Price Analysis: A Fundamental Approach to the Study of Commodity Prices

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Preface

Interested in more? Please let me know by taking the survey!

This is a book for beginners who want to study commodity price analysis from a fundamental perspective. These chapters are derived from my lecture notes teaching ACE 427: Commodity Price Analysis at the University of Illinois, and then AGEC 421 at Purdue University. The first outline of the book was based an outline given to me by Scott Irwin, who has taught ACE 427 at the University of Illinois for years.

This book is targeted at the upper level undergraduate student, or professional beginning a career related to commodity markets. The objective is to familiarize the reader with the sources of market information and research commonly used by practicing professionals working in the industry.

This book is updated with current information in the tables and figures each time I teach the course. Previous versions of the book can be found here.

For readers interested in more in-depth analysis of commodity prices using statistical software, I had been working on an R Companion to this book, but I have indefinitely paused development of this. If you are interested in the R code to create most of the tables and figures in this book from publicly available sources, you can study the script I use to update this book here.

To see some videos working through excel-based exercises I have developed for most chapters, see the youtube channel, here. Note that chapter order may have changed from the older videos to the order in the current form of the book.

About the Author

Mindy L. Mallory is an associate professor and Clearing Corporation Foundation Chair of Food and Agricultural Marketing in the Department of Agricultural Economics at Purdue University.

Dr. Mallory's research focuses on commodity markets and marketing issues, especially related to commodity futures and options markets. Topics of special interest include forecasting, liquidity costs, and price discovery.

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1 Grain and Oilseed Markets

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Highlights

- Biological processes of corn, soybeans, and wheat from planting, to growing, to harvesting, to storage
- How weather interacts with the biological processes to determine production
- Recent trends in production, exports, and prices.
- Varieties of wheat and determinants their differential prices.

Check your Understanding

- When are corn and soybeans planted?
- When are corn and soybeans harvested?
- When are the different varieties of wheat planted and harvested?
- What is the main driver of differential prices in wheat varieties?

Since commodities are natural things that are subject to biological processes, you must first understand the basic biological processes involved in the commodity's production in order to understand and anticipate what happens to it's price. This chapter introduces the basic production processes and timeline for major grains and oilseeds: Corn, Soybeans, Hard Red Winter Wheat (KC wheat), Hard Red Spring Wheat (Minneapolis wheat), and Soft Red Winter Wheat.

1.1 Corn

In the Corn Belt corn is planted from about March to May, and harvested from September to October. Pollination usually occurs in July. Since pollination is key to production and yield, new crop futures prices tend to be highly variable in the months of June and July as weather patterns and realizations of heat and rainfall mean the difference between a high yielding year and low yielding year.

Of lesser concern, but still followed by market participants is the weather during planting and harvest. Sometimes it is too wet, making it difficult to get acreage planted in a timely manner. If corn is planted too late it may suffer a yield penalty. Also, weather during harvest can

impact prices. If harvest time is very wet, it can make it difficult to get the crop out and dry before it is damaged.

