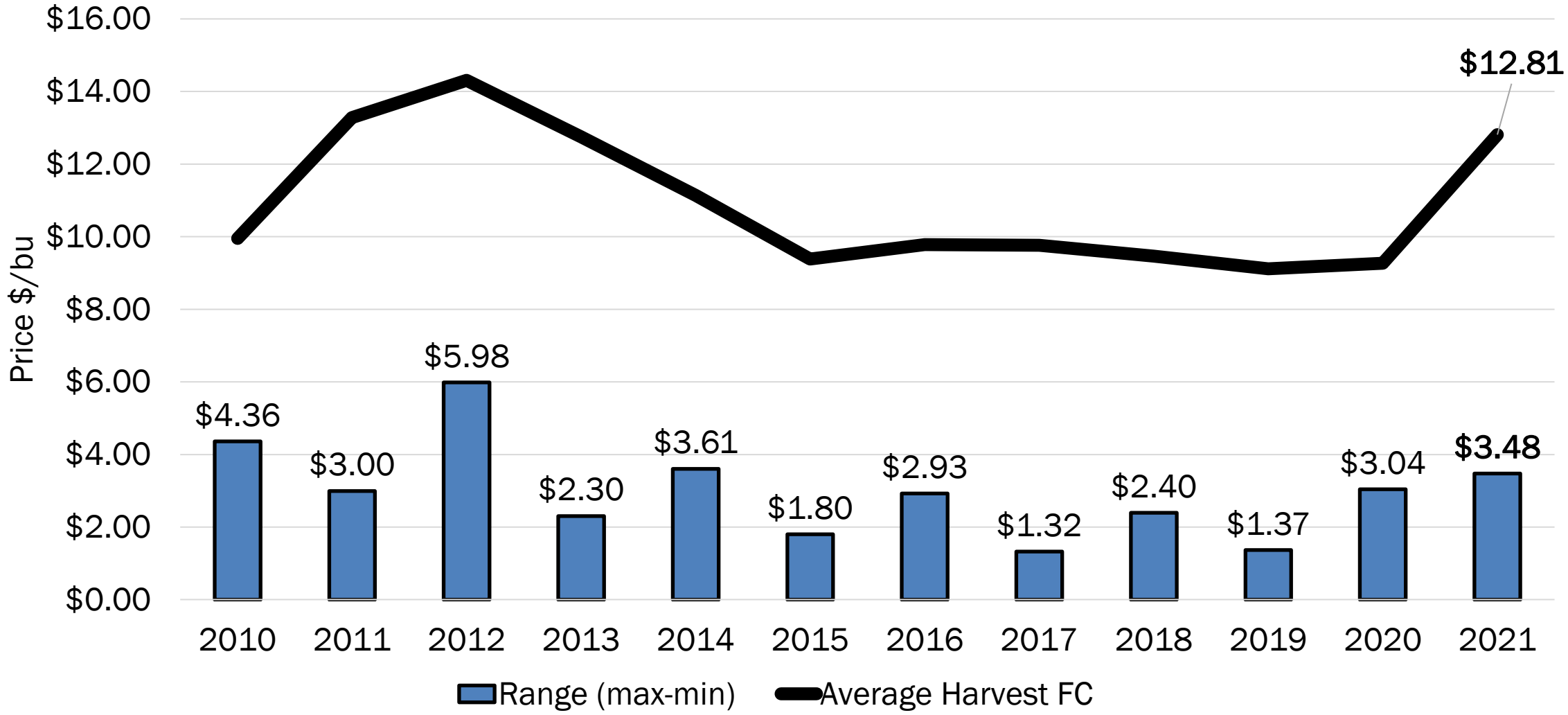
## December Corn Futures




## Tennessee Average Monthly Corn Basis (Elevators and Barge Points), 5-Year Average and 2021



# Soybean Average