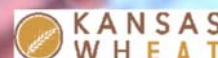


Update on Fertilizer and Oil

Gregg Ibendahl

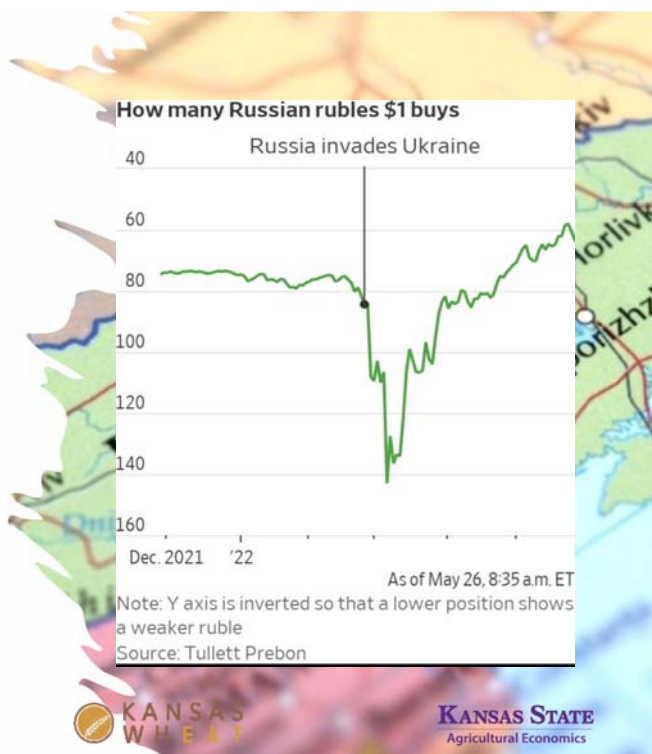
ibendahl@ksu.edu

@ibendahl



Are Sanctions Working?

- Ruble is the strongest it's been in over 5 years
 - High interest rates – but down to 9.5%
 - Natural gas and other commodities sold in rubles
- Russian economy expected to contract but less than initially predicted
 - 10% to maybe half that
- Strong ruble will likely help Russia export more.
 - Oil, gas, fertilizers are all fungible commodities – difficult to sanction



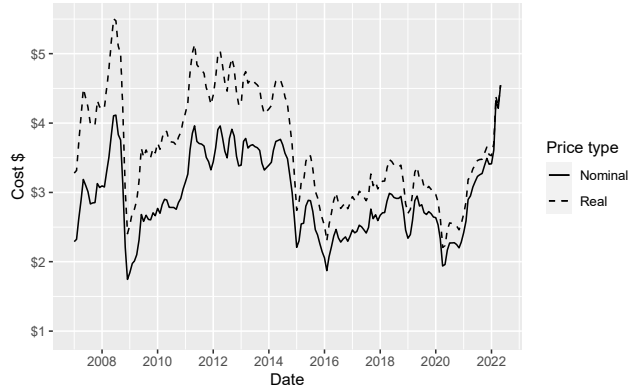
Fuel Prices



Highway Diesel Price



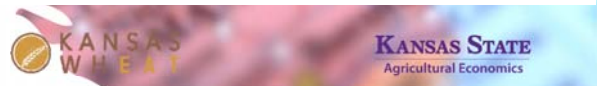
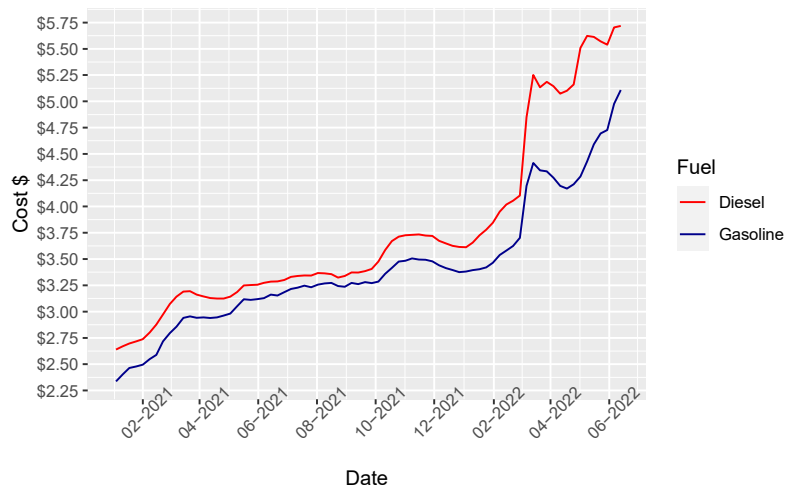
Highway Gasoline Price



