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The Rise of South American Grain and Oilseed Use and Production since 1980

Carl Zulauf

Department of Agricultural, Environmental and Development Economics
Ohio State University

Joana Colussi, **Gary Schnitkey**, and **Nick Paulson**

Department of Agricultural and Consumer Economics
University of Illinois

November 29, 2023

***farmdoc daily* (13): 216**

Recommended citation format: Zulauf, C., J. Colussi, G. Schnitkey, and N. Paulson. "The Rise of South American Grain and Oilseed Use and Production since 1980." *farmdoc daily* (13): 216, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, November 29, 2023.

Permalink: https://farmdocdaily.illinois.edu/2023/11/the-rise-of-south-american-grain-and-oilseed-use-and-production-since-1980.html

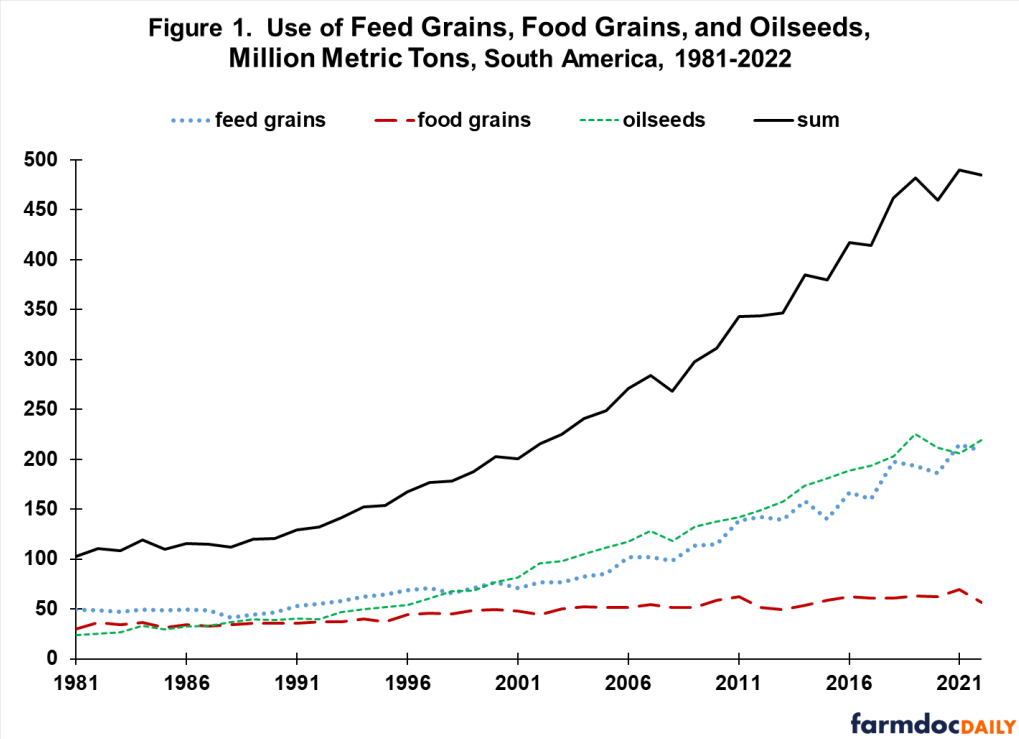
Grain and oilseed use and production in South America (SA) since 1980 are examined. While yields have grown faster than in the United States (US), land has been the primary reason that SA production has expanded rapidly since the mid-1990s. Stated alternatively, SA yields are increasing slower than the yield increase needed to meet the growth in SA use. Export growth is the primary driver of the increase in land, but growth in SA domestic use is also a factor. Similar analyses are available for the world (*farmdoc daily*, November 16, 2022), China ((*farmdoc daily*, December 19, 2022), United States (US) (*farmdoc daily*, November 21, 2022), and European Union (*farmdoc daily*, October 25, 2023).