November Futures Price and Price Range (Max-Min), January to Contract Expiration plus USDA MYA Price

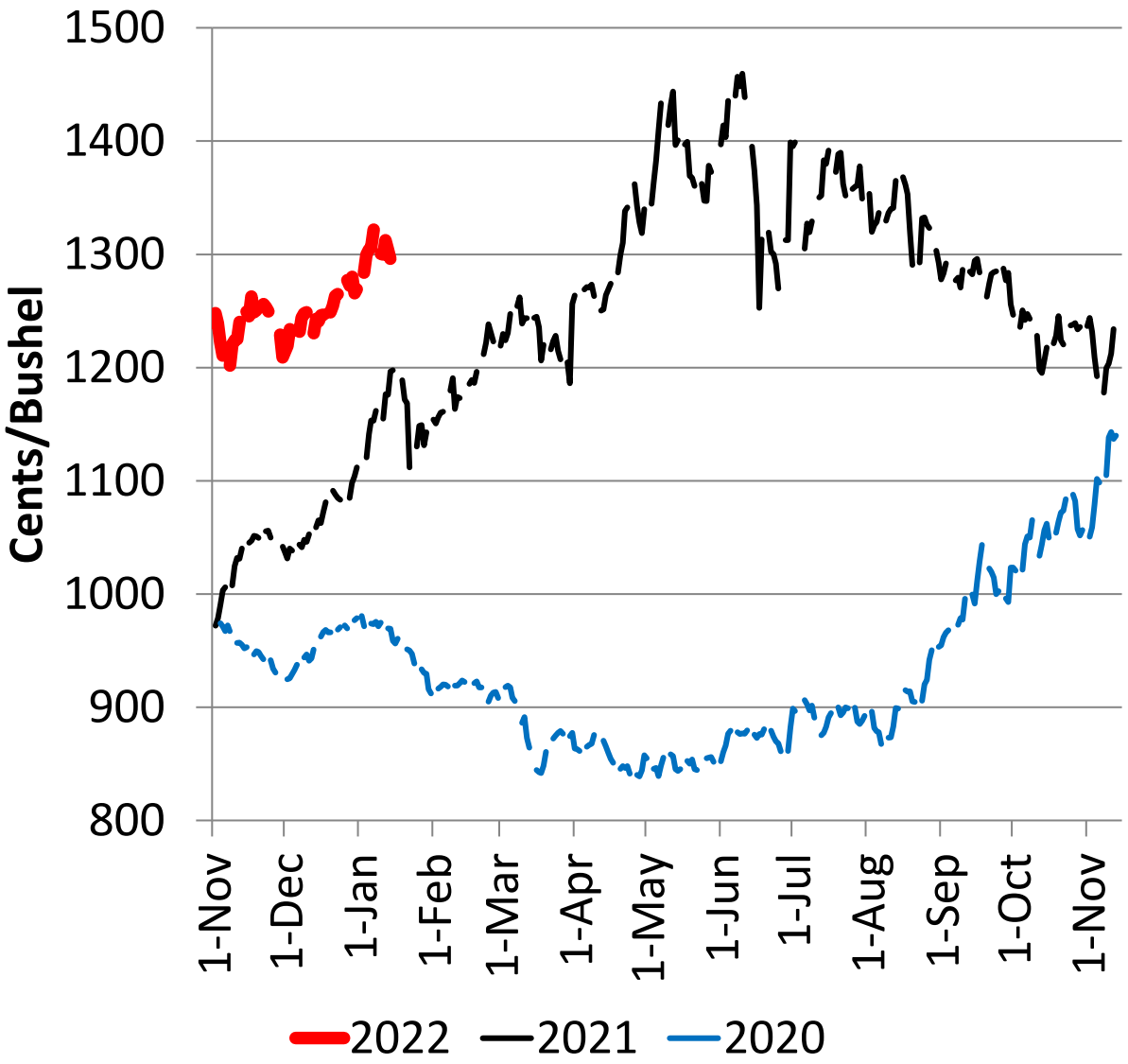



**Volatility is likely to persist in 2022.