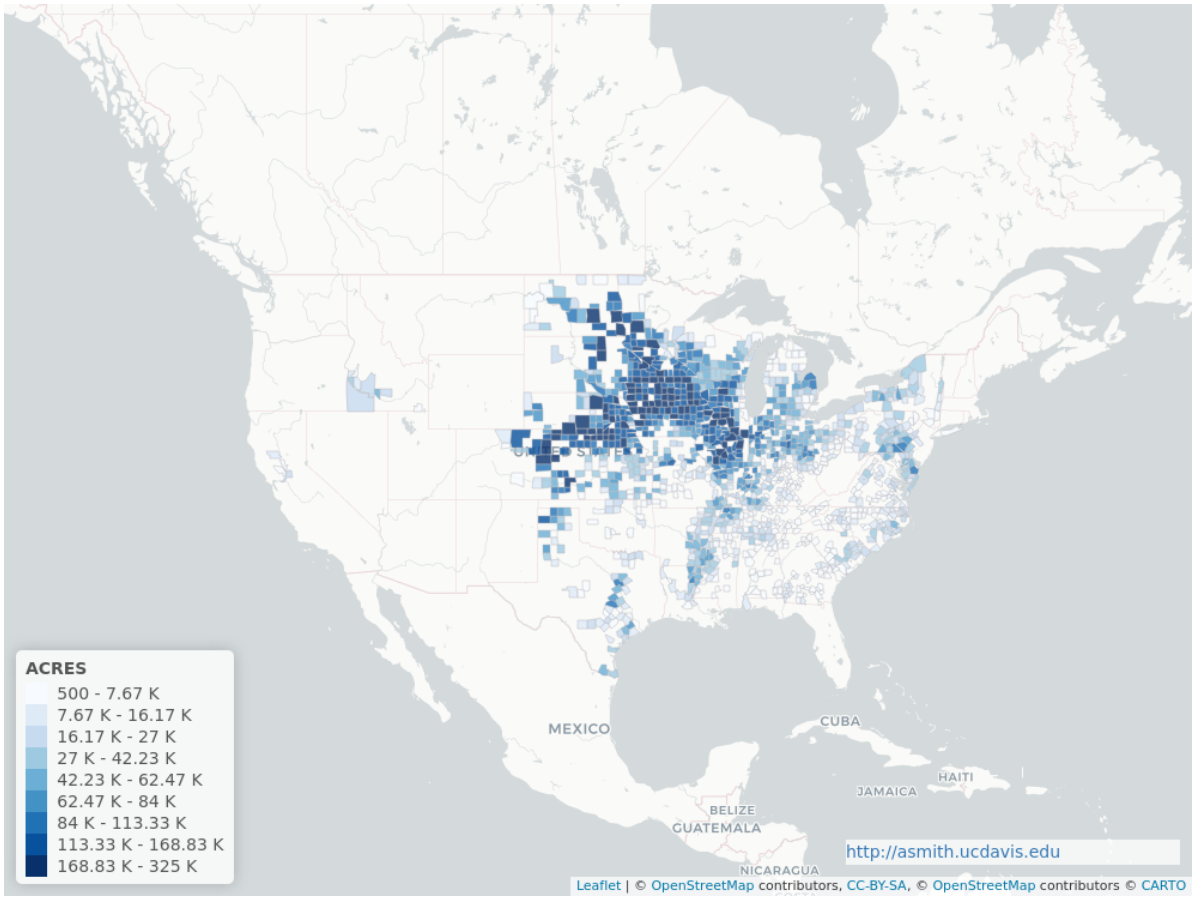

Figure 1.1: Corn Acres Planted 2019, map from Aaron Smith's Ag Data

1.1.1 Recent Trends in Acreage, Yields, Production, and Use

Corn planted acres in the U.S. has varied from just under to just over 90 million acres in recent years. Farmers in the corn belt decide how much of their land to plant to corn and how much to plant to soybeans. So sometimes it is said in the spring that corn and soybeans are 'competing for acres' based on the relative new crop futures prices of corn and soybeans. If corn is more profitable, farmers will shift some acres toward corn, and if soybeans are more profitable farmers will shift some acres toward soybeans. Because of this, years with high corn planted acres tend to have lower soybeans planted acres and vice versa.

Seed hybrids and genetic modification have lead to dramatic increases in yield over the last 100 years. Although, corn planted acres have been relatively flat for a very long time, production

has skyrocketed.

The following figures come from the USDA's National Agricultural Statistics Service (NASS).

