

## USDA Expense Indexes Through 2021

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### Introduction

With the increase in inflation that occurred in 2021, producers are likely wondering how much farm inputs have increased over time. The National Agricultural Statistics Service (NASS) reports on the prices received and paid by farmers. NASS reports most of these on an index basis relative to some base year. These reported indexes make it easy to see how prices have changed over time. One advantage of using indexes is that the base year can be readjusted by some simple math. The purpose of this paper is to examine those common expense items paid by farmers to see how they have changed over time relative to several base years. In this paper, the years 2021, 2017, 2012 are used as base years. These years represent a starting point 1 year, 5 years, 10 years, and 20 years ago.

This study examines the broad expense categories of herbicides, fertilizer, fuel, labor, machinery, repairs, and seeds in one graph and a second graph has a breakdown of the specific fertilizer types that NASS tracks; mixed, nitrogen, and potash and phosphate. In addition, the CPI index is used as a reference. As defined by NASS, prices paid represent the average cost of inputs purchased by farmers. NASS uses a survey of 2,000 thousand producers and agribusinesses to obtain the reported prices. The responses are aggregated by regional and national levels using appropriate weights.

### Methods

The NASS data is reported monthly and the graphs use a 3-month moving average (previous month, current month, future month) to help provide some smoothing to the figures. In each figure, the reported index is readjusted to set each expense item to zero. From that point forward, the reported NASS index value is readjusted to show the percent increase from the base point.

Because these indexes are based on survey data, there is some lag in reported values compared to what farmers are seeing for prices. Normally this wouldn't be a concern. However, fertilizer prices have increased tremendously during the second half of 2021. As a result, the fertilizer increase shown here, while large, is still underrepresented. A forthcoming fertilizer analysis will have more up-to-date fertilizer prices included in it.

### Results

Figures 1 and 2 show the expense changes for 2021. Figure 1 has the major expense categories while Figure 2 has the fertilizer breakdown. The figures for indexes starting 5,

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10, and 20 years ago are laid out similarly. In all of these figures, the CPI index is shown as well. The CPI index is used to represent inflation so input categories that are above the CPI index line indicate that an input category has increased in price faster than inflation (starting from the initial baseline).

### Discussion

Figures 1 and 2 show how much expenses have increased over the last year. While labor and seeds have increased less than the inflation rate, all the other expense categories have increased faster than the inflation rate. Fertilizer has increased the most which should come as no surprise to anyone. Total fertilizers have increased by 55% while nitrogen has increased by 80%. Again, the reporting lag results in a value lower than current fertilizer prices. Four major categories of farm expenses increased by more than 10% in 2021: fertilizer, fuels, machinery, and repairs. Fertilizer and fuel prices are typically highly correlated to each other but after October, fertilizer continued upward while fuel declined slightly.

Figures 3 and 4 show the price increases from 5 years ago. With these two figures, the variability of some of the inputs become more apparent. Fuel, for example has increased by 20% from the baseline and then fallen by 20% from the baseline. Fertilizer, labor, machinery, and repairs have all increased faster than the inflation rate. Surprisingly, seed and herbicide costs decreased over this 5-year timeframe.

Figures 5 and 6 show the price increases from 10 years ago. With these two figures, some of the starting point biases start to become clear. Fertilizer and fuel have actually decreased in price relative to 10 years ago while herbicides are about the same as the base. Labor, machinery, and repairs have increased faster than inflation over this timeframe.

The final two figures (Figures 7 and 8) show the price increases from 20 years ago. For producers, the bad news is that all farm expense categories except herbicides have increased at the inflation rate or higher. From a 20 year perspective, fertilizers have increased the most. However, there have been periods when fertilizers have been even higher. In 2008, fertilizer prices were over 300% higher than the base. This fertilizer price increase correlated to a sharp rise in fuel prices. Fertilizer prices were also high in 2011-15.