**

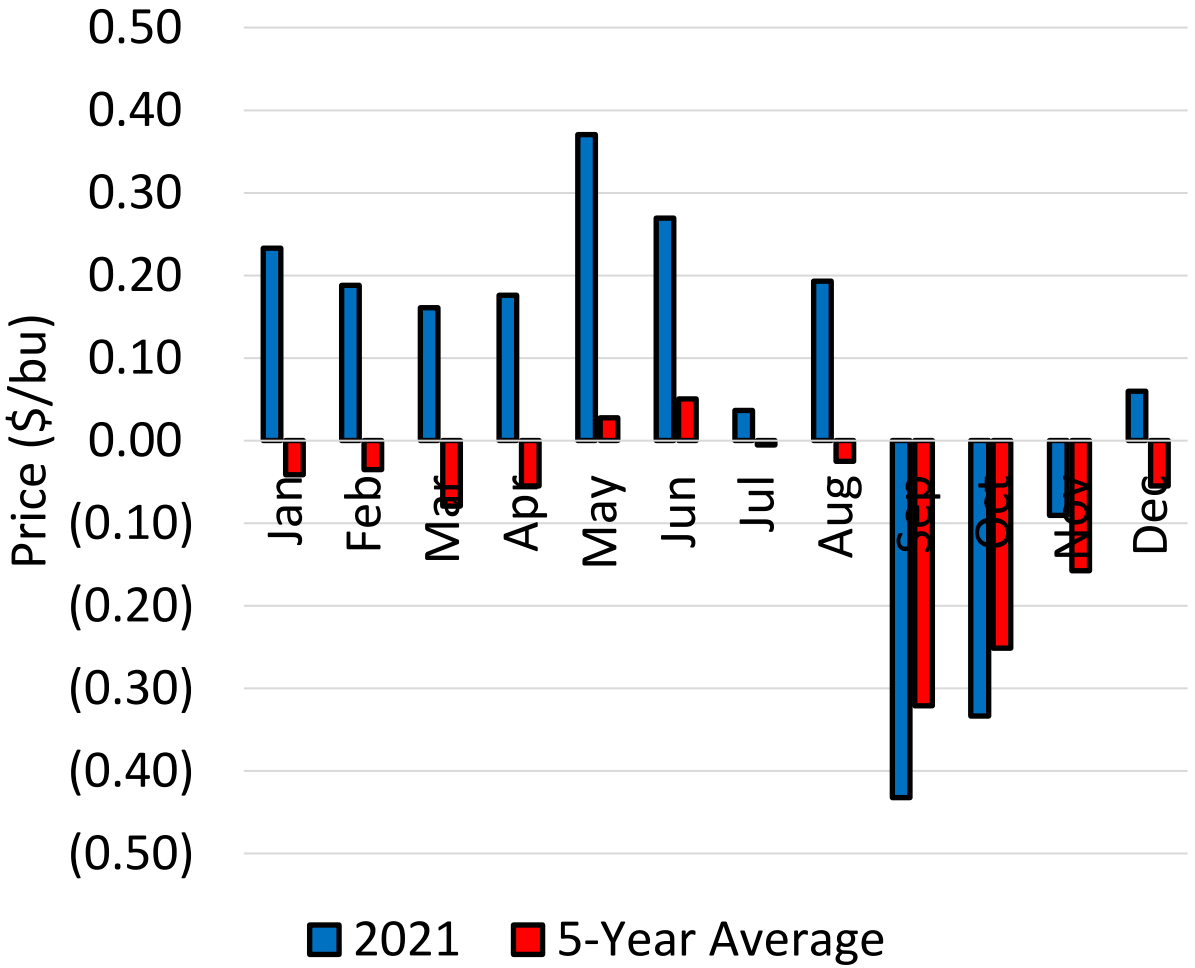
# What About Soybeans in 2022?


- November 2022 contract average since January 1 = **$13.02**
- 2021 Range of $3.48
- +/- $1.74
- +/- $3.48