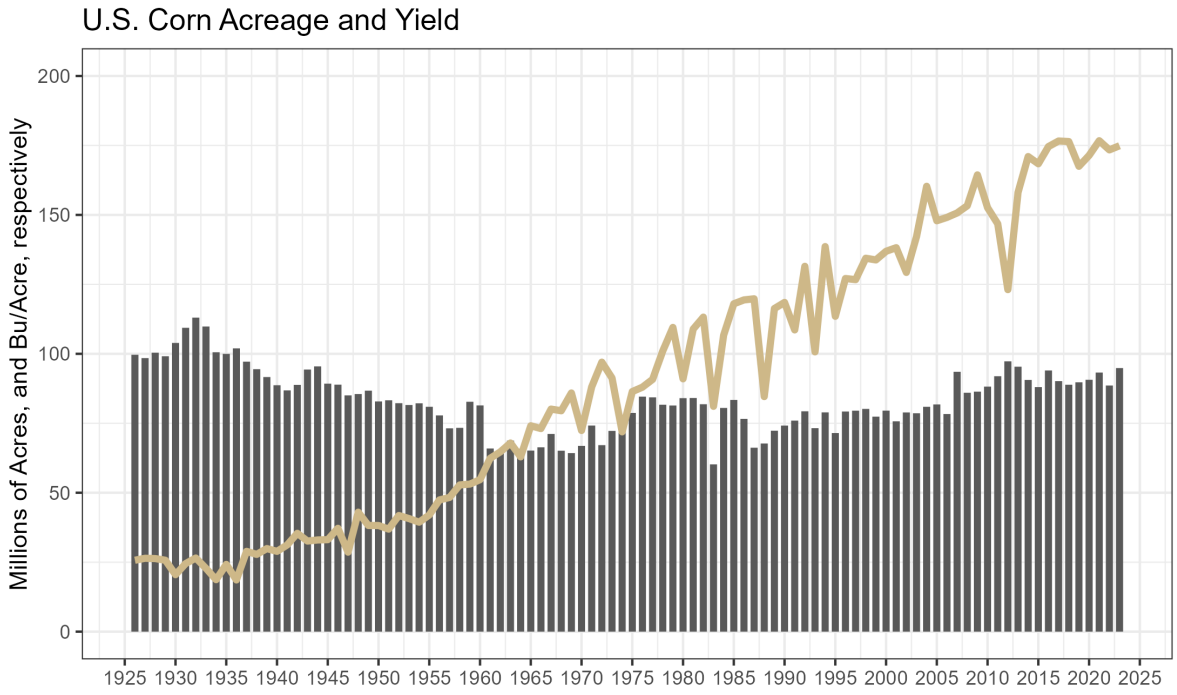

Figure 1.2: Data from USDA NASS

Corn prices can be quite volatile, with prices and production highly inversely related to one another.

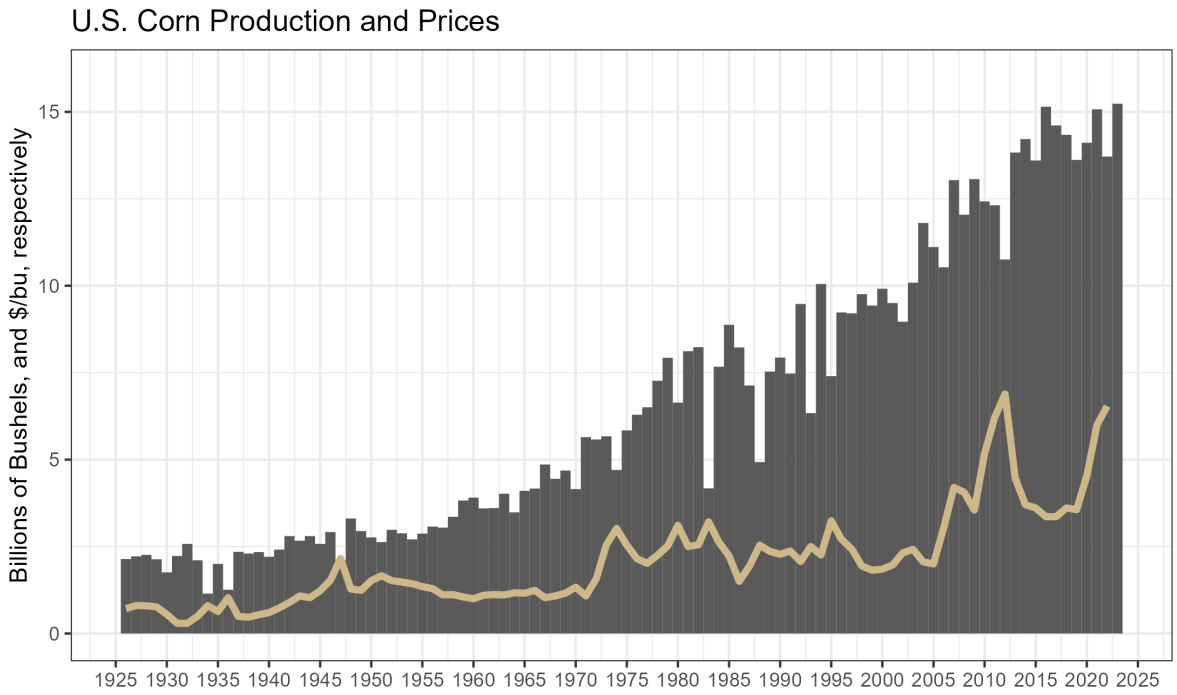

Figure 1.3: Data from USDA NASS

Corn is used in the U.S for a variety of purposes. Largest use categories are feed (for livestock), and alcohol for fuel use (ethanol blended with gasoline).

