



Foreign Agricultural Service

Global Market Analysis

International Production Assessment Division

Web: <https://ipad.fas.usda.gov>

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Commodity Intelligence Report

Brazil Soybeans 2020/21: Another Season with a Record Harvest

Brazil's soybean harvest is mostly complete for MY 2020/21 with production estimated at a record 137.0 million metric tons (mmt, Figure 1), up 8.5 mmt (7 percent) from last season's record crop of 128.5 mmt. The area harvested this season is also at a record of 38.6 million hectares (mha), up 1.7 mha (5 percent) from last season's record. Soybean yield is estimated at a record of 3.55 tons per hectare (t/ha), up 2 percent from last season, up 7 percent from the 5-year average and slightly below the 10-year trend (3.60 t/ha). The previous record yield was attained in 2017/18 at 3.51 t/ha.

Summary of MY 2020/21

The soybean crop is planted in Brazil beginning in mid-September through the end of December for most soybean areas (Figure 2). The exact planting dates depend on the end of the local soybean moratorium (to control for Asian Soybean Rust) and commencement of rains in a specific region. For this season, the lack of precipitation (Figure 4b) and extremely dry soil conditions at the start of the growing season led to significant delays in planting. The Standardized Precipitation Index (SPI) reflects the second driest 2-months (October-November) in the past 30 years (Figure 4a) in cropland areas, with greater than 60 percent of cropland area affected. Once the delayed rains finally arrived and replenished soil moisture levels in the center-est states, where a large majority of soybeans are grown (Figure 2-3), planting pace was rapid. The Mato Grosso Institute of Agricultural Economics (IMEA) reported that 67 percent of the area was sown in about 30 days.

Fortunately for soybean producers, abundant rainfall was received from December through March during the critical crop development stages from bloom to seed development. This helped to boost yields in a number of states in the Center-West (about 40 percent of production, Figures 2-3) and south (over 30 percent of production); for example, in Goiás and Rio Grande do Sul (Figures 5-6). In the case of Rio Grande do Sul, the staggered planting combined with abundant solar radiation and sufficient rainfall when it was needed, catapulted production over 20 mmt. The Normalized Difference Vegetation Index (NDVI) during the growing season displays a maximum vegetation biomass (a proxy for relative crop yield), which would suggest a record yield (Figure 5). This season was a stark contrast from the 2019/20 season when rainfall was below average and crop conditions were poor as reflected in the Percent of Average Seasonal Greenness (PASG) over the same 3-month period (Figure 6). In contrast, vegetation

indices for the largest soybean producer, Mato Grosso, indicated vegetation biomass below last season (Figure 5), likely due to insufficient rainfall early in the season. For Paraná and Tocantins, the rains in February were excessive and led to a loss in yields.

Area, Yield, and Production Trends

Planted area grew by about 14 percent over the past 5 years with the largest area expansion occurring in the Center-West and the Northeast. With little available land in the south, area growth was relatively lower in this region (Figures 3, 8-9). Within the last 10 years, several large states saw a near doubling in area, Mato Grosso, Mato Grosso do Sul and Minas Gerais (Figure 9). For the largest producer, Mato Grosso, area grew 60 percent while production grew 75 percent. In the next two large states, area expansion was lower but production increased about 40 percent and 75 percent in Paraná and Rio Grande do Sul respectively (Figure 9). Overall, soybean area has almost doubled and production has more than tripled within a 20 year timespan (Figure 1).

Yields in most Center-West states were lower compared to last season with the exception of Goiás (Figure 7) which posted yields above 3.7 t/ha as reported by *Companhia Nacional de Abastecimento* (CONAB, an agency in the Brazilian Ministry of Agriculture). In the south, Paraná suffered the greatest yield loss of almost 10 percent from the prior season because of excessive rainfall just before harvest. The two states with record yields are Bahia and Rio Grande do Sul, with the former posting yields close to 4 t/ha and the latter above 3.4 t/ha. The timely rains boosted yields in Rio Grande do Sul 77 percent from last year's drought-affected crop. The longer term trends for soybean yields show gains relative to the 5-year average for all states except for Santa Catarina (Figure 8). Investments in inputs in the MATOPIBA region (Maranhão, Tocantins, Piauí, and Bahia) paid off with significant gains in yield.