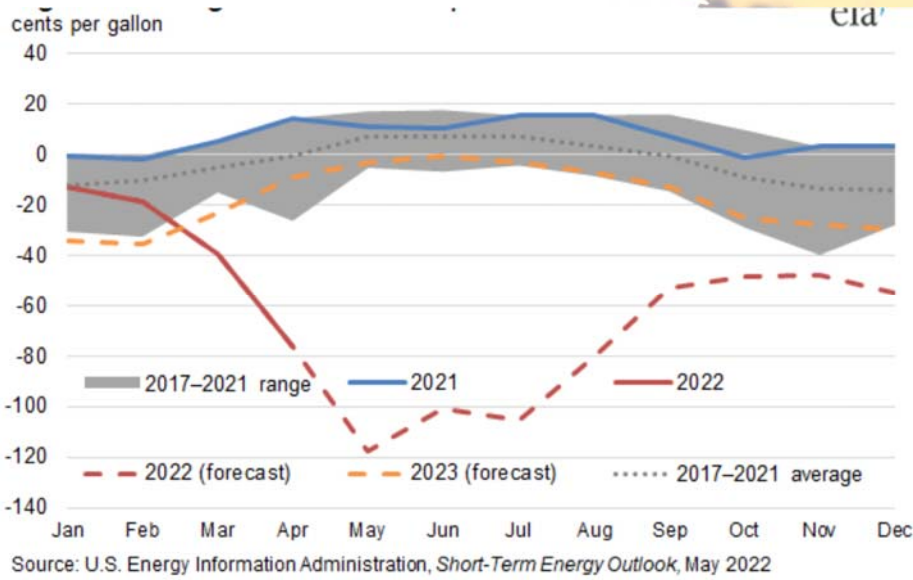
What has happened to the price spread?

- The price spread between diesel and gas has been consistent until this year.
- In May, this gap widened to \$1/gallon
- Gap is smaller but not from diesel prices declining