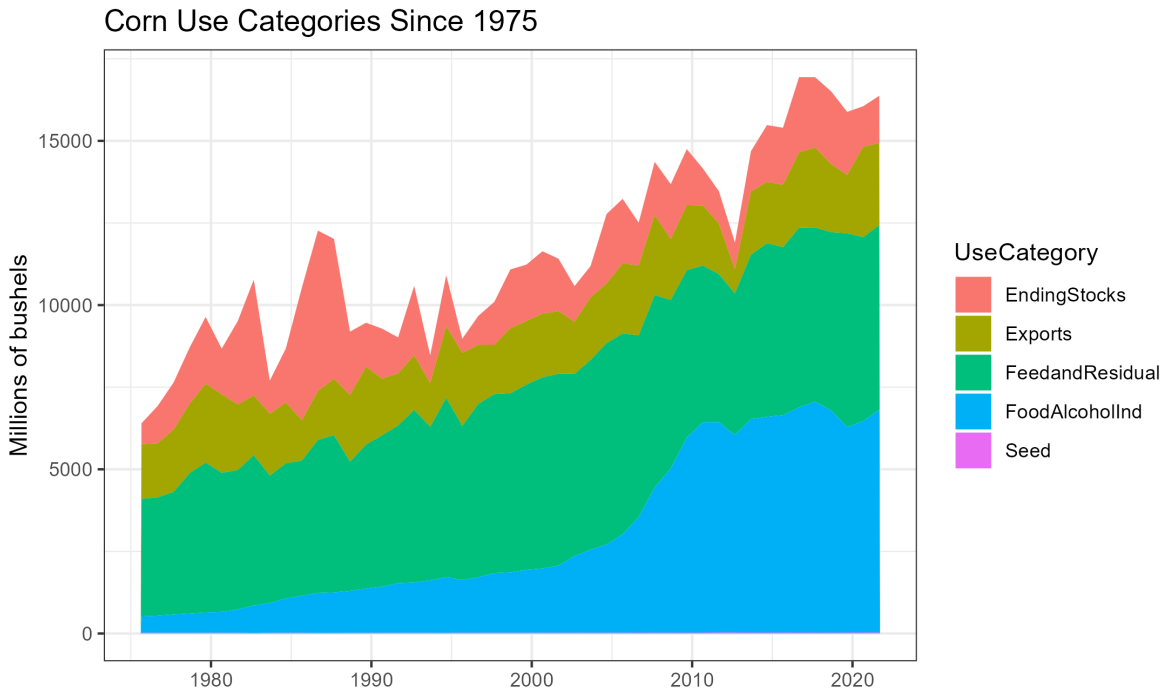

Figure 1.4: Data from USDA ERS

1.2 Soybeans

Soybeans are planted later than corn, from about April to June. Weather affects soybean production prospects and generates similar price responses as it does for corn. Soybean prices, therefore are highly dependent on what happens during the summer months.

