



## Fuel and Fertilizer Update:

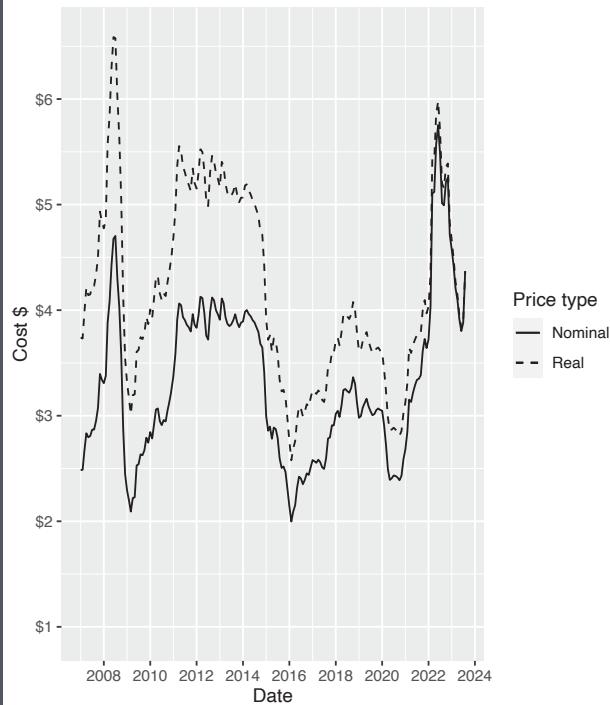
What to expect in 2023 and 2024

Gregg Ibendahl - K-State

2023-09-20



Highway Diesel Price

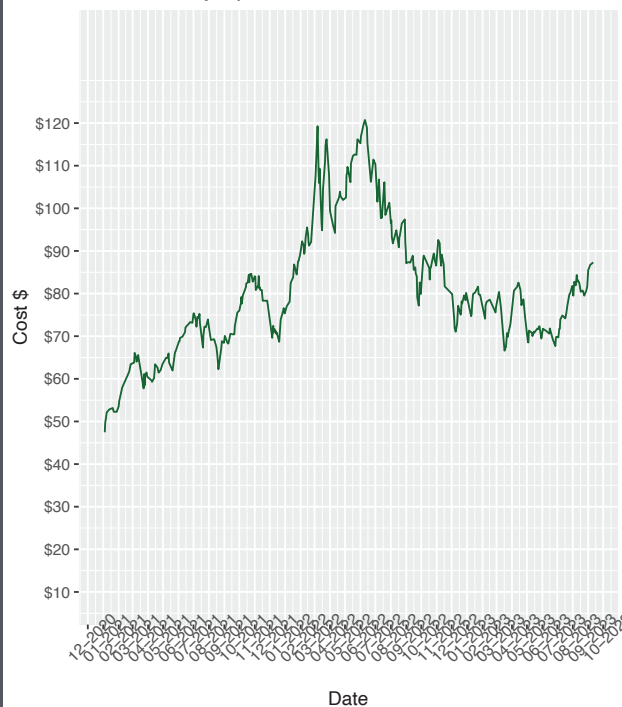


## Diesel prices are on the upswing

- After declining in price for over a year, prices are going up
- Gasoline is similar
- World supply is a concern
- Domestic refinery capacity is still constrained

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OK WTI Daily Spot Prices



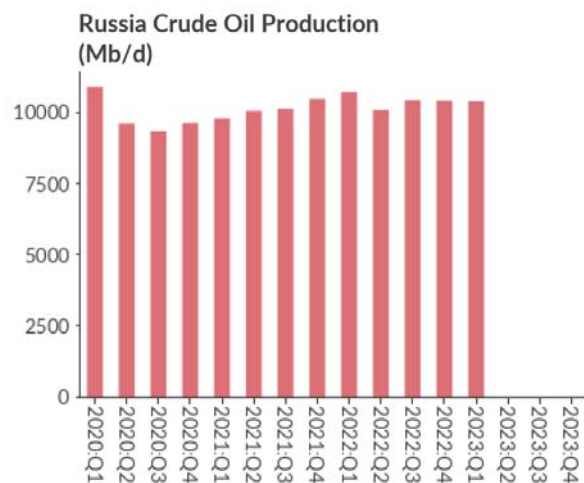
## The diesel price mirrors the oil price