Seeds have increased the second most over this 20 year time frame. That might be surprising based on the 5 year increases discussed earlier. However, seed prices increased greatly from 2008 to 2015 and then leveled off. Fuels have increased the third most and the fuel increase reflects the fertilizer price increase. Machinery shows a more steady increase but notice the sharper rise in 2021

## Conclusions

Cost control is one way for farmers to improve profitability. However, when most expense categories increase in price faster than the inflation rate, that makes controlling costs difficult. Still, practices like comparison shopping and purchasing when prices are lower can help. A recent AgManger publican by the author address some of the times when prices for fuel may be lower than normal during the year.

This publication also shows how starting point biases can cloud the changes in expenses. It is important to review not only recent price increases but the long-term increases as well. Fertilizer is on the mind of every grain producer since prices have doubled in 6 months. Even from a 20 year perspective, fertilizer has increased the most so farmers need to pay attention to this expense even in years when it is not increasing so quickly.

USDA Price Indexes Relative to 2021-01-01

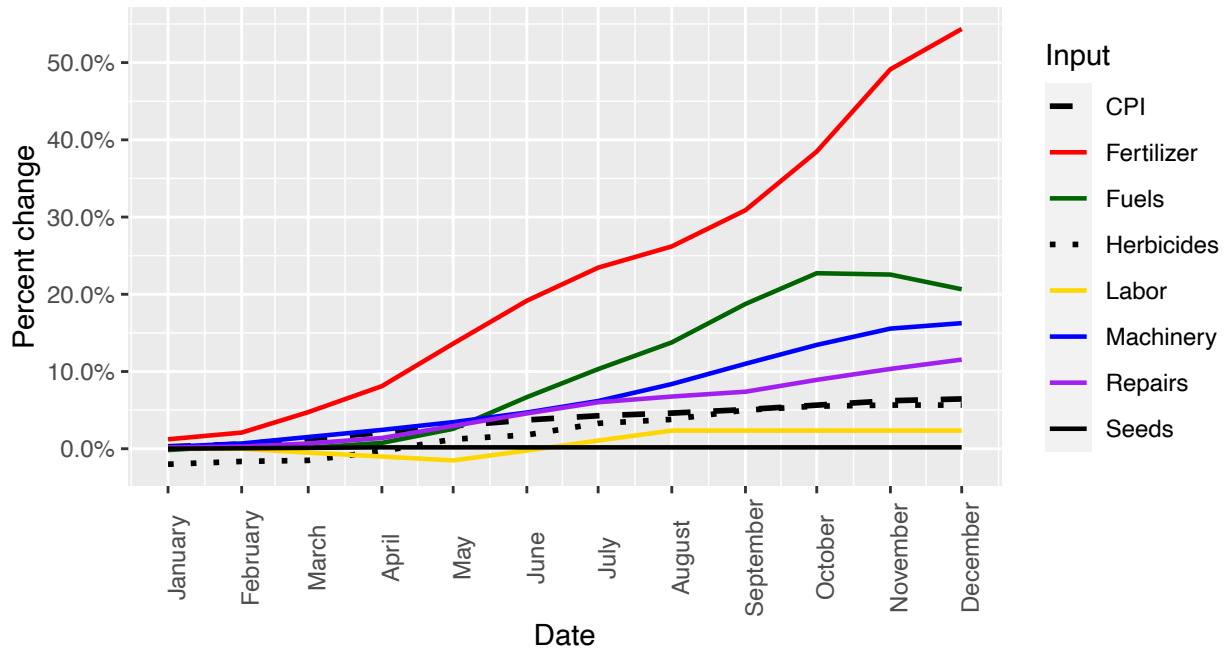


Figure 1. USDA Indexes, All Items, Relative to 1/1/21 - 1 Year

USDA Fertilizer Indexes Relative to 2021-01-01

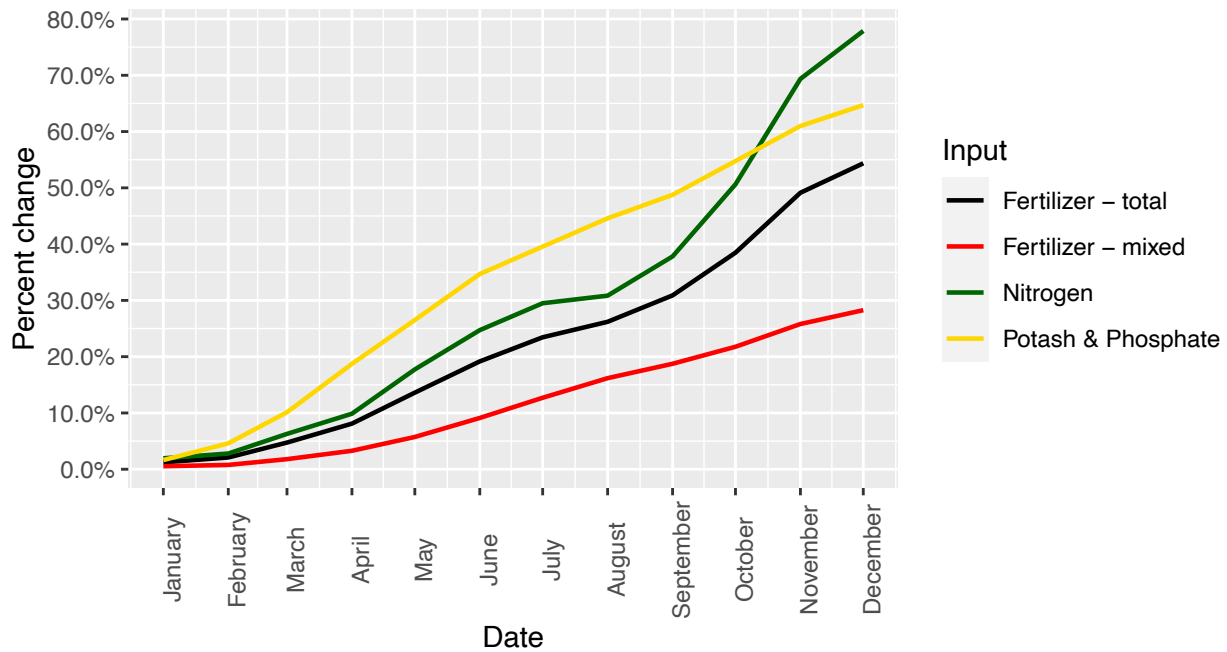