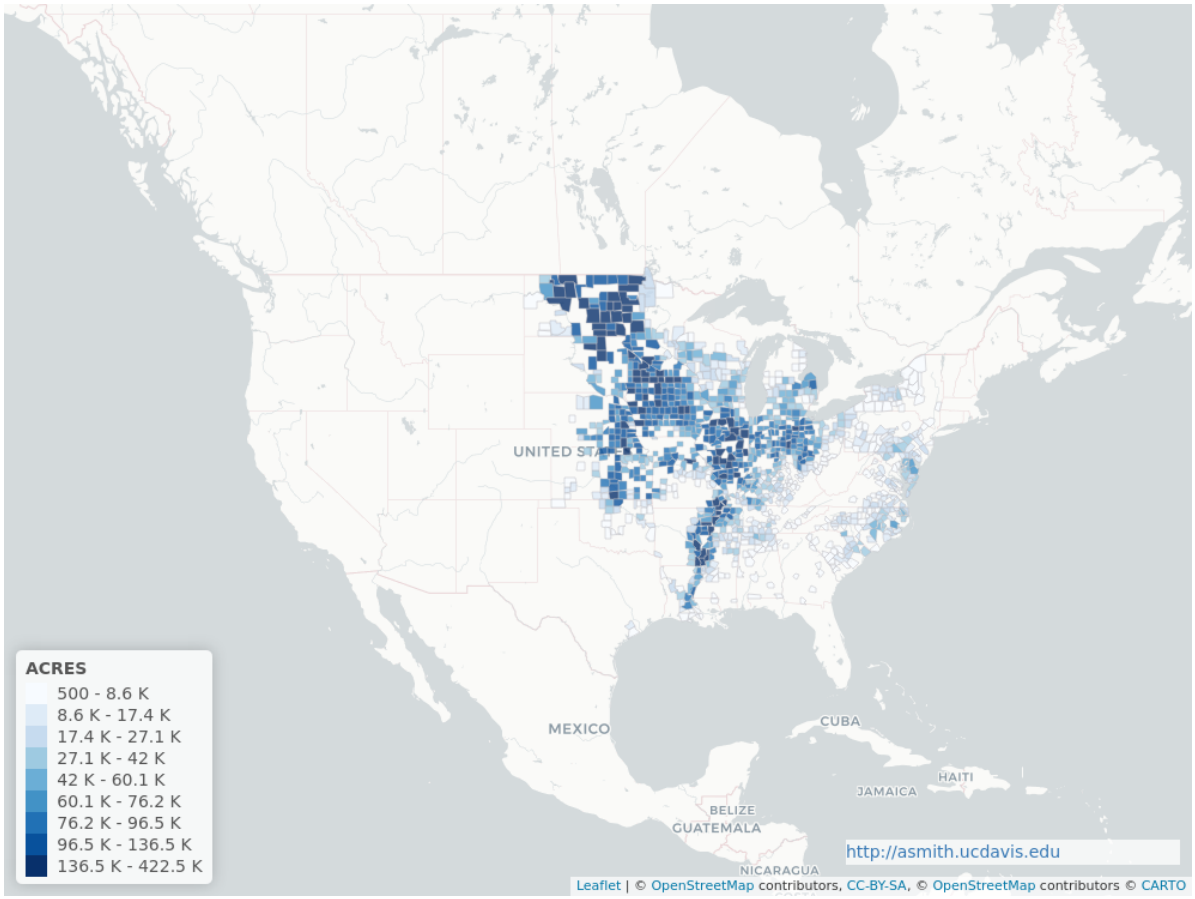

Figure 1.5: Soybean Acres Planted 2019, map from Aaron Smith's Ag Data

1.2.1 Recent Trends in Acreage, Yield, Production, and Use

Soybeans did not begin to be commercially grown in the U.S. until the

1.3 Recent Trends in Acreage, Yield, Production, and Use

Soybeans were not commonly planted in the U.S. until the mid 20th century, but once it was introduced, acreage expanded rapidly. Soybeans have also benefited from improved yields due to biotechnology.