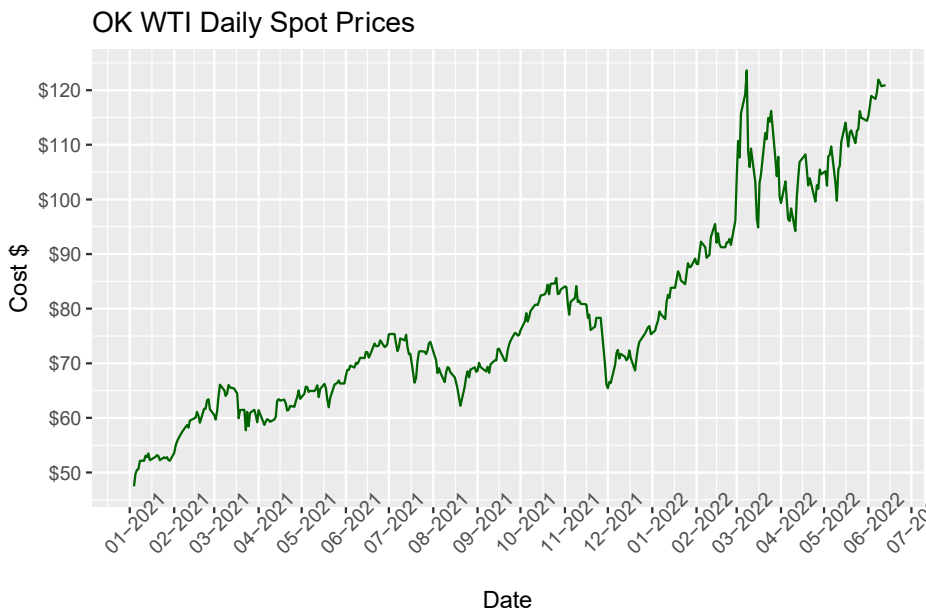
Highway Fuel Prices



EIA Graph of U.S. Gas-Diesel Price Differential

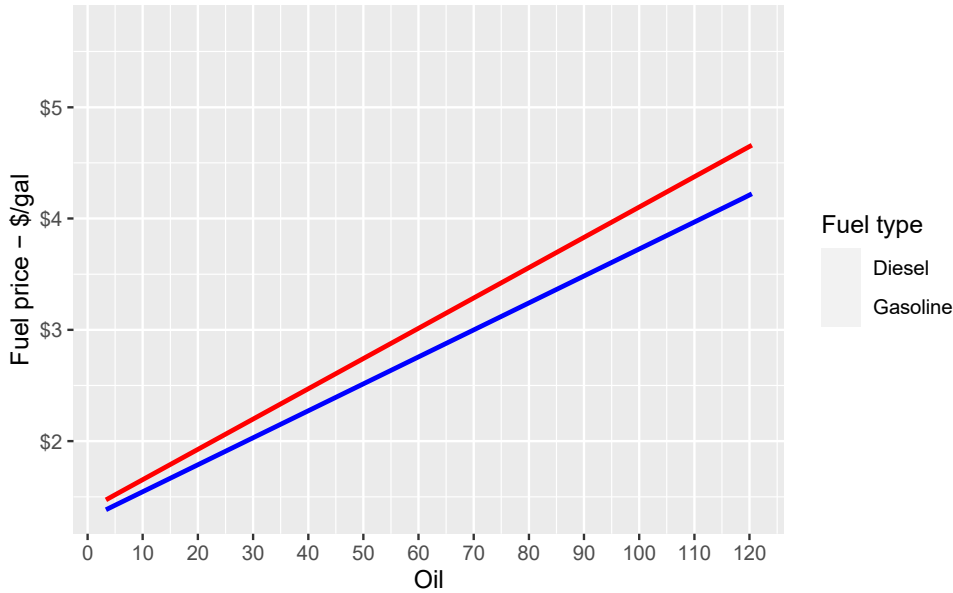


Oil prices now at same point when conflict started



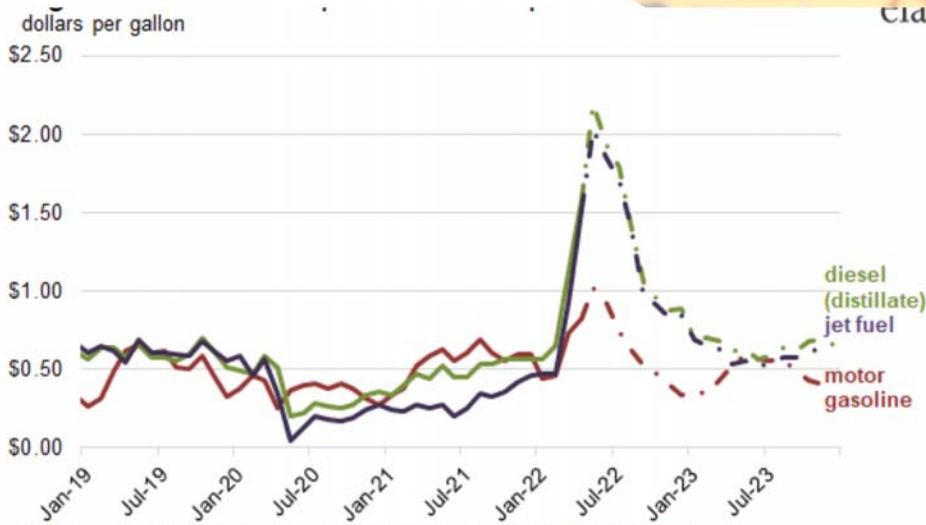
Where should fuel prices be?