Future Outlook

USDA forecasts MY 2021/22 harvested area at 40.4 mha, up nearly 5 percent. The larger area for 2021/22 is expected to result in yet another record production of 144.0 mmt. If the current high global soybean prices are sustained, it is anticipated that Brazilian farmers will plant a larger soybean area consistent with the recent area expansion of at least three percent per year. With transportation costs steeply reduced from the opening of the BR-163 highway and consecutive seasons of record production, farmers can invest a greater amount in fertilizers and other inputs for next season. In order to achieve good yields in the cerrado biome of the Center-West and Northeast (Figure 3), farmers need to use soil amendments and fertilizers because the cerrado soil is nutrient-poor. Additionally, a high adoption of new seed technology will continue to drive yields higher and mitigate losses from pathogens and climate variability. These area increases are expected to continue on land currently in pasture which is plentiful in the Center-West and several other regions.

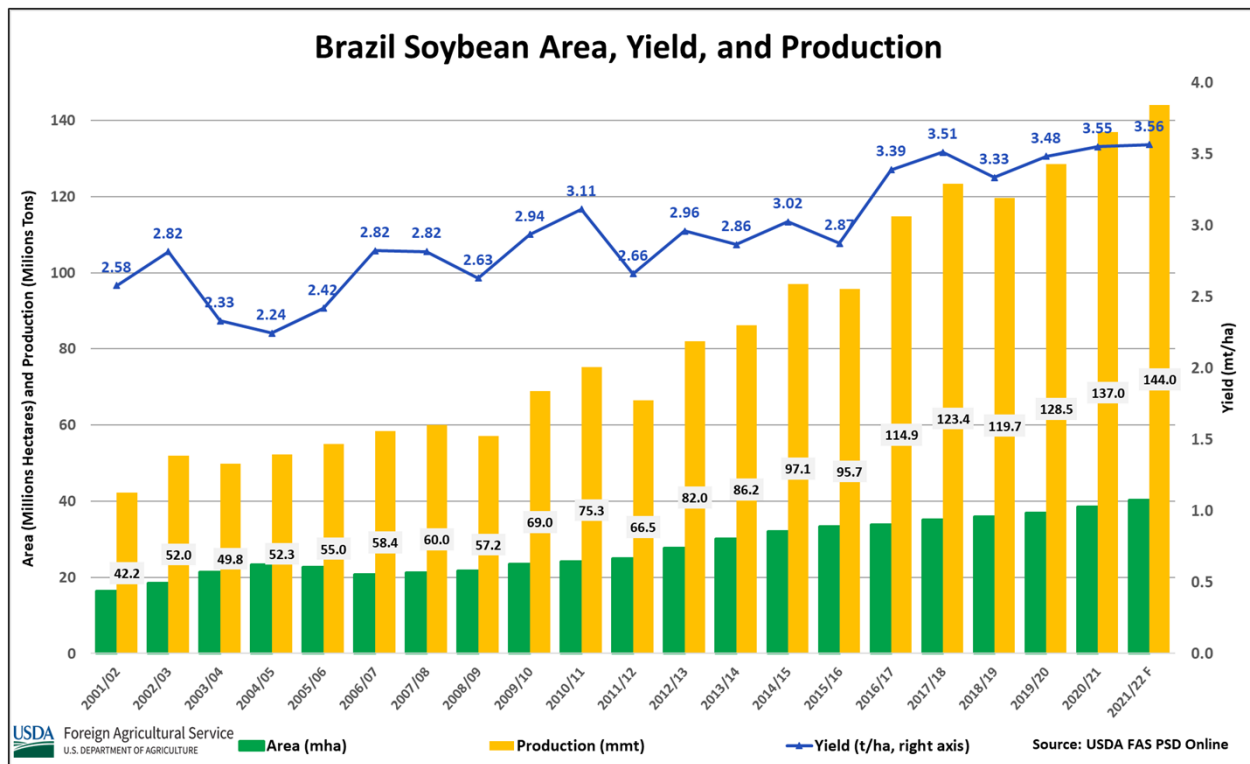


Figure 1. Brazil Soybean Area, Yield and Production time series chart. Source USDA PSD Online.

