



**THE EXPANSION OF CORN AND WHEAT PRODUCTION IN BRAZIL AND
THEIR POTENTIAL FOR ENERGY USE AND ANIMAL NUTRITION
A EXPANSÃO DA PRODUÇÃO DE MILHO E TRIGO NO BRASIL E O SEU
POTENCIAL PARA USO ENERGÉTICO E NUTRIÇÃO ANIMAL**

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Abstract

This work considered the following problems: how did the increase in area and production of corn and wheat occur in Brazil? What are the trends for increasing the production of these crops in the coming years and what will be the role of ethanol production in keeping the demand for these cereals high and at attractive prices for farmers? Corn and wheat production and area data were collected from the The National Supply Company; and corn processed data for ethanol were collected from the National Petroleum Agency. We observed that, from 2017 to 2022, there was an increase of more than 700% in corn processing for ethanol production. It is a trend, especially in the Brazilian Midwest, with hybrid plants, which process sugarcane and corn in the same plant. Wheat tends to follow a path similar to that of corn when used for ethanol production, with the increase in processing plants and the entry of companies and cooperatives for this purpose.

Keywords: bioenergy; ethanol, food production.

Resumo

Este trabalho considerou os seguintes problemas: como ocorreu o aumento da área e da produção de milho e de trigo no Brasil? Quais são as tendências para o aumento da produção dessas culturas nos próximos anos e qual será o papel da produção de etanol para manter a demanda por esses cereais elevada e com preços atrativos para os agricultores? Os dados da produção e da área de milho e trigo foram coletados da Companhia Nacional de Abastecimento; e os dados de milho processado para etanol foram coletados da Agência Nacional do Petróleo, Gás Natural e Biocombustíveis. Observamos que, de 2017 a 2022, houve um aumento de mais de 700% no processamento de milho para produção de etanol. É uma tendência, principalmente na região Centro-Oeste do Brasil, com usinas híbridas, que processam cana-de-açúcar e milho na mesma planta. O trigo tende a seguir um caminho semelhante ao do milho quando utilizado para a produção de etanol, com o aumento de usinas processadoras e a entrada de empresas e cooperativas para tal finalidade.

Palavras-chave: bioenergia; etanol; produção de alimentos.

1. Introduction

Brazil is the largest global net exporter in agribusiness. In addition to current production, there are opportunities to significantly increase production due to the land availability, the

conversion of pastures into more intensive areas for agriculture and livestock, as well as the use of cultivated areas with second and third harvests.

Corn is one of the crops that has driven the growth of Brazilian agribusiness. Corn area in Brazil has grown in recent years (MAPA, 2022), especially in second and third harvest areas. The second harvest of Brazilian corn is more important than the first harvest sown during the year. The growth in corn production is due to attractive prices in the domestic and international markets. In addition to the increase in exports, there is a great demand for corn for animal nutrition and an expansion of ethanol processing industries in the Brazilian Midwest (BRANCO et al., 2021).

Another cereal expanding in area and production in Brazil is wheat. This cereal is grown especially in southern Brazil, in the second harvest. Since 1990, the cultivated area has been decreasing (MAPA, 2022), however, in recent years, an increase in production has been observed. The war between Russia and Ukraine increased the price of cereals, but there are initiatives for the production of ethanol and wheat that signal the behavior of the production chain with the possibility of a trajectory similar to that of corn.

Based on this context, this work raises the questions: how did the increase in area and production of corn and wheat occur in Brazil? What are the trends for increasing the production of these crops in the coming years and what will be the role of ethanol production in keeping the demand for these cereals high and at attractive prices for farmers?

The context of war demonstrated that global food supply chains are intertwined and supply constraints have a great impact on other countries. In addition, depending on the grain area in Brazil, trends and changes can impact prices, food availability and bioenergy in the world.