Regression of Fuel vs Oil



KANSAS STATE
Agricultural Economics

U.S. Refined Product Crack Spreads

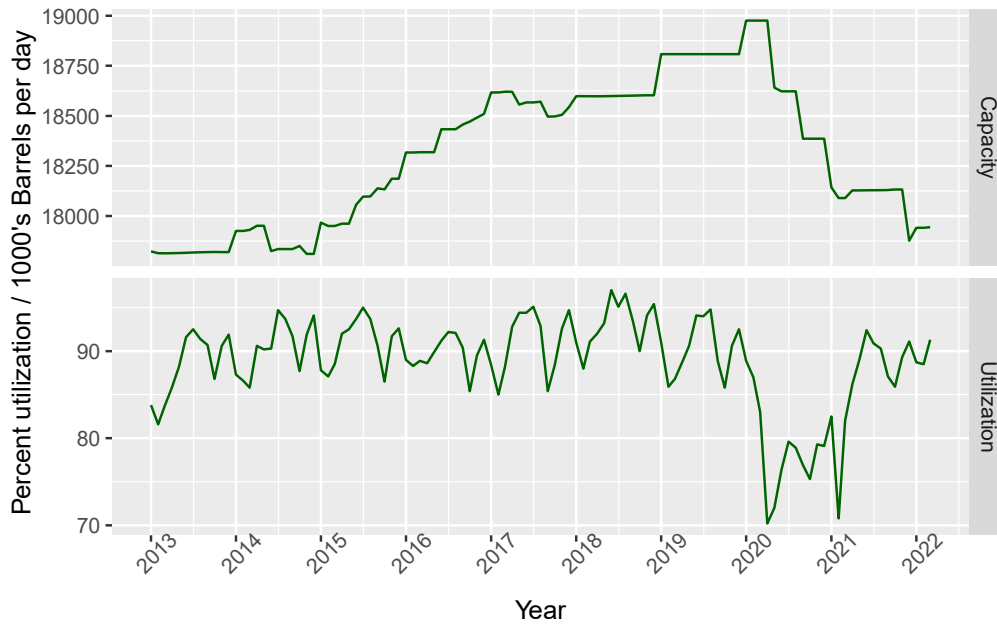


Source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, May 2022
 Note: We calculate crack spreads by using the average refiner price for resale minus the spot price of West Texas Intermediate crude oil at Cushing



KANSAS STATE
Agricultural Economics

Refinery Capacity and Utilization

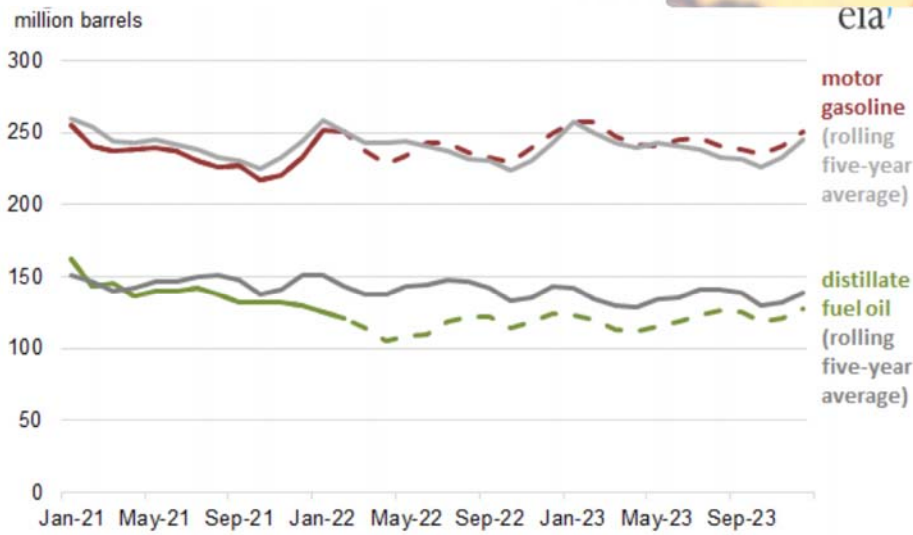


Why don't we have more refinery capacity

- Fire at Philadelphia refinery 3 years ago – permanently closed
- Closure of Alliance Louisiana refinery following damage from hurricane Ida
 - 256K bpd
- Closure of Houston refinery by 2024
 - 268K bpd
- Last refinery built in the U.S. was in the 1970s – nearly 50 years ago
 - Chevron CEO says there may never be a new refinery built in the U.S.
- Future of oil in the U.S.?
- Red tape to navigate if a new refinery was to be built