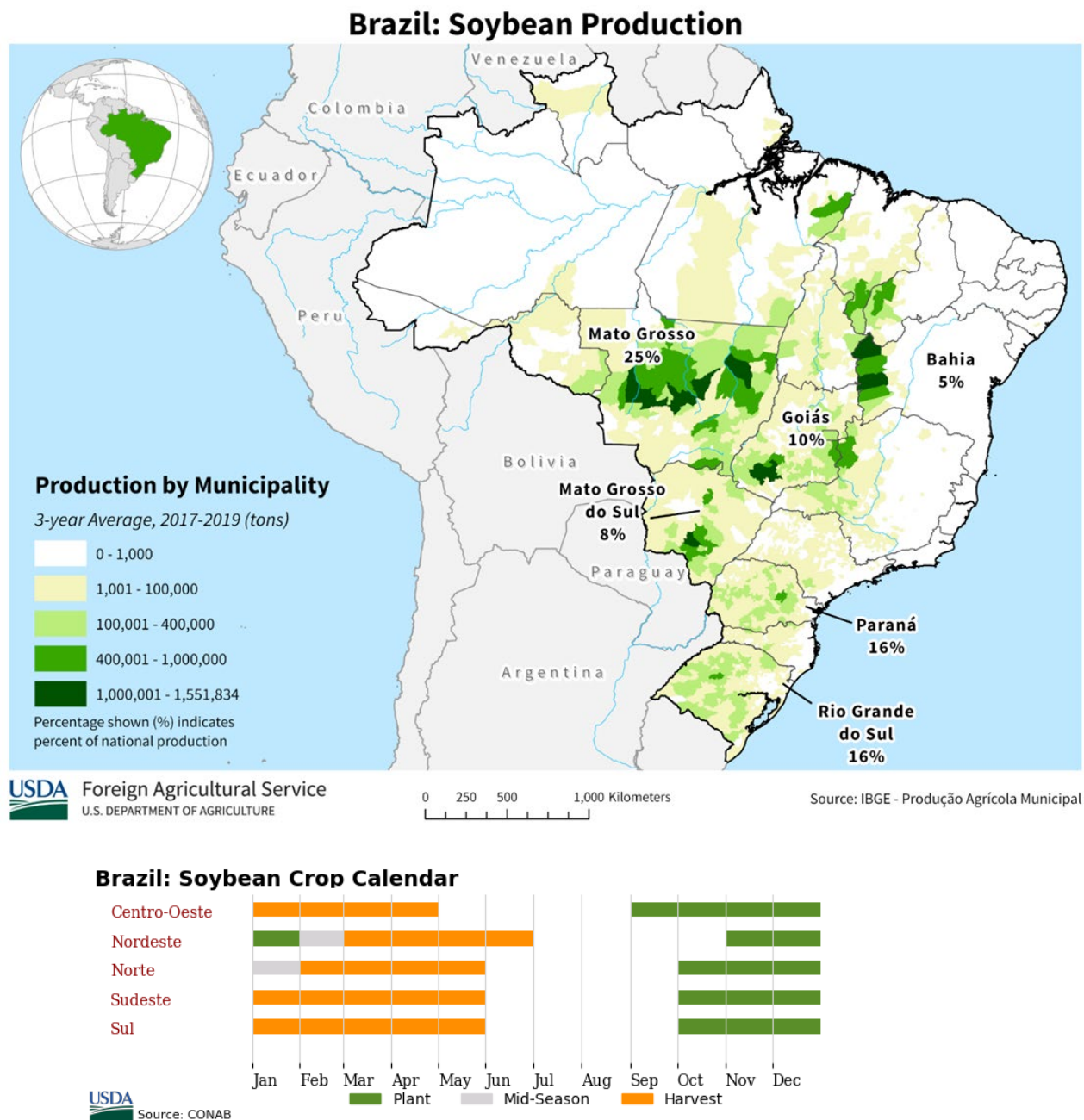


Figure 2. Brazil is the single largest global national producer with a record 137 mmt in 2020/21, accounting for 37% of global production. The majority of soybeans are grown in the Center-West and southern states. Source: IBGE.

Brazil Biomes