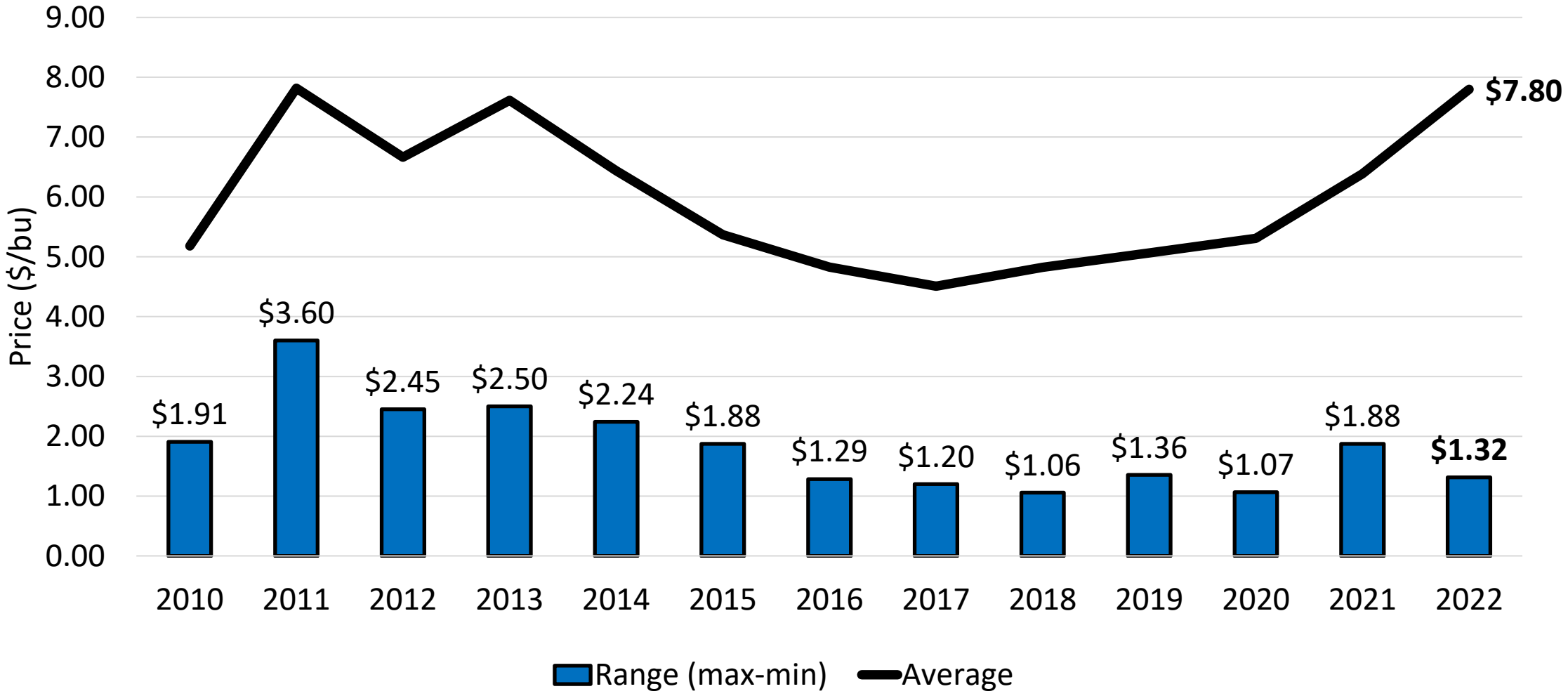
## November Soybean Futures




## Tennessee Average Monthly Soybean Basis (Elevators and Barge Points), 5-Year Average and 2021



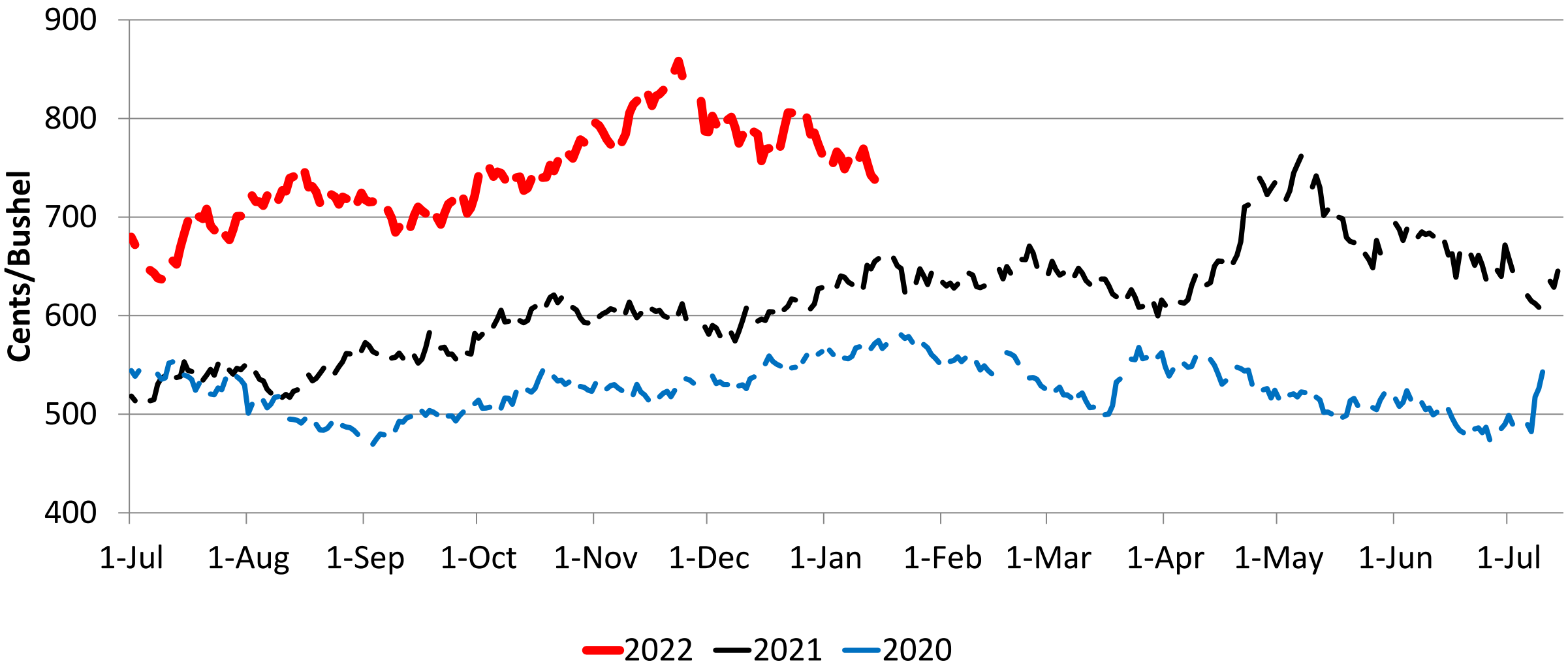
# Wheat Average November Futures Price and Price Range (Max-Min), October to Contract Expiration



# What About Wheat in 2022?


- July 2022 contract average since October 1 = **$7.80**
- 2021 Range of $1.88 ($1.22 so far in 2022)
- +/- $0.94
- +/- $1.88

# July Wheat Futures



# 2022 Factors

- South America
- US plantings
- Weather
- Global production
- Interest and exchange rates
- Global / US economic growth
- China demand and policy
- Trade
- Domestic Policy
- COVID-19 Disruptions


Bridging Risk Gaps and Managing Profit

# MARKETING

## 2022 Corn, No-Till, Non-Irrigated Budget

| | Unit | Quantity | Price | Total |
|---|---|---|---|---|
| ***Revenue[1]*** | | **Gross Revenue ($/Acre)** | | |
| Corn | Bu/acre | 180 | $5.65 | $1,017.00 |
| | | | **Total Revenue** | **$1,017.00** |
| ***Variable Expenses*** | | | | |