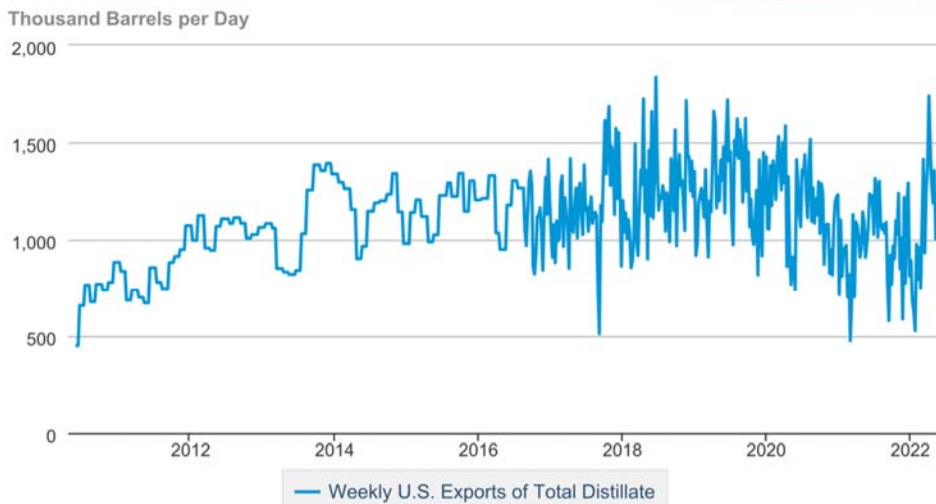
Gasoline and Diesel Inventories



Source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, May 2022



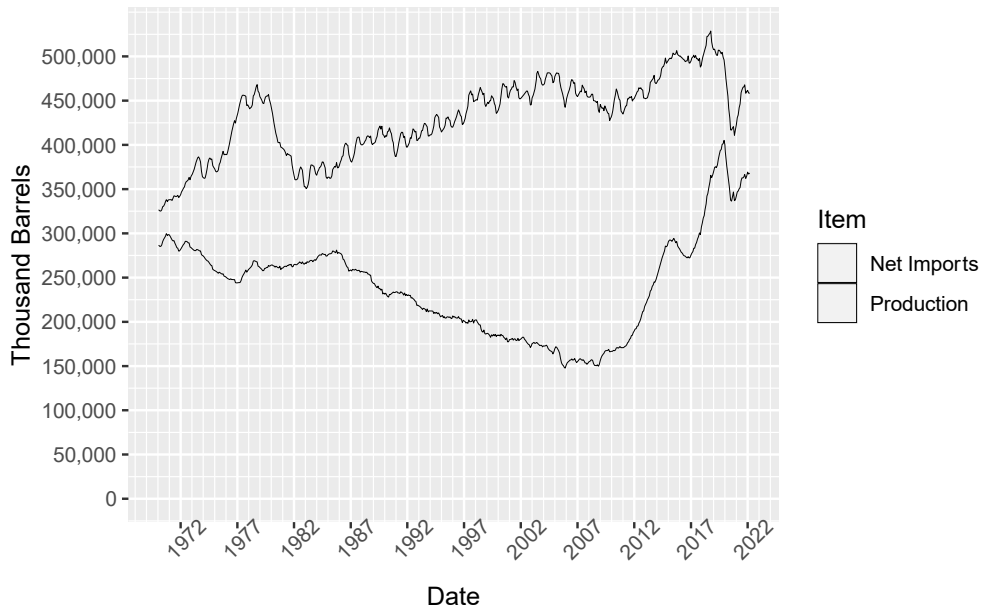
Weekly Exports of Diesel



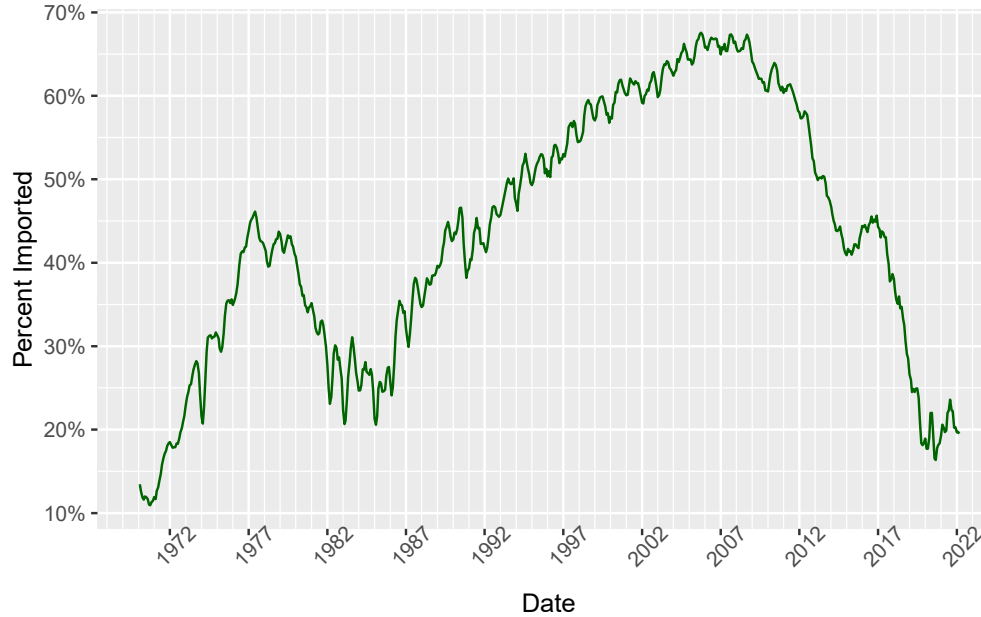
Source: U.S. Energy Information Administration



U.S. Oil Use by Production and Net Imports



Percent of U.S. Oil – Imported



Fertilizer Update

- February model

$$\begin{aligned} \text{Anhydrous ammonia (\$/ton)} = & \\ & - 104 \\ & + 36.7 * \text{corn (\$/bu)} \\ & + 2.14 * \text{oil_6 mo lag (\$/ barrel)} \\ & + 140 * \text{inflation expectations} \end{aligned}$$