2. Methodology

Corn and wheat production and area data were collected from the The National Supply Company (CONAB, 2022), the main crop monitoring agency in Brazil. Corn processed data for ethanol were collected from the National Petroleum Agency (ANP, 2022). Data were tabulated and graphs were generated for analysis. In addition, secondary data and conversations with experts were consulted to gather data on expansion trends in the Brazilian area.

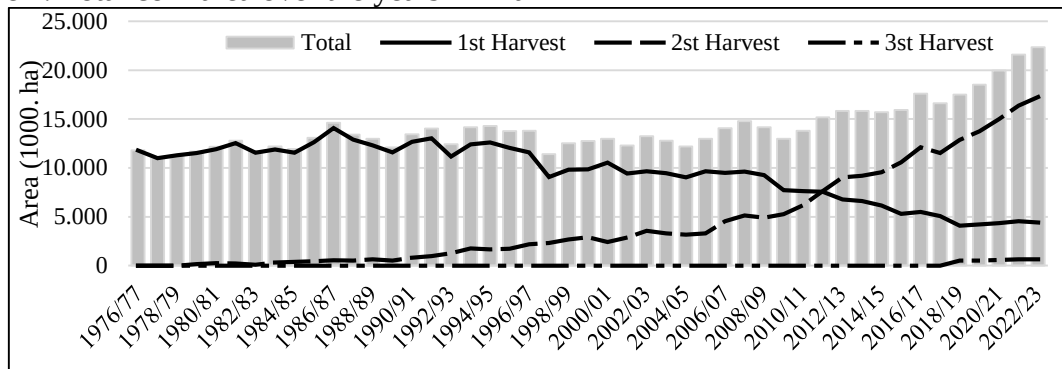
3. Results and discussion

The food production and destination for animal production and energy is a relevant issue, which is why it affects international prices. In addition, if the trend towards increased production of ethanol from corn, and, more recently, from wheat, materializes, shifts in animal production (beef cattle, swine and poultry) to new regions may occur, depending on the availability of feed for animals. These dynamics are of interest to companies and public policy makers because of their impacts.

The study interests companies in the sector, which can direct their investments to increase the share of their businesses in those regions where the expansion of these cereals is taking place. New cultivars will be in demand, new logistics infrastructure and a whole new supply chains will be needed.

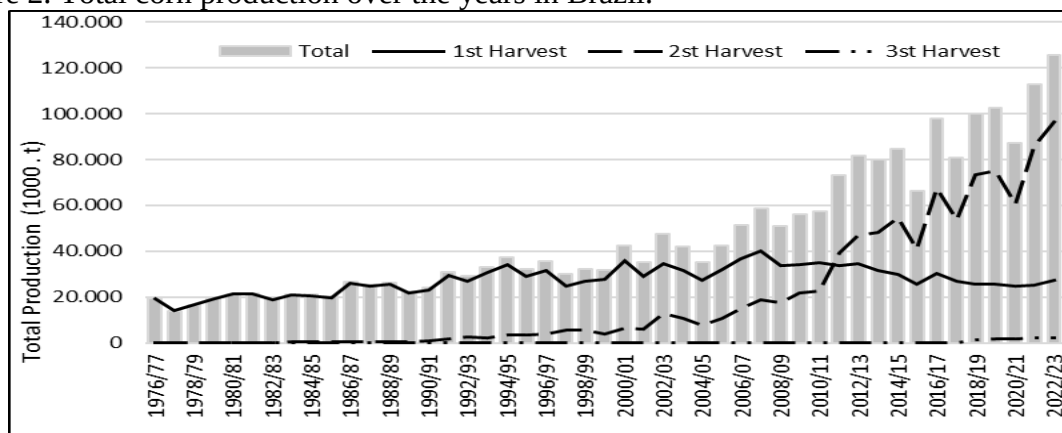
In Figure 1, the growth of the corn cultivated area in Brazil over the years can be seen. It is observed that the cultivated area with the first harvest reduced, while the cultivated area with the second harvest increased significantly during the years. The 2011/2012 harvest was the first year in which the first corn harvest was smaller than the second harvest, known as “safrinha” (in Portuguese).