- Prices started rising after Covid shutdown ended
- Rapid increase leading up to Russia/Ukraine war
- Bounce effect soon after
- Slow decline until this summer
- Increase of nearly \$20/barrel since

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# What has been happening across the world to affect oil prices?

- Supply cuts by both Russia and Saudi Arabia
  - 2 of the largest oil exporters in the world
  - 1.3 million barrels a day cut extended through December
  - 1% of world's supply
- Flooding in Libya
  - 7th largest OPEC member
- Strategic petroleum reserve
  - lowest level in 40 years



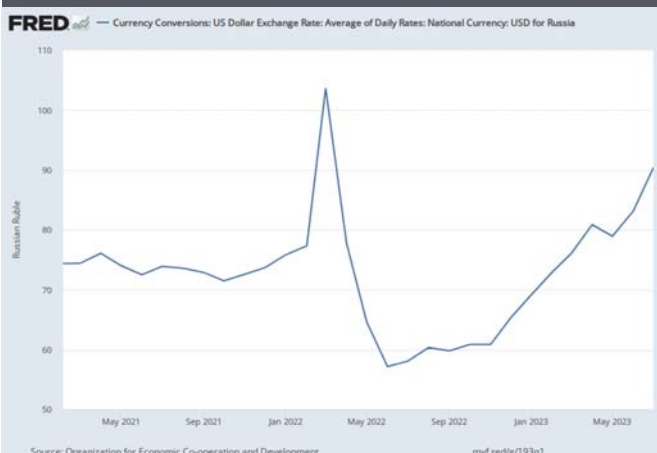
## Little change in production

- Oil is a fungible commodity
  - Difficult to make tariffs work
- Selling more to India, China and other countries
- EU price caps unlikely to be very effective
  - Russia faces world market price
  - Perhaps some discounts to sell to China

## Russia and Saudi Arabia supply cuts have been effective (so far)

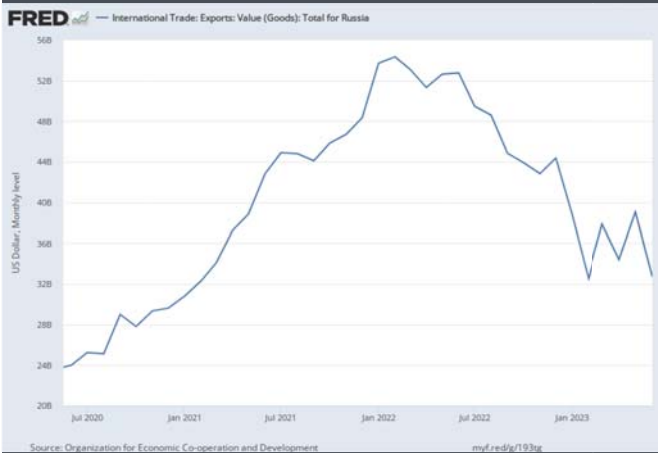
- Of the 1.3M barrels/day cut
  - Russia - 300,000
  - Saudi Arabia - 1M
- Price increase of \$20 barrel
- Just like tariffs are difficult to enforce, price collusion (i.e. cartels) don't work too well either
  - better chances with only 2 players
- Russia, as a major oil exporter, has certainly benefited financially
  - Also enhances relationship with Saudi Arabia
  - China too (but from selling oil)

## Russia's economy



- War initially strengthened Ruble
- Ruble has weakened since last summer
  - At current exchange rate, a Rubble is only worth a penny
- US dollar remains the world currency
- Russia's plan to move away from USD not off to a good start
  - Russia has billions in India's banks that it is hard pressed to use
  - Russia would like to make the Chinese Yuan an oil trading currency
    - not there yet