Data

The data in this article are from the *Production, Supply, and Distribution Online* (PSD) database managed by the US Department of Agriculture, Foreign Agriculture Service. Feed grains are barley, corn, millet, oats, and sorghum. Food grains are rice, rye, and wheat. Oilseeds are cottonseed, peanuts, rapeseed, soybeans, and sunflowerseeds. The two largest producers of grains and oilseeds in South America are Brazil and Argentina.

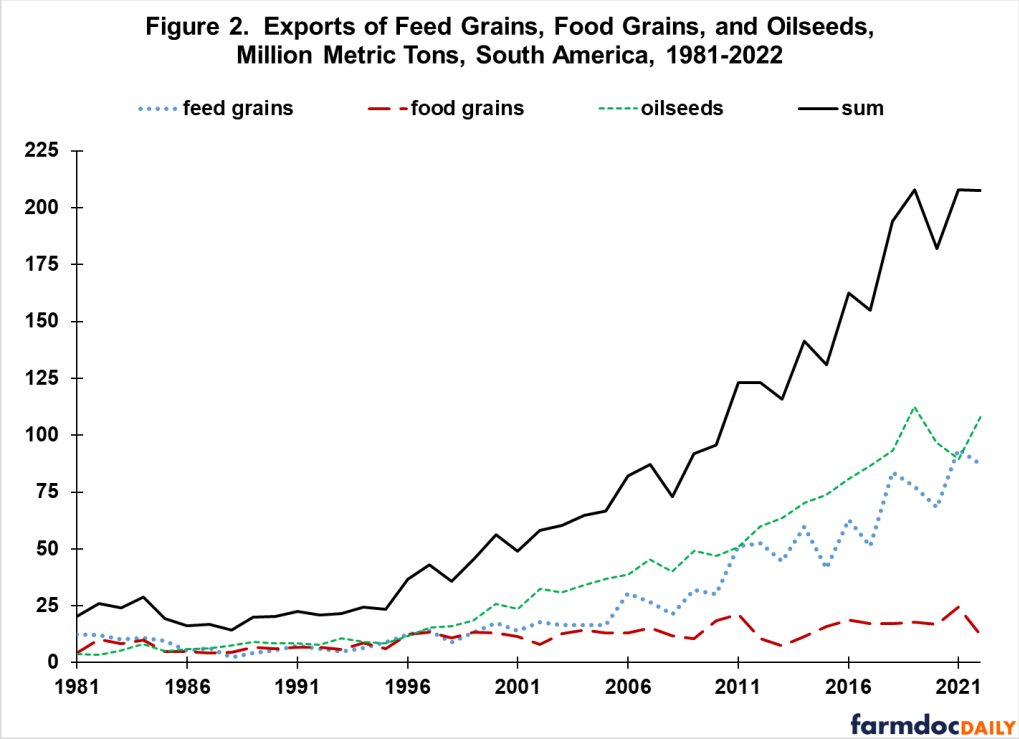
Use

Use (domestic consumption plus exports) of SA feed grains and oilseeds has grown at an increasing rate since 1980 (see Figure 1). Over the last 10 years, the annual rate of increase has averaged +5.8% per year for feed grains and +4.1% per year for oilseeds. The annual rate of increase in use of SA food grains has been constant over time. Over the last 10 years, it has averaged +3.0% per year.