| Seed[2] | Thous. | 32 | $3.65 | $116.80 |
| Fertilizer & Lime (Table 1) | Acre | 1 | $328.63 | $328.63 |
| Chemical (Table 2) | Acre | 1 | $64.79 | $64.79 |
| Crop Scout or Consultant | Acre | 1 | $15.00 | $15.00 |
| Repair & Maintenance (Table 3) | Acre | 1 | $43.89 | $43.89 |
| Fuel, Oil & Filter (Table 3) | Acre | 1 | $19.66 | $19.66 |
| Operator Labor (Table 3) | Acre | 1 | $13.98 | $13.98 |
| Crop Insurance[6] | Acre | 1 | $15.91 | $15.91 |
| Operating Interest [7] | % | $618.66 | 4.35% | $13.46 |
| | | | **Total Variable Expenses** | **$632.12** |
| | | | **Return Above Variable Expenses** | **$384.88** |
| ***Fixed Expenses*** | | | | |
| Machinery | | | | |
| Capital Recovery (Table 3) | Acre | 1 | $103.81 | $103.81 |
| General Overhead | Acre | 1 | $20.00 | $20.00 |
| Cash Rent[8] | Acre | 1 | $170.00 | $170.00 |
| Management Labor | Acre | 1 | $25.00 | $25.00 |
| | | | **Total Fixed Expenses** | **$318.81** |
| | | | **Total Expenses** | **$950.93** |
| | | | **Return Above Specified Expenses** | **$66.07** |