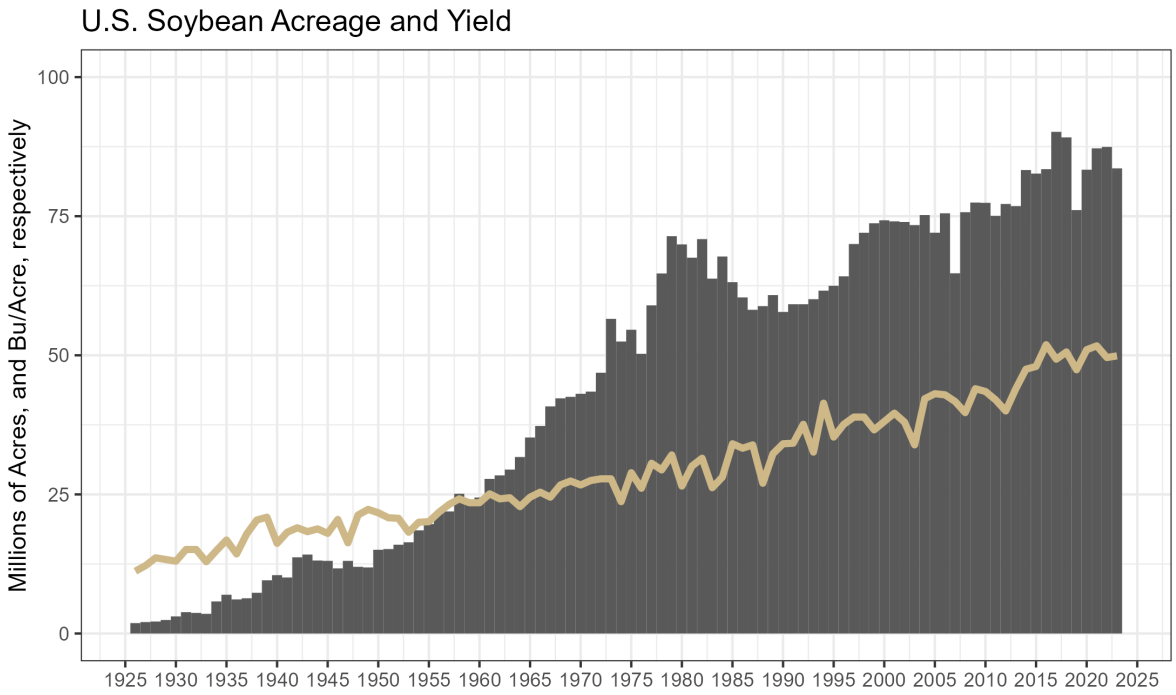

Figure 1.6: Soybean Acres and Yield

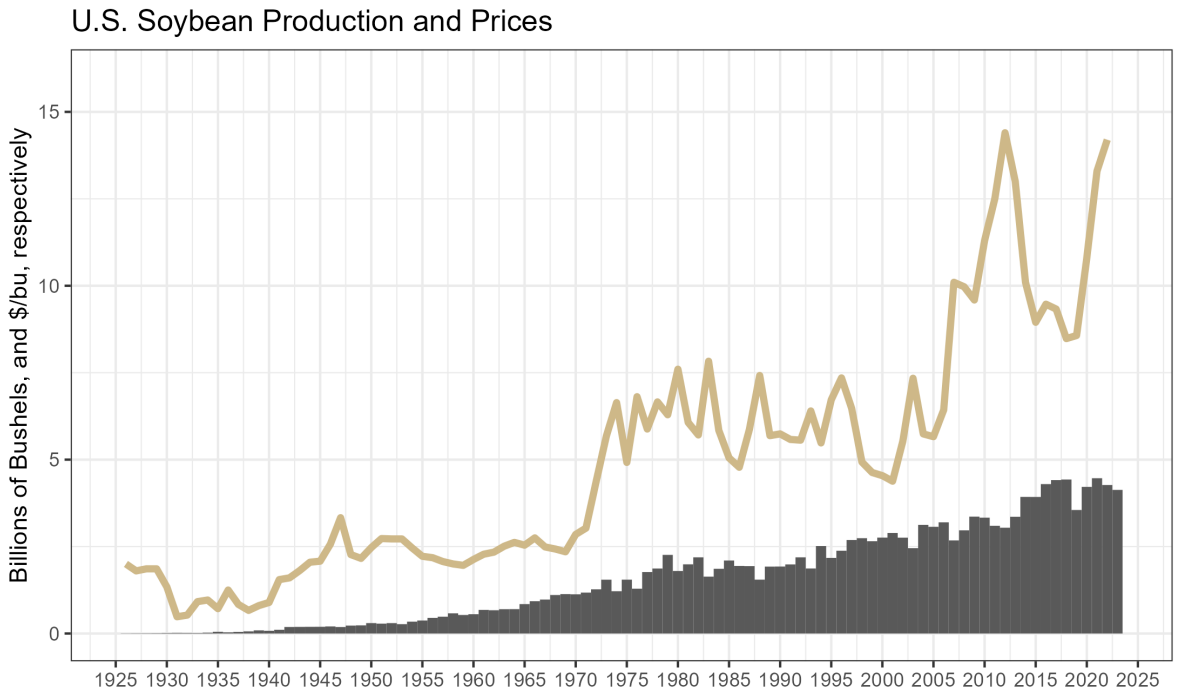

Figure 1.7: Soybean Production and Prices, Data from USDA NASS

Soybeans consumed in the U.S. are almost exclusively processed into soybean meal and soybean oil, a process referred to as 'crushing'. Soybean meal is high in protein and used as an ingredient in livestock feed. Soybean oil is used for a variety of things, but the bulk of it is consumed as edible oil.

About half of the soybeans produced in the U.S. are exported, and more than half of soybeans exported are imported by China.