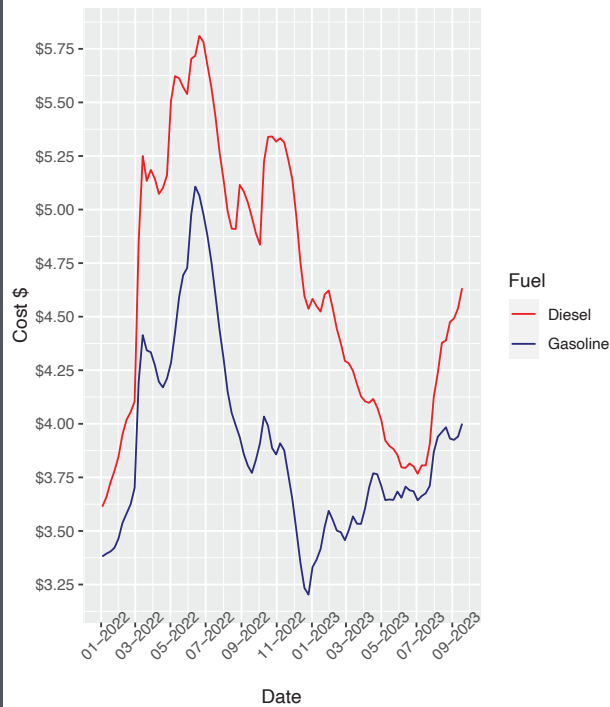
## Russian export values



- Declined (in terms of USD)
- Volume wise - probably similar to before the war
- Exchange rate effects

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## Highway Fuel Prices

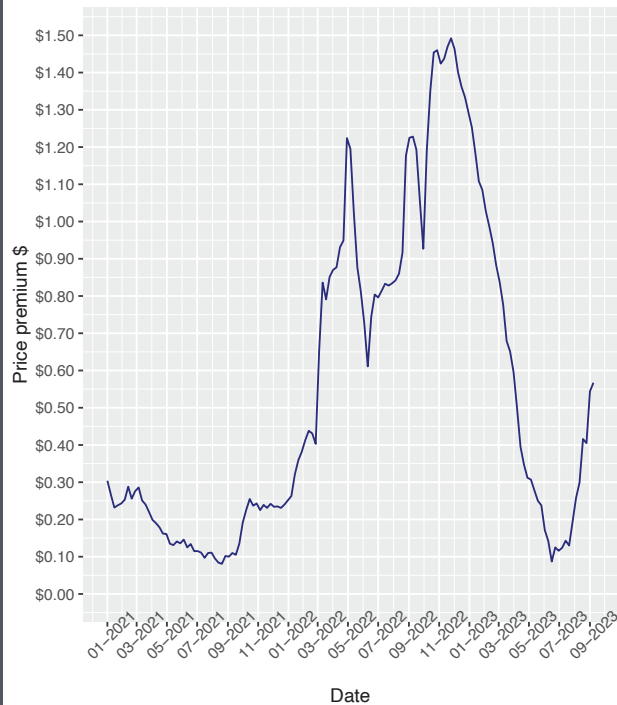


## Gas and Diesel prices

- Fuel prices have declined along with oil prices
- And risen just like oil prices
- Diesel prices have risen the most since the summer
- Diesel has outpaced oil