# What do you have invested in the crop?

# Corn - Net Return Table ($/acre): $950/acre COP

| Price ($/bu) | Yield (bu/acre) 150 | 160 | 170 | 180 | 190 | 200 | 210 | 220 | 230 | 240 | 250 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.25 | (463) | (431) | (398) | (366) | (333) | (301) | (268) | (236) | (203) | (171) | (138) |
| 3.50 | (426) | (391) | (356) | (321) | (286) | (251) | (216) | (181) | (146) | (111) | (76) |
| 3.75 | (388) | (351) | (313) | (276) | (238) | (201) | (163) | (126) | (88) | (51) | (13) |
| 4.00 | (351) | (311) | (271) | (231) | (191) | (151) | (111) | (71) | (31) | 9 | 49 |
| 4.25 | (313) | (271) | (228) | (186) | (143) | (101) | (58) | (16) | 27 | 69 | 112 |
| 4.50 | (276) | (231) | (186) | (141) | (96) | (51) | (6) | 39 | 84 | 129 | 174 |
| 4.75 | (238) | (191) | (143) | (96) | (48) | (1) | 47 | 94 | 142 | 189 | 237 |
| 5.00 | (201) | (151) | (101) | (51) | (1) | 49 | 99 | 149 | 199 | 249 | 299 |
| 5.25 | (163) | (111) | (58) | (6) | 47 | 99 | 152 | 204 | 257 | 309 | 362 |
| 5.50 | (126) | (71) | (16) | 39 | 94 | 149 | 204 | 259 | 314 | 369 | 424 |
| 5.75 | (88) | (31) | 27 | 84 | 142 | 199 | 257 | 314 | 372 | 429 | 487 |
| 6.00 | (51) | 9 | 69 | 129 | 189 | 249 | 309 | 369 | 429 | 489 | 549 |
| 6.25 | (13) | 49 | 112 | 174 | 237 | 299 | 362 | 424 | 487 | 549 | 612 |
| 6.50 | 24 | 89 | 154 | 219 | 284 | 349 | 414 | 479 | 544 | 609 | 674 |
| 6.75 | 62 | 129 | 197 | 264 | 332 | 399 | 467 | 534 | 602 | 669 | 737 |
| 7.00 | 99 | 169 | 239 | 309 | 379 | 449 | 519 | 589 | 659 | 729 | 799 |

When am I making money?

# Marketing 2022 – Identify risk gaps and fill

- How much can you store?
- Crop insurance.
- Futures or options.
- Cash sales or contracts.

# Example #1: Bridging the price risk gap until crop insurance

- Buy a $5.00 December 2022 put option for 23 cents, sets a $4.77 per bushel futures price floor.
  - If Dec FC>$5.00, then option has no intrinsic value.
  - If Dec FC<$4.77, then value = $4.77-Dec FC
- Assuming a projected yield of 180 bu/acre
  - Provides a projected revenue floor of $858/acre (180 bu/acre x $4.77).
  - $950 - $851 = $99/acre, unprotected if yield is achieved.
- Cost for 1,000 acres
  - 180 bu acre x 1,000 = 180,000 bu
  - 180,000 x $0.23 = $41,400
- Remove 86% of the futures price risk ($4.77/$5.56)
- After crop insurance prices are determined:
  - Can keep the put option.
  - Exit the position and recoup the time value of the option.

# Checklist

- Write down your risk management and marketing plan.
- Identify risk gaps / key times of the year.
- Evaluate storage versus anticipated production.
- Identify tools you are comfortable with.
- Seek expert advice.
- Execute.
- Revisit your plan regularly.