Figure 2. USDA Indexes, Fertilizers, Relative to 1/1/21 - 1 Year

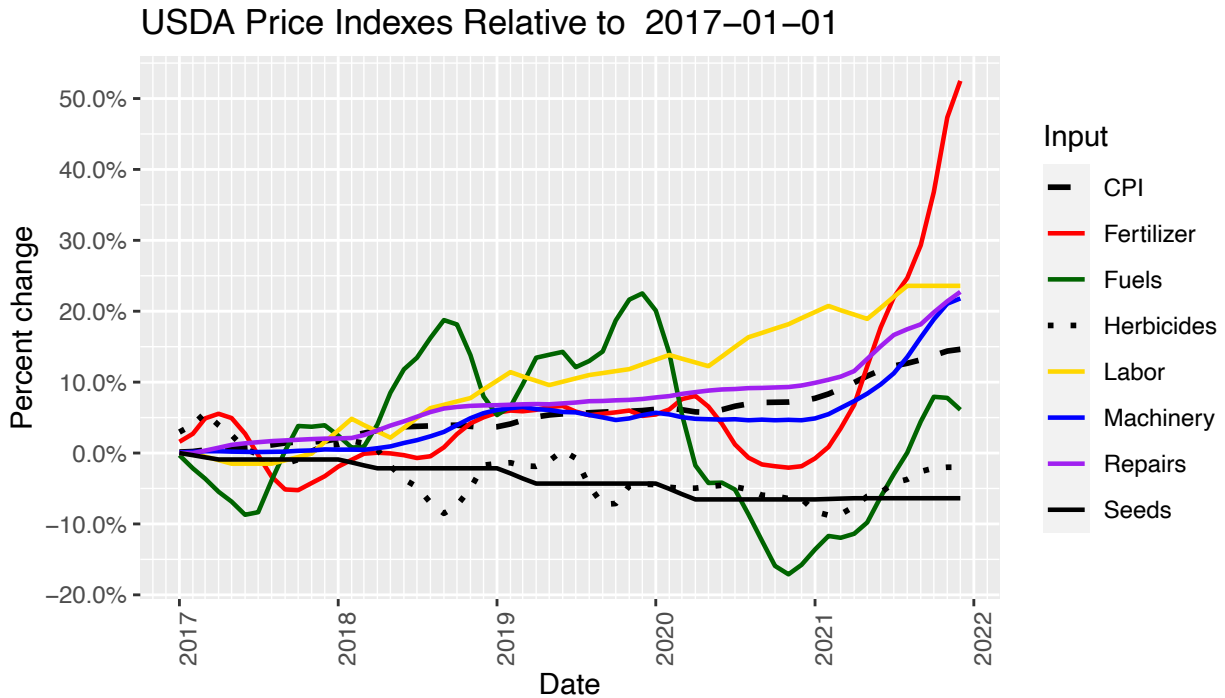


Figure 3. USDA Indexes, All Items, Relative to 1/1/17 - 5 Years

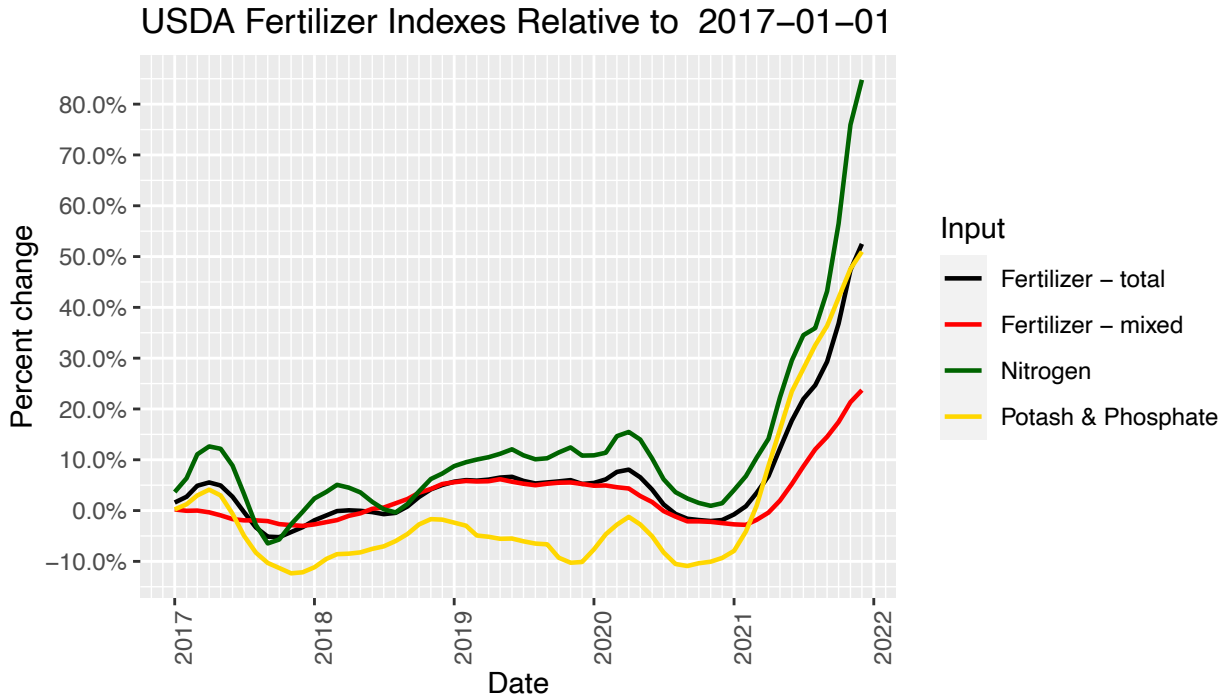


Figure 4. USDA Indexes, Fertilizers, Relative to 1/1/17 - 5 years

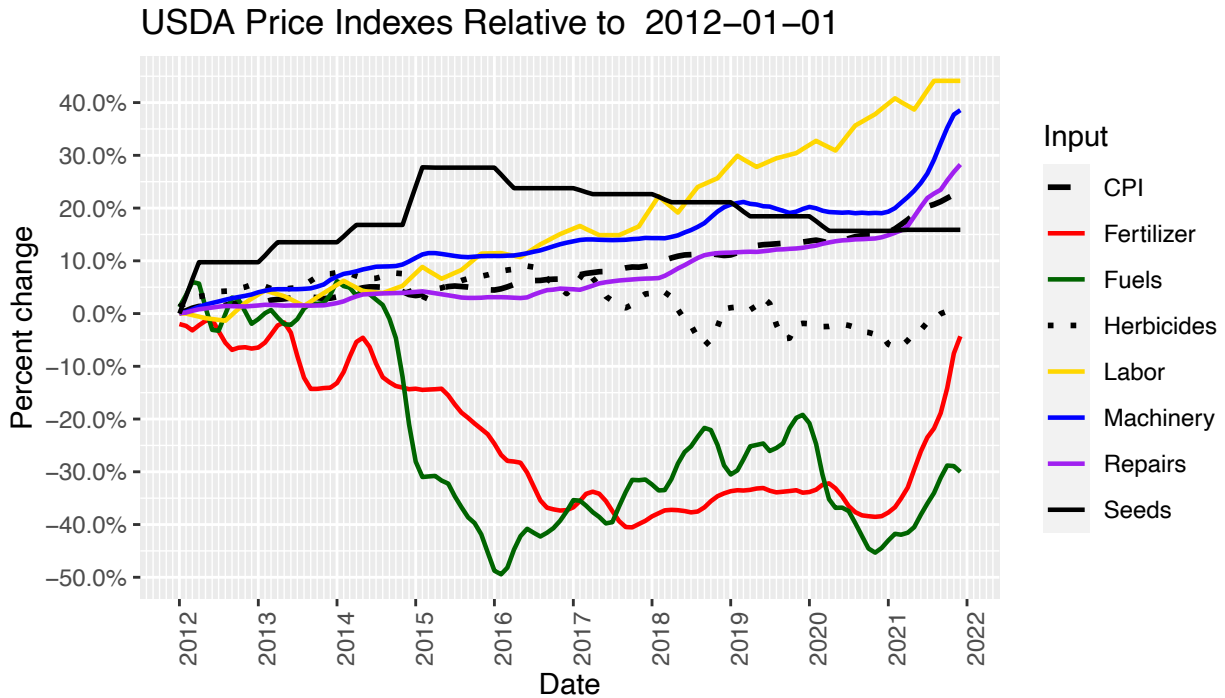