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Diesel to Gas Premium

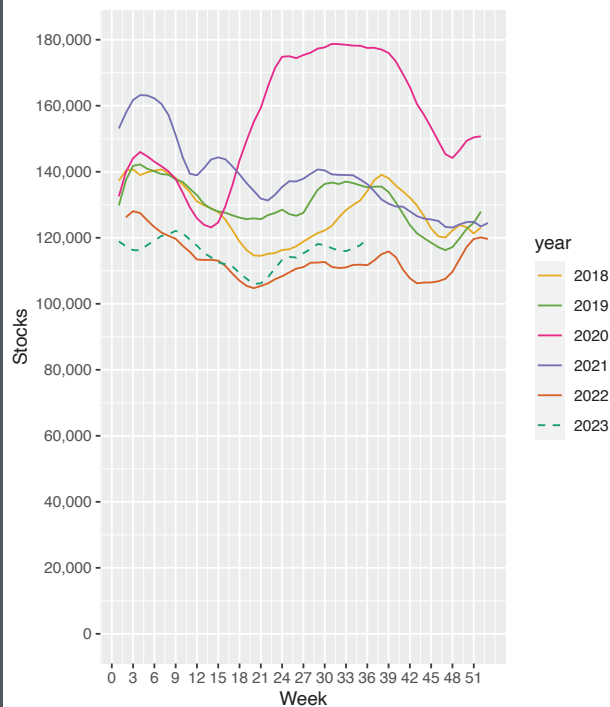


## Diesel premium

- The diesel premium reached record levels last fall
- Declined to more typical levels at the beginning of summer
- The premium has since increased
  - Now at \$0.50
  - About twice historical levels

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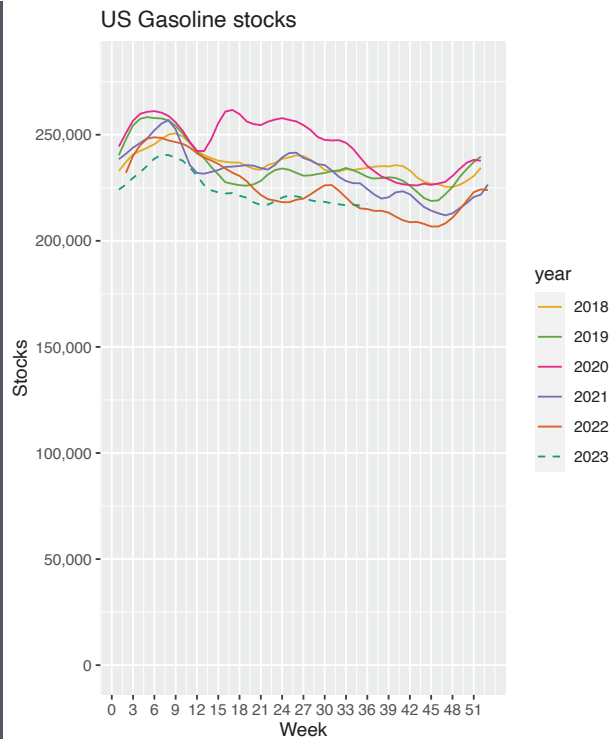
US Diesel stocks



## Very low diesel stocks

- Diesel inventories were well below normal the entire year last year
- Inventory situation will take a long time to correct
- It might correct quicker if we enter a recession
- Any hiccup in the refinery system tends to spike prices

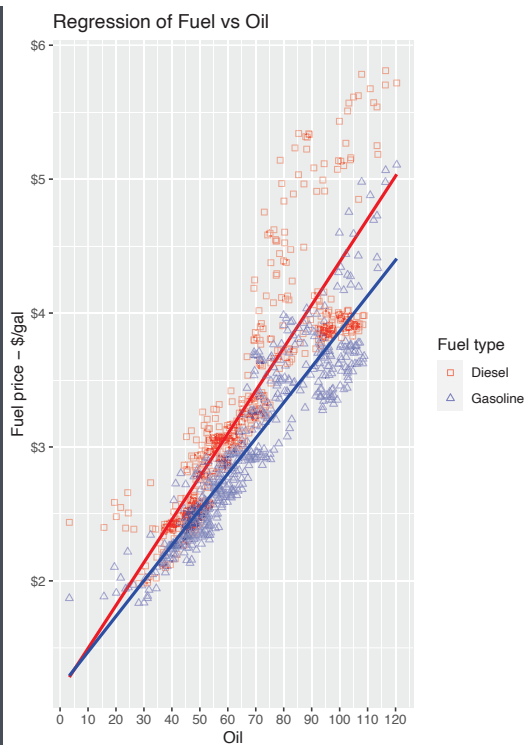
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## Gasoline stocks are low too