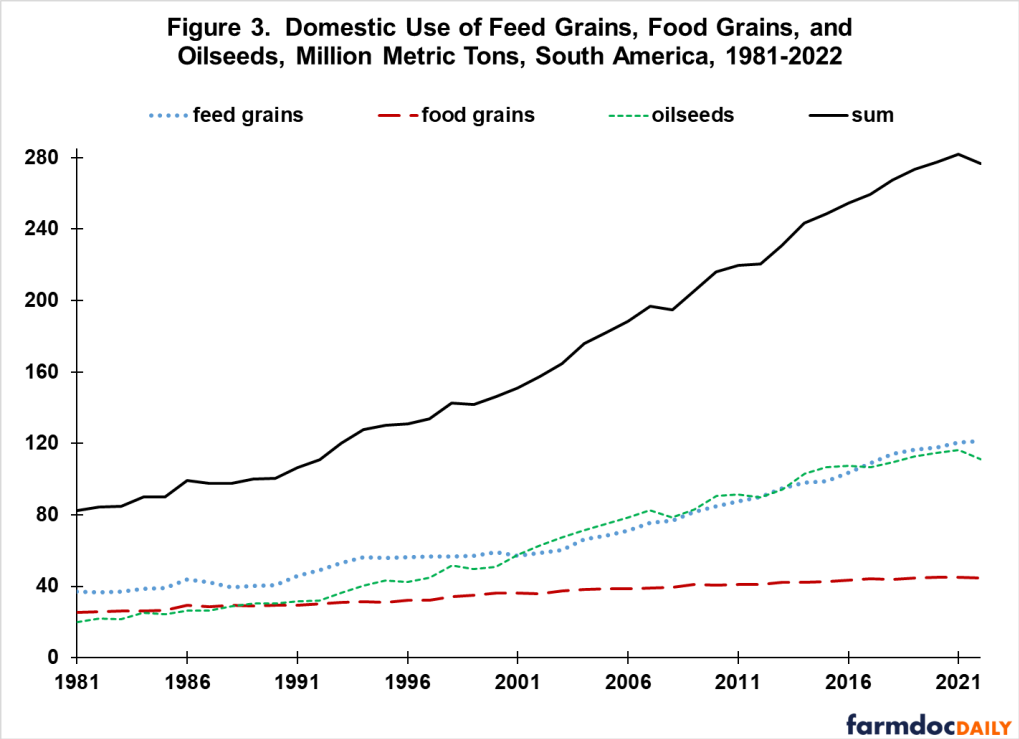
Exports

Exports of SA grains and oilseeds started growing in the mid-1990s (see Figure 2). Compared with 1991-1995 crop year exports, exports of the 2018-2022 crops were +1105% higher for feed grains, +1021% higher for oilseeds, and +156% higher for food grains.



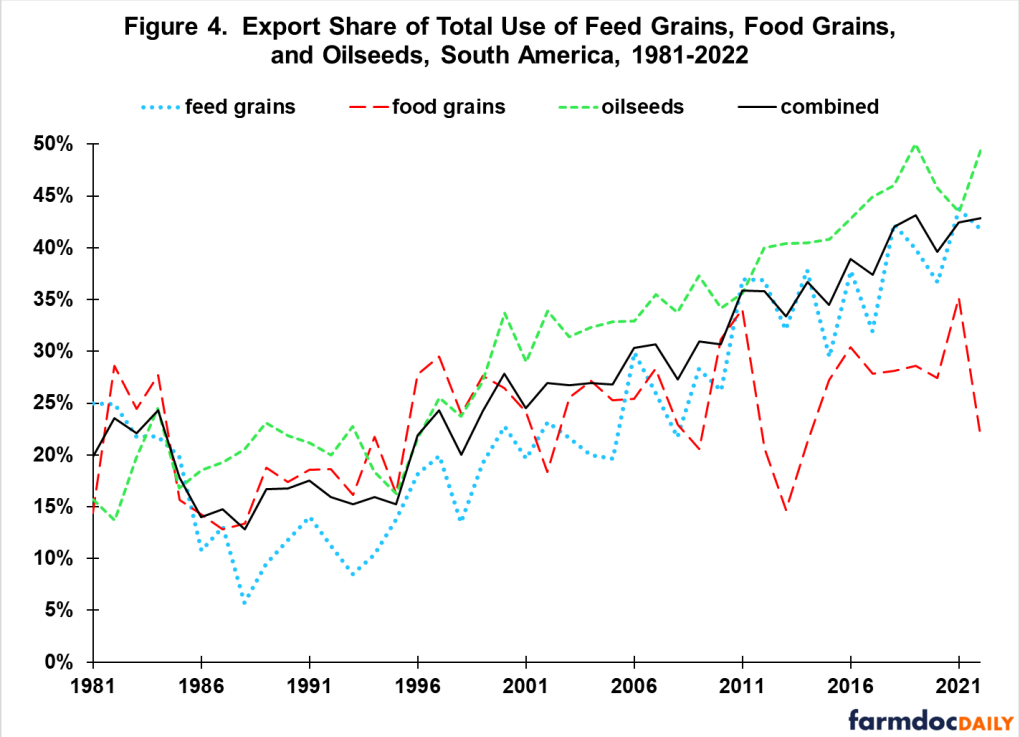
Domestic Use

SA internal (i.e. domestic) use has grown since the mid-1990s, especially for feed grains and oilseeds (see Figure 3). Compared with the 1991-1995 crops, SA domestic use of the 2018-2022 crops was higher by +207% for oilseeds, +127% for feed grains, and +46% for food grains.