# Concluding Thoughts

- Prices are strong, but volatility will continue, and there is downside price risk.
- Between now and planting, nobody knows definitively if input prices will be higher, the same, or lower than current prices.
- The risk profile has dramatically changed compared to recent years.
- Crop insurance price determination is 1.5 months away, a lot can change.
- If you are buying inputs, protect the value of the output through risk management.
- Inaction is a decision, usually not the correct one.

## Current Carbon Market Programs (and Growing)


Potential for increased revenue?

# CARBON MARKETS AND CARBON CREDITS

# What We Currently Know

- Contracts are being offered in the private sector.
- Massive variation in payment mechanisms, terms, and conditions in contracts.
- Measurement, verification, registration and carbon credit retirement processes need clarity.
- Individual contracts can be evaluated on financial merits.
  - Revenue less cost, accounting for risk.

# Select Large Companies Carbon Neutrality Commitments

**Amazon** announced a goal to be carbon neutral by **2040**.

**Apple** announced its plan to become carbon neutral across its entire business, manufacturing supply chain and product life cycle by **2030**.

**BP** set a goal to become carbon neutral by **2050** at the latest.

**FedEx** announced a goal to achieve carbon-neutral operations globally by **2040**.

**Ford Motor Company** announced in June 2020 that it aims to achieve carbon neutrality by **2050**.

**General Motors**, the largest automaker in America, announced that it plans to be carbon neutral by **2040**.

**IBM** announced that it will achieve net-zero greenhouse gas emissions by **2030**.

**Ikea** has pledged to be "climate positive" by **2030** -- a term that means that it plans to reduce more greenhouse gas than it emits.

**Intuit** announced in September 2019 that it planned to be a climate positive company by **2030**.

**Microsoft** has taken the carbon-neutral pledge -- the software giant announced in January 2020 that it would be carbon negative by **2030**.

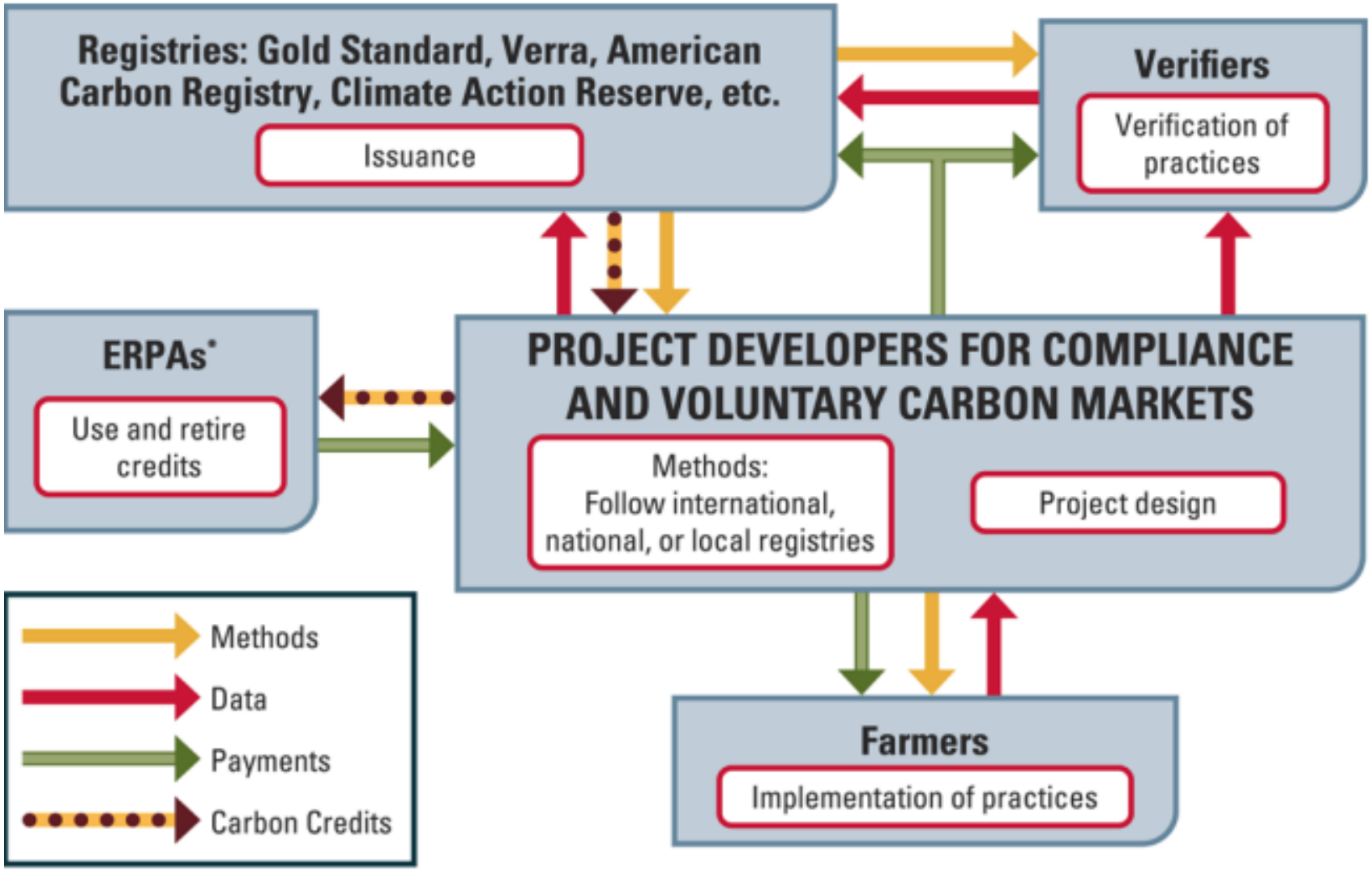
**PepsiCo** pledged to achieve net-zero emissions by **2040**.