- not as bad as diesel
- part of the reason we haven't seen refineries shift more production to diesel

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## Where fuel prices should be

- \$90 dollar oil
- \$3.60 gas
- \$4.10 diesel
- Are the regression curves now different?
  - without more refinery capacity - Yes
  - the diesel line has shifted more vertical
  - notice the red points above the red line

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### West Texas Intermediate (WTI) crude oil price and NYMEX confidence intervals dollars per barrel

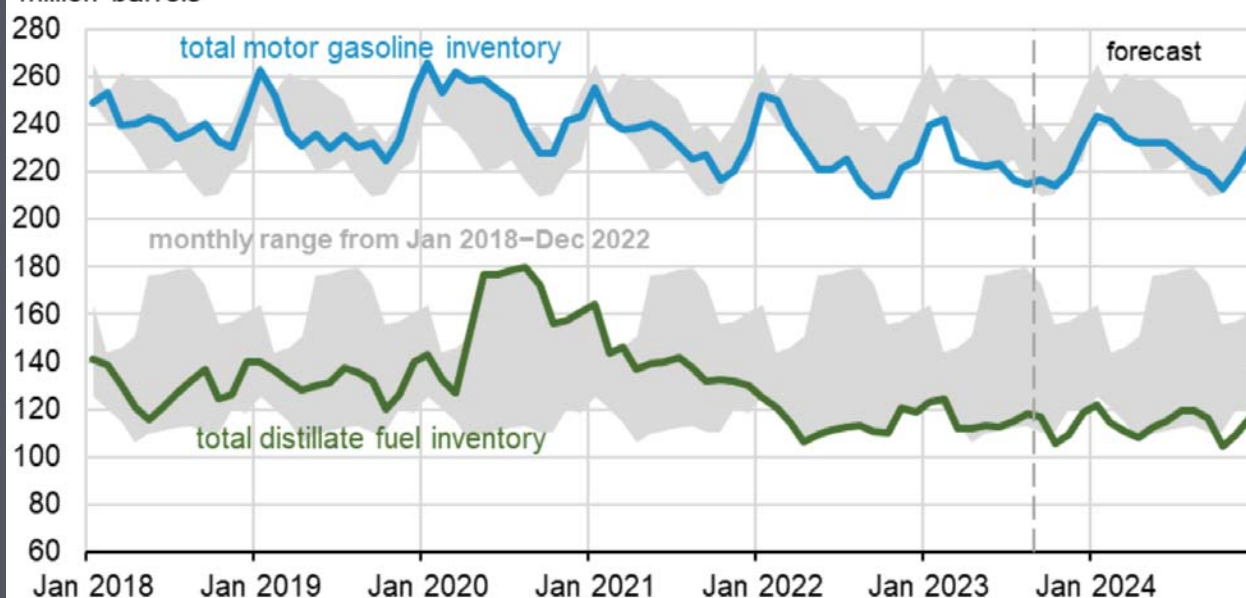


Data source: U.S. Energy Information Administration, Short-Term Energy Outlook, September 2023, CME Group, Bloomberg, L.P., and Refinitiv an LSEG Business

Note: Confidence interval derived from options market information for the five trading days ending September 7, 2023. Intervals not calculated for months with sparse trading in near-the-money options contracts.