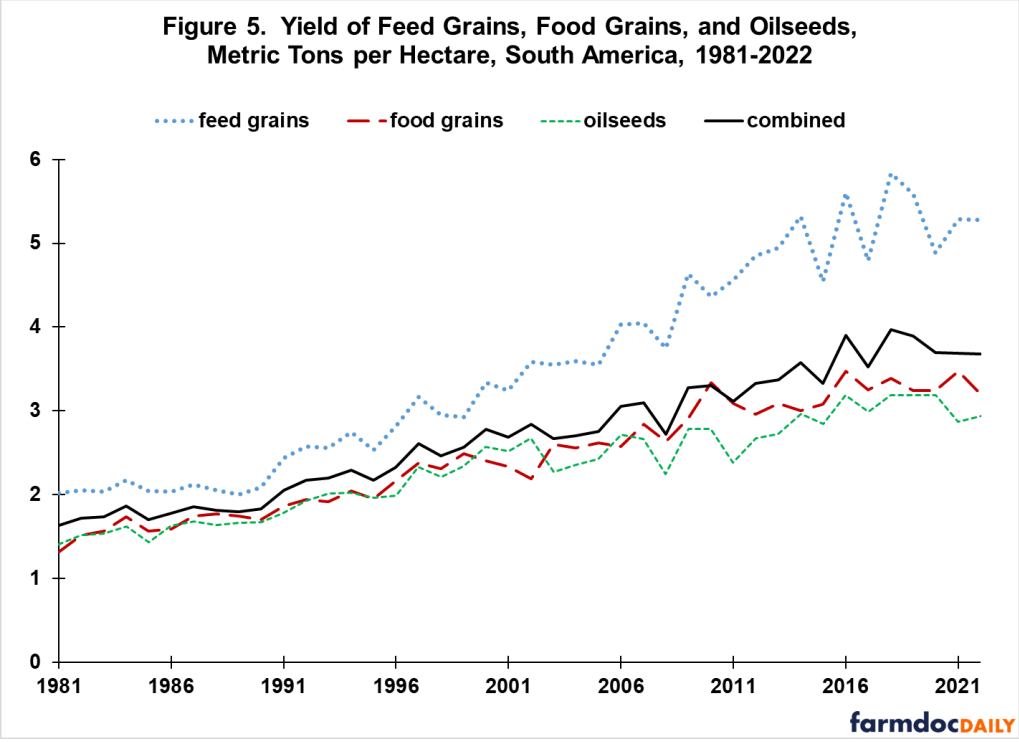
Export Share

Reflecting the much larger percent increases in exports than domestic use since 1995, export shares for SA grains and oilseeds have trended notably higher, especially for feed grains and oilseeds. Export shares are getting close to 50% for feed grains and oilseeds. The post-1995 growth in export shares stand in contrast to stable export shares from 1981 through 1995.