- R-squared = 0.65



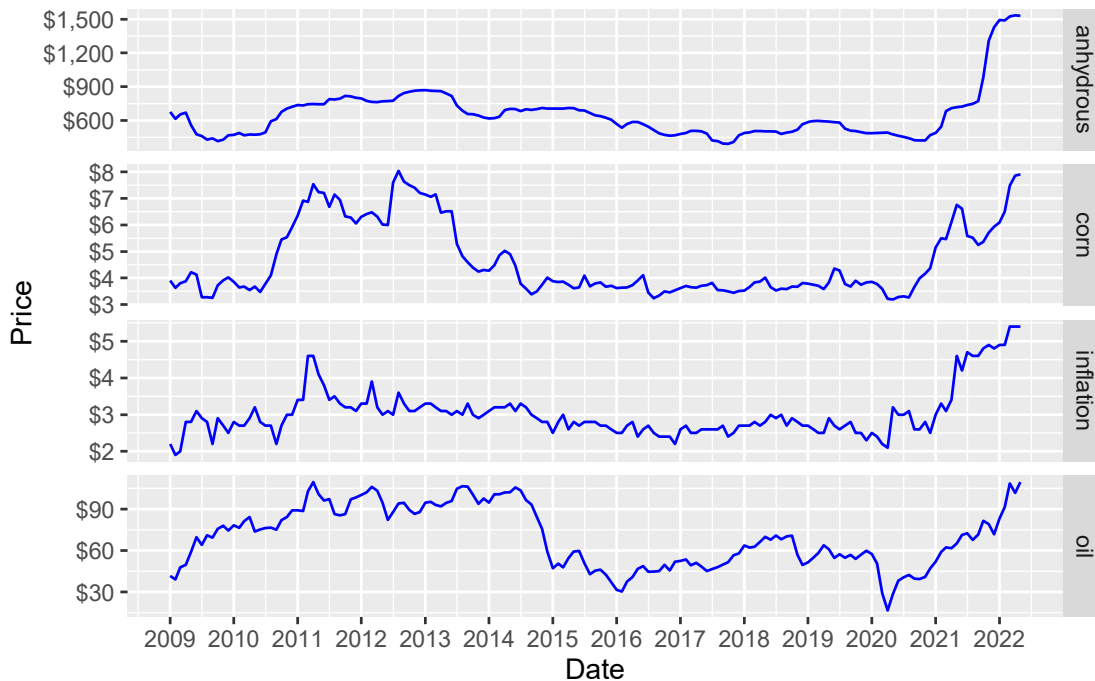
- June model

$$\begin{aligned} \text{Anhydrous ammonia (\$/ton)} = & \\ & - 165 \\ & + 33.5 * \text{corn (\$/bu)} \\ & + 2.38 * \text{oil_6 mo lag (\$/ barrel)} \\ & + 159 * \text{inflation expectations_2 mo lead} \end{aligned}$$