### U.S. gasoline and distillate inventories million barrels

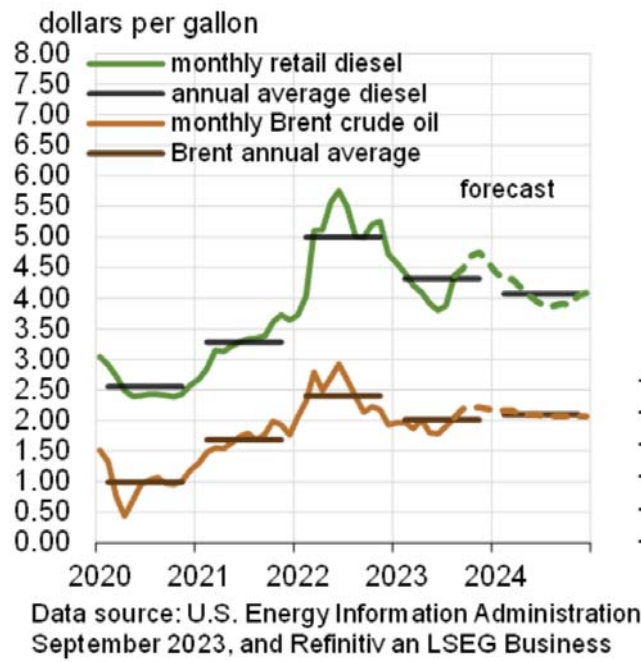


Data source: U.S. Energy Information Administration, Short-Term Energy Outlook, September 2023