**Unilever** announced its plan to achieve net zero emissions from all its products by **2039**.

**Verizon** announced that it will go carbon neutral by **2035**.

**Walmart** -- zero emissions by 2040 and to protect, manage or restore 50 mil acres of land and one million sq. miles of ocean by **2030**.

## Figure 1. Traditional Carbon Offset Generation




* ERPAs: Emission Reduction Purchase Agreements

Source – Plastina- https://www.extension.iastate.edu/agdm/crops/pdf/a1-77.pdf

# Carbon Contracts

- Enrollment length varies but most carbon programs are 1 to 10-year plus contracts with potential additional retention period of continued practices.
- Baseline / additionality varies.
- Eligible locations vary.
- Minimum acres to enroll.
- Penalty to withdrawal.
- Don’t typically pay for additional costs (e.g., machinery, inputs, verification).
- Land ownership changes?
- New technology required for data collection and reporting (e.g. Climate FieldView, remote sensing, other precision ag technologies)

# What Should Producers Look for in a Contract?

- Land use (pasture, forest, cropland) and crop mix (corn, soybean etc.)
- What are you being paid for
- Practices to be implemented
- Length of contract
- Reporting / data sharing /validation requirements
- Property access requirements
- Payment mechanism
- Payment timing
- Will payments cover implementation costs?
- Does this restrict participation in other programs?
- Clauses and definitions
- Exit / failure to deliver

Ensure that you can comply with the contract for the entire life of the agreement.

Beware of fine print and definitions.

Always obtain legal advice.

# Partial Net Returns Analysis

- Quantify the expected change in revenue and expenses as a result of the entrance, implementation, and compliance costs of the contract.

- Revenue = Price of carbon ($/ton or $/acre) x Quantity (tons or acres)
  - Short term / long term production reduction?

- Expenses = $/acre plus $/hr costs plus fixed costs
  - Capital purchases
  - Production expenses
  - Transaction costs
  - Opportunity cost of time

- Need to account for risk / uncertainty!

# Summary

- Carbon markets and prices are still in the developmental stage.
- Driven by companies focused on climate change, environmental consumers and shareholders (will these targets be realized?).
- Additionality, verification, permanence, and enforceability are vital and need clarity.
- Current prices may not offset the cost and economic risks to implement the contract…RISK VS. REWARD
  - What is the producer share of revenue?
- What is a fair price?
- Should landowners or producer's signup now?……probably not until more information is available, but you can evaluate the financial merits of the contract.

# Thank you

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“Social media is to intelligence what McDonalds is to nutrition.”