Figure 1. Total corn area over the years in Brazil



Corn production has been increasing significantly in Brazil. In the 2021/2022 harvest, 125.82 million tons of corn were harvested (Figura 2). The second harvest contributed 96.3 million tons of corn. Some factors explain this growth in Brazilian corn production. The cereal price has remained at high levels, due to the high demand for the cereal for animal nutrition (especially swine and poultry) and the greater Brazilian export of corn.

Figure 2. Total corn production over the years in Brazil.

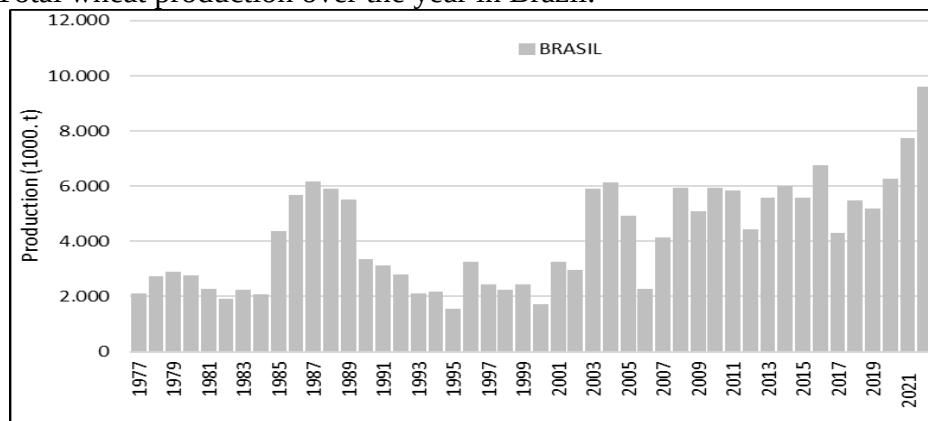


In addition to these factors that keep the demand for corn heated, there is an increase in corn processing units from ethanol in Brazil and, consequently, the volume of cereal processed. In 2022, around seven million tons of corn were processed for ethanol production in Brazil. In five years (2017-2022), there was an increase of more than 700% in the corn processing for this purpose. In April 2022, of the total 27.55 billion liters of ethanol produced in the Center-South region, 3.47 billion liters originated grain cultivation - an increase of 34.33% in relation to the 2020/2021 harvest (ANP, 2022). Currently, the world's largest producer of corn ethanol is the United States. In Brazil, this corresponds to 13% of the total produced, while, two years ago, its share was no more than 6%. By 2030, the sector forecast is to reach 20%, producing around 10 billion liters per harvest (MAPA, 2022).

The production of ethanol from corn has advantages compared to sugarcane. While a ton of sugarcane produces between 70 and 85 liters of ethanol, a ton of corn can produce between 370 and 460 liters, depending on the corn quality, which fluctuates little and is practically free of impurities (CRAGO et al., 2010). While corn can be stored for up to three years before being processed, sugarcane requires processing right after harvesting. A corn plant can also operate all year round, depending on its characteristics.

The production of corn from ethanol generates a by-product called DDG (Dried Distillers Grains). With the significant increase in its availability, the tendency is for its price to decrease and, as in the United States, this ingredient can be used as a source of protein and energy in formulations.

Figure 3. Total wheat production over the year in Brazil.



Unlike corn, wheat ethanol plants are still in the construction phase, with several projects being announced. The impact on demand for wheat should occur in the coming years. Wheat ethanol plants will sell dried grains (Figure 3), a by-product of ethanol production used as animal feed.

4. Conclusions

We observed that, from 2017 to 2022, there was an increase of more than 700% in corn processing for ethanol production. It is a trend, especially in the Midwest region, with hybrid plants, which process sugarcane and corn in the same plant. Wheat tends to follow a path similar to that of corn when used for ethanol production, with the increase in processing plants and the entry of new companies and cooperatives for this purpose.

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