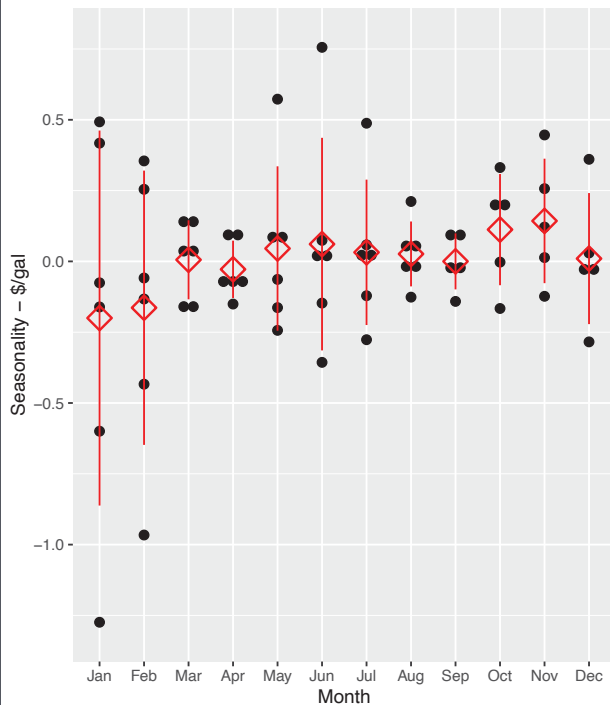


## U.S. diesel and crude oil prices

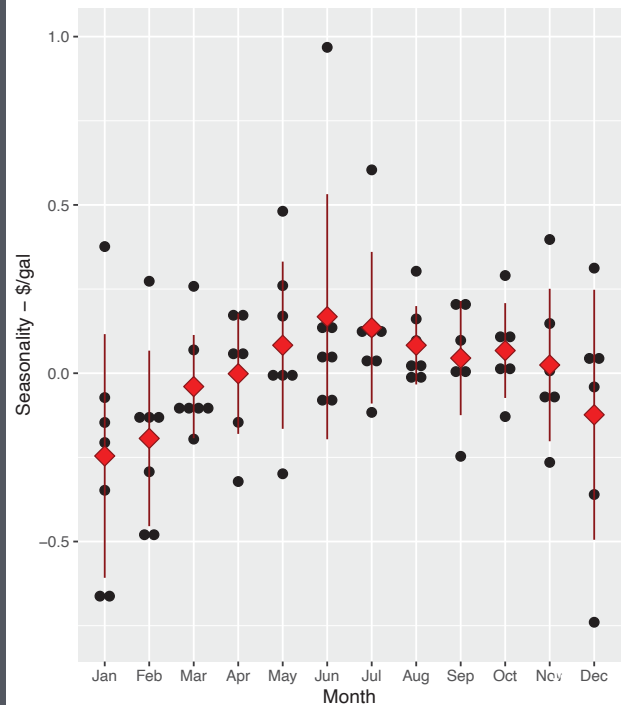


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### Diesel Seasonality



### Gasoline Seasonality



# Fertilizer

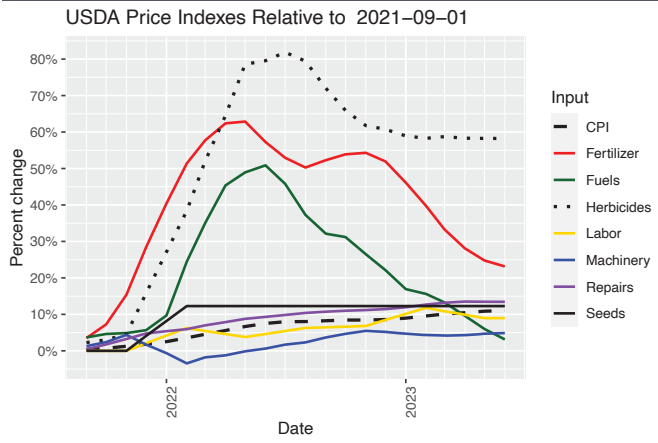
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## Comparison of Major Crop Expenses by Area

Percent of Total Expenses - 1978 and 2020

Year	Machinery	Fertilizer	Seed	Labor	Herbicide	Interest	Cash rent	Crop insurance
Central								
1978	36.5%	11.8%	6.8%	4.9%	2.4%	13.2%	4.4%	0.0%
2022	30.7%	20.6%	11.2%	2.9%	14.1%	2.9%	6.5%	3.6%
East								
1978	30.2%	13.3%	6.2%	3.8%	5.7%	10.6%	5.4%	0.0%
2022	29.3%	20.8%	12.7%	3.8%	12.9%	2.9%	7.0%	3.8%
West								
1978	41.8%	9.2%	7.3%	6.2%	4.4%	11.5%	3.2%	0.0%
2022	28.7%	20.2%	8.0%	2.7%	14.2%	3.4%	7.7%	7.0%

## Some decline in input costs but not all



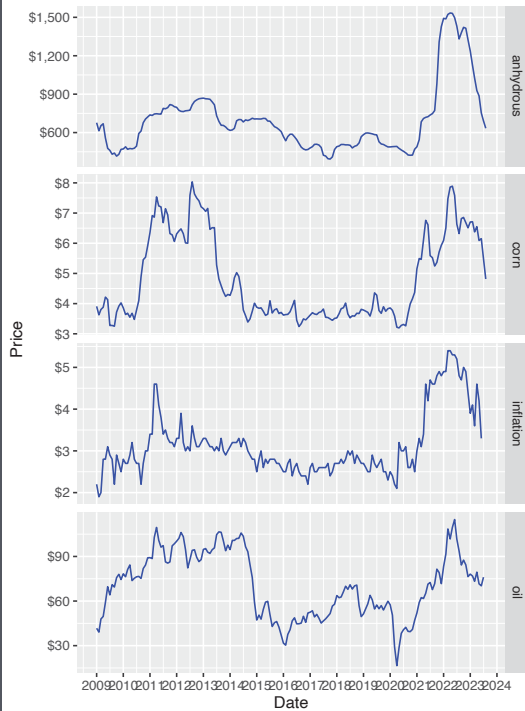
- Fertilizer is still 25% higher than 2 years ago
- Herbicides are 60% higher than 2 years ago
- Diesel prices appear headed upward
  - Diesel accounts for 6% of expenses

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## Russia is a major player in fertilizer