Figure 5. USDA Indexes, All Items, Relative to 1/1/12 - 10 Years

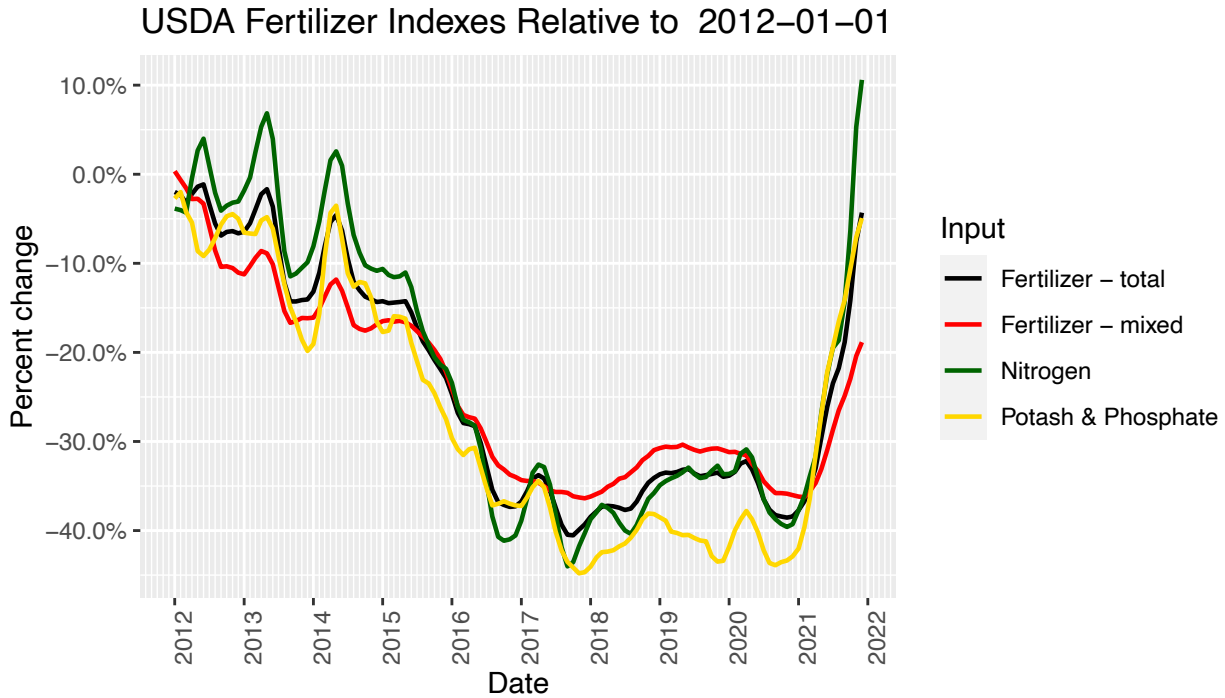


Figure 6. USDA Indexes, Fertilizers, Relative to 1/1/12 - 10 Years

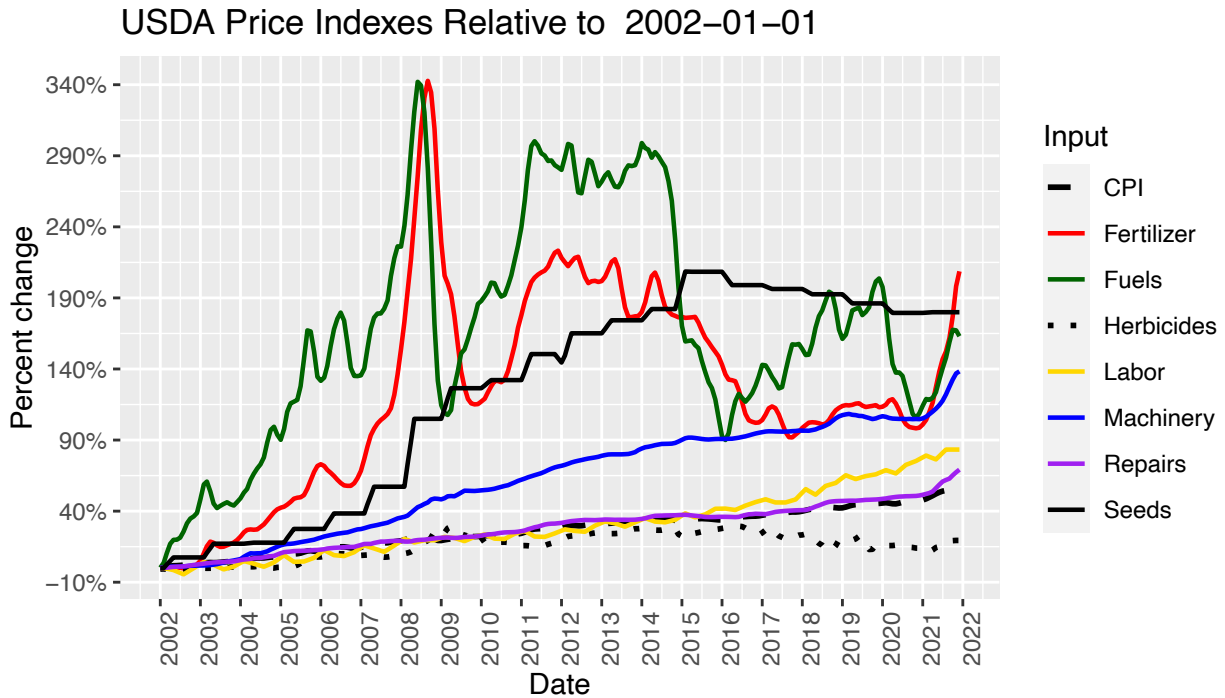


Figure 7. USDA Indexes, All Items, Relative to 1/1/02 - 20 Years

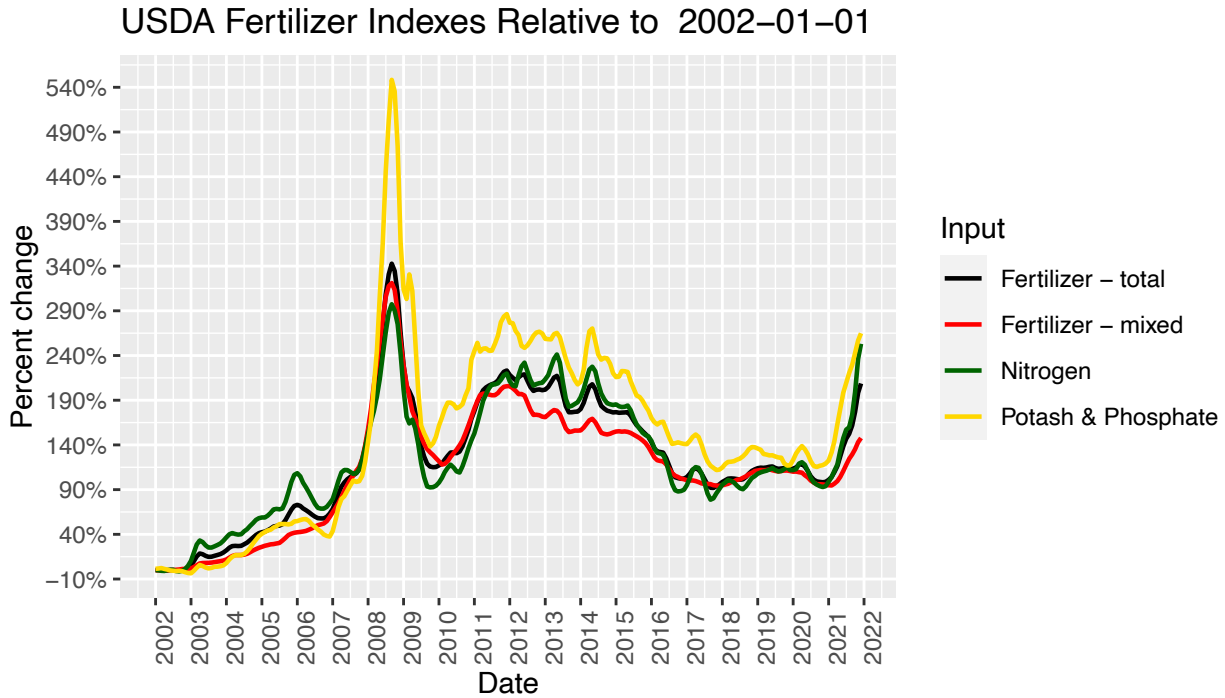


Figure 8. USDA Indexes, Fertilizers, Relative to 1/1/21 - 20 Years