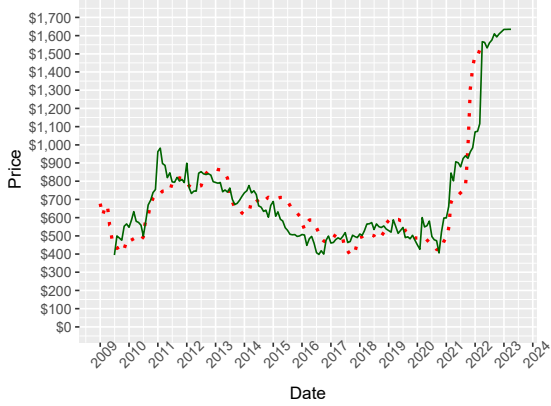
- R-squared = 0.75



Historical Anhydrous, Corn, Inflation, and Oil Prices



Anhydrous Price – Actual vs Predicted



Anhydrous Price – Actual vs Predicted

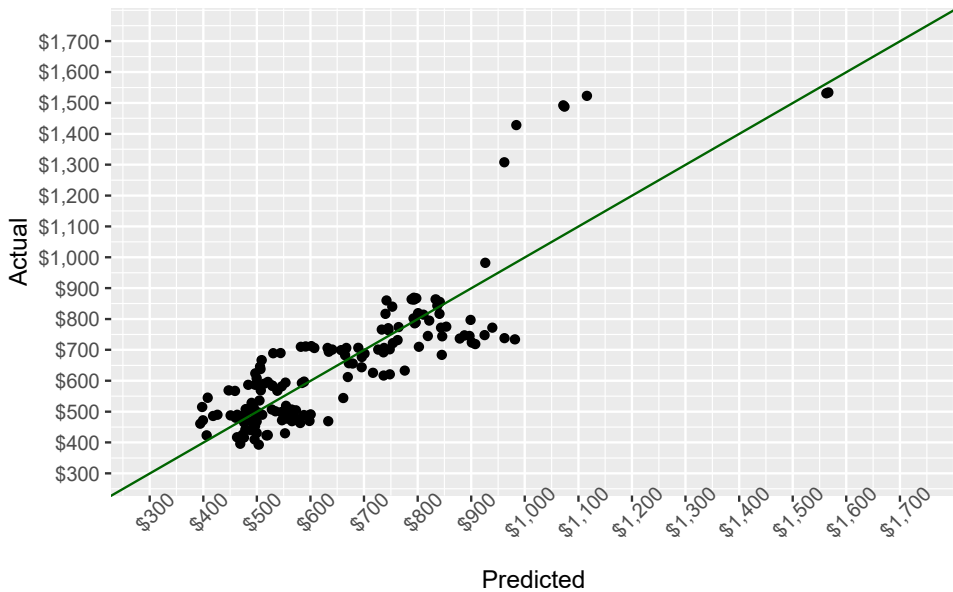


Prediction based on

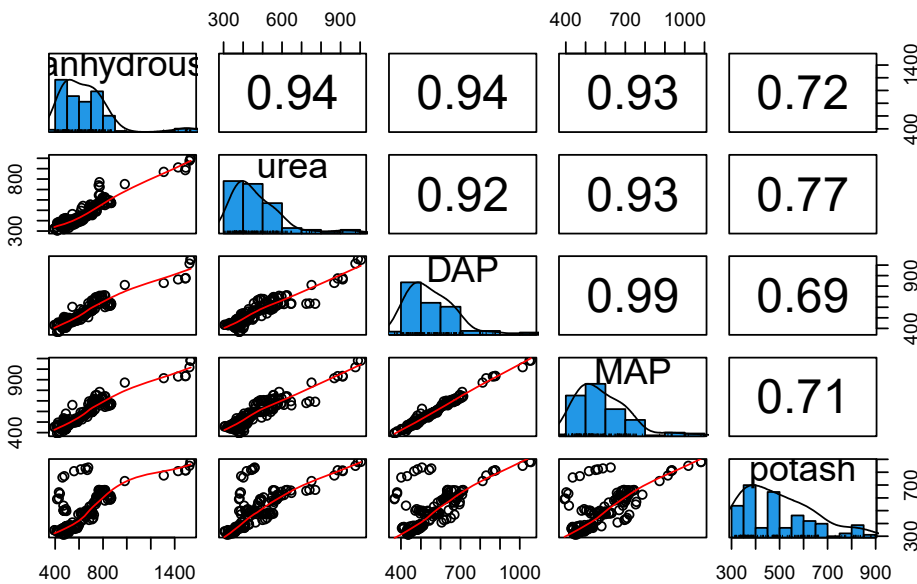
- 1) \$125 oil
- 2) Low \$7 corn
- 3) 8% inflation



Anhydrous Price Scatterplot of Actual vs Predicted



Fertilizer correlations



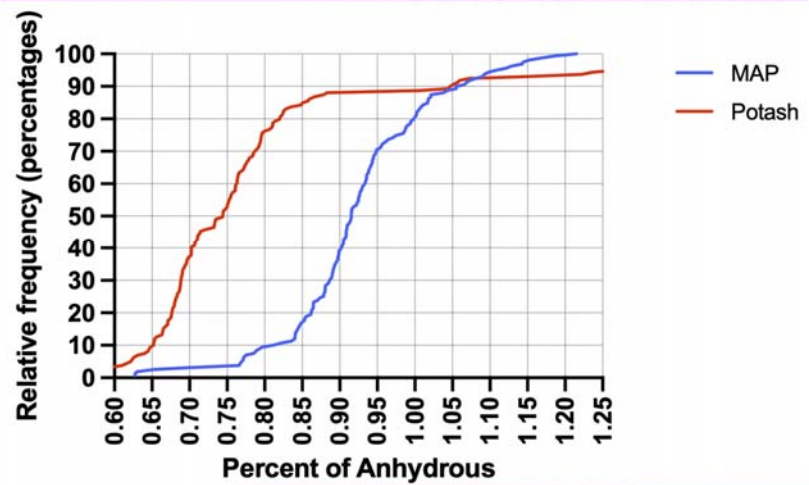
Effects of disruption to Russian supplied fertilizer

- U.S. is largely self-sufficient for:
 - Ammonia production (N)
 - Phosphate rock (P)
- No supply issue for N and P anticipated
 - N prices likely reflect current situation
- Potash (K) is the big question
 - Both supply and price
 - Most from Canada so less direct influence from Russia
 - Greatest price increases
 - Potash may be underpriced relative to anhydrous even before this started



Pricing relationship of anhydrous to MAP and Potash

- Map – 92% of anhydrous price
- Potash – 75% of anhydrous price
 - Wider variation is reflected on lower correlation
- IF AA = \$1600
 - Potash -> \$1200
 - \$300 possible increase
 - MAP -> \$1470
 - \$400 possible increase



The cure for \$5 gas is \$5 gas

- High gas prices could very well lead to a major recession
- Oil and gas prices would likely drop as consumers reduce demand
- Commodity prices would also drop
 - A repeat of the 1980's farm crisis?
- Fertilizer prices would drop too.
- We are still in a period of consumers wanting to travel due to Covid pentup demand



Questions???

ibendahl@ksu.edu

@ibendahl