- Russia is one of the leading exporters as well
- Russia is the #3 producer of ammonia (N) in the world
  - fortunately any country with natural gas can make N
  - Haber-Bosch process
- Russia is the #2 producer of potash (K)
  - 20% of world production
  - U.S. imports nearly all of its P
- Russia is the #4 producer of phosphate rock (P)
  - 6% of world production
  - U.S. is the #3 producer

Historical Anhydrous, Corn, Inflation, and Oil Prices



## Model to predict prices

- Added inflation expectations to the model in fall of 2021
- Latest model (R-sq = 0.72)
  - Anhydrous ammonia (\$/ton) =
    - -318
    - + 48 \* corn (\$/bu)
    - + 2.75 \* oil\_6 mo lg (\$/barrel)
    - + 184 \* inflation expectations

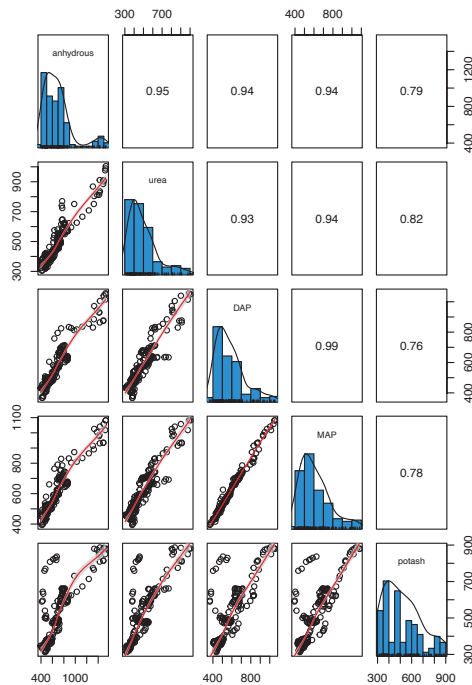
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Anhydrous Price – Actual vs Predicted



## Anhydrous prices

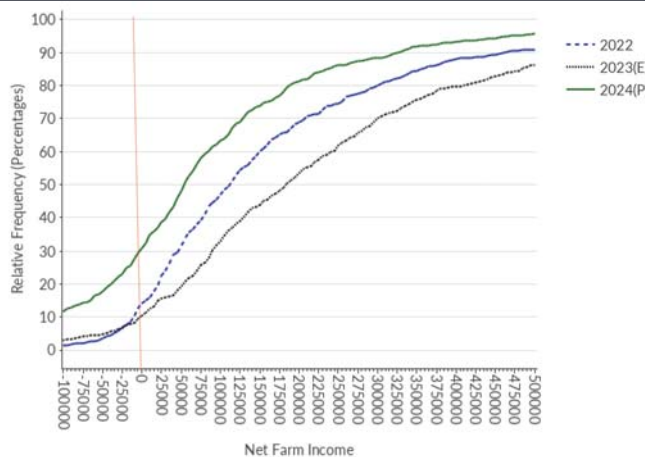
- We may have reached the AA price floor
  - Prices have declined by 50% since the peak
  - Current oil, corn, and inflation indicate a higher AA price
- Still a lot of upside price risk
  - Russia/Ukraine war is still a big unknown
  - Will a recession occur?
  - Inflation?
  - World oil price?



## Fertilizer prices are highly correlated

- Anhydrous prices are strongly correlated to other fertilizer prices
- Ammonia is starting point with other nitrogen products
- Potash has a 0.79 correlation
  - that's why potash prices are low
- Potash (K) is the big question mark
  - US depends almost entirely on imports
  - Production 480 K MT
  - Imports 7,000 K MT
  - Exports 100 K MT
  - Consumption 7,400 K MT
- Most imports (75%) come from Canada

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## Some bounce back in NFI this year

- Crop insurance will help mitigate revenue
- Strong beef prices
- Lower expenses (fuel and fertilizer) will help expenses
  - Some of these lower expenses may not show up until 2024 though
- Lower expected grain prices will impact 2024
  - Much uncertainty though looking past 2023

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# Questions?

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