Yield

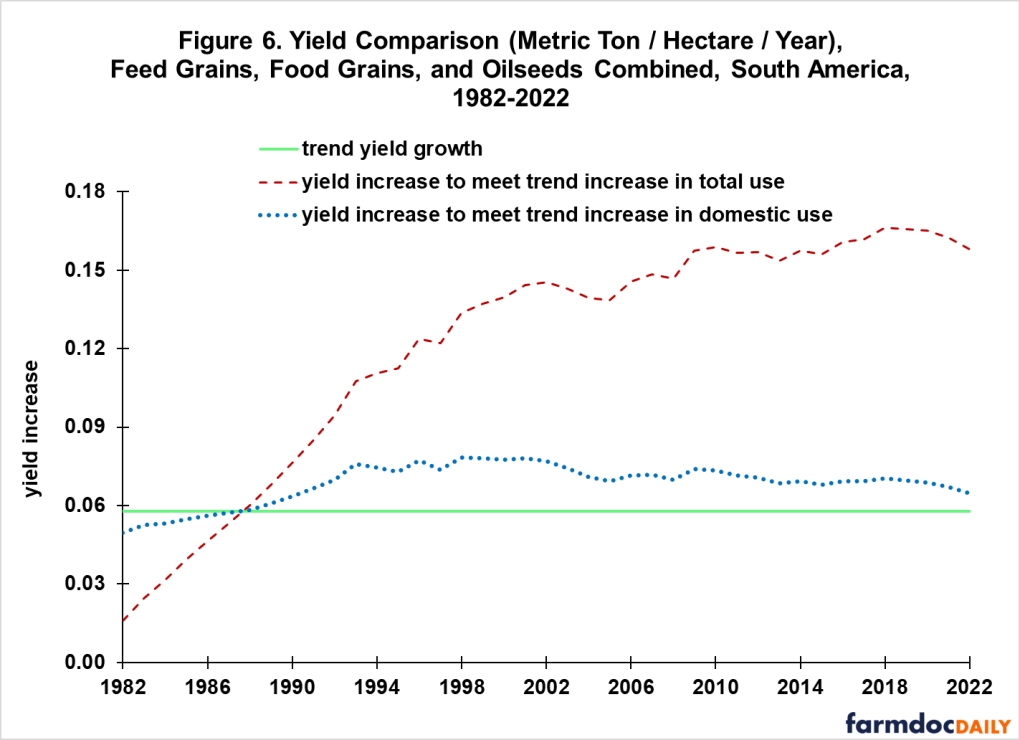
SA yield of feed grains, food grains, and oilseeds has trended consistently higher since 1980 (see Figure 5). Trend yield has increased at an increasing rate for feed grains but at a constant rate for food grains and oilseeds. Since 1981, the annual rate of increase has averaged +2.8% per year for feed grains, +2.4% per year for food grains, and +2.2% per year for oilseeds. Comparable averages for the US are lower: +2.3% per year for feed grains, +1.1% per year for food grains, and +1.8% per year for oilseeds.



Yield Gap

Figure 6 presents the increase in trend yield per year for combined SA production of feed grains, food grains, and oilseeds. Over the entire period from 1981 through 2022, combined trend yield increased by 160% (from 1.5 to 3.9 metric tons per hectare). Also presented is the increase in yield needed to satisfy the trend increase in combined total use and domestic use of SA crops assuming harvested land did not increase from the preceding year. See Data Note 4 in *farmdoc daily,* November 16, 2022 for an example of this calculation.

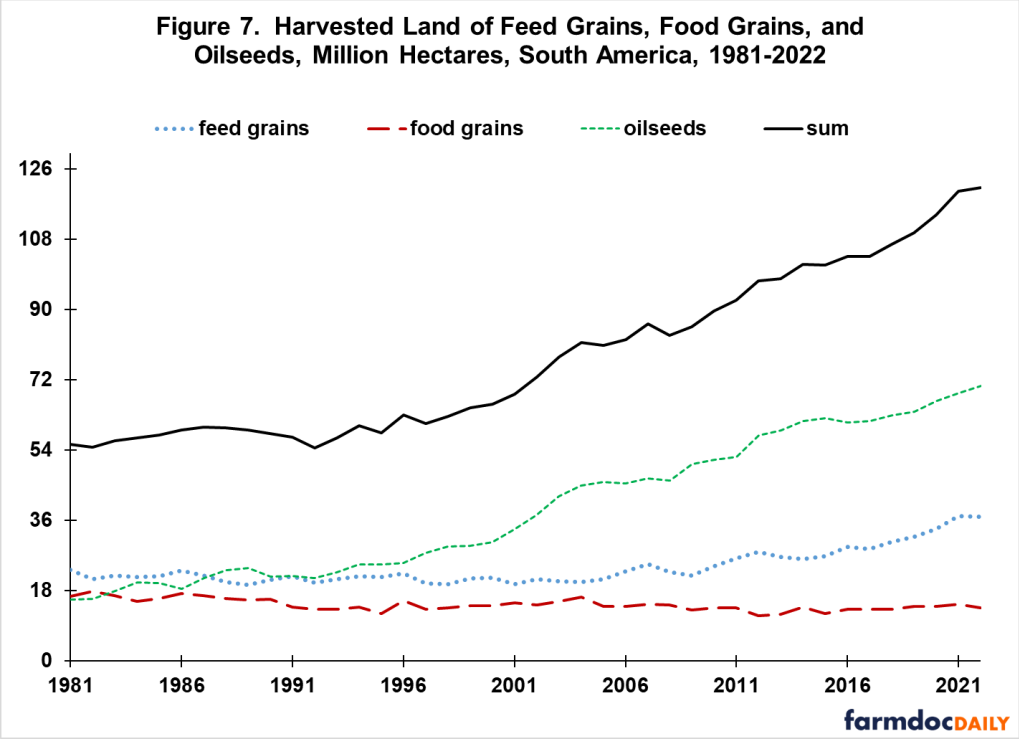
A deficit yield gap emerged for SA in the late 1980s for both total use and domestic use. The deficit yield gap for domestic use has been small and stable since the mid-1990s. The deficit yield gap for total use grew rapidly during the 1990s. The increase has slowed in the 21st Century, and, while not definitive, the deficit yield gap may have leveled off in recent years. Even if the deficit yield gap has stabilized, South America will need to increase harvested land if demand continues to grow.



Harvested Land

SA combined harvested grain and oilseed land fluctuated between 55 and 60 million hectares until 1995 (see Figure 7). A period of strong international commodity prices in the mid-1990s provided incentives to invest in agriculture and expand production. Brazil had also begun to initiate policy reforms to increase incentives to expand agricultural production. Since 1995, harvested grain and oilseed land in South America has increased on average by 2.8% per year. Feed grain and oilseed planted area has accounted for all the increase. Over the last 10 years, combined harvested area has increased 2.3 million hectares (equivalent to 5.8 million acres per year).

If harvested land had remained at its 1981 level and yield had increased as in Figure 5 and thus been the only source of increased output, South American combined production of grains and oilseeds would have increased by two-thirds less (an increase of 114 million metric tons compared to the actual increase of 355 million metric tons).



Discussion

Since the late 1980s, South America's trend yield for combined grains and oilseeds has grown slower than the increase in yield needed to meet the trend increase in combined use of its grains and oilseeds.

Export growth is the dominant reason for the deficit yield gap and the associated rapid increase in harvested South American grain and oilseed land.

While much smaller than the land needed to meet the growth in exports of grains and oilseeds, South America also needs more harvested land to meet its growing domestic use of these crops.

It can never be known what would have happened, but it seems likely that the world would be a very different place in terms of grain and oilseed supply, demand, and prices if harvested land and by extension production had not expanded so rapidly in South America.

References and Data Sources

US Department of Agriculture, Foreign Agriculture Service. November 2023. Production, Supply, and Distribution Online. https://apps.fas.usda.gov/psdonline/

Zulauf, C. "China and the World's Increasing Need for Cropland." *farmdoc daily* (12):192, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, December 19, 2022.

Zulauf, C. "US Feed Grain, Oilseed, and Food Grain Land since 1980." *farmdoc daily* (12):176, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, November 21, 2022.

Zulauf, C. "The World's Increasing Need for Cropped Land." *farmdoc daily* (12):173, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, November 16, 2022.

Zulauf, C., J. Colussi and G. Schnitkey. "European Union Self Sufficiency in Grains and Oilseeds since 1980." *farmdoc daily* (13):196, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, October 25, 2023.

Zulauf, C., G. Schnitkey, N. Paulson and J. Colussi. "Concentration of US Crops in Corn and Soybeans: Importance to Increasing US Production of Grains and Oilseeds." *farmdoc daily* (13):173, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, September 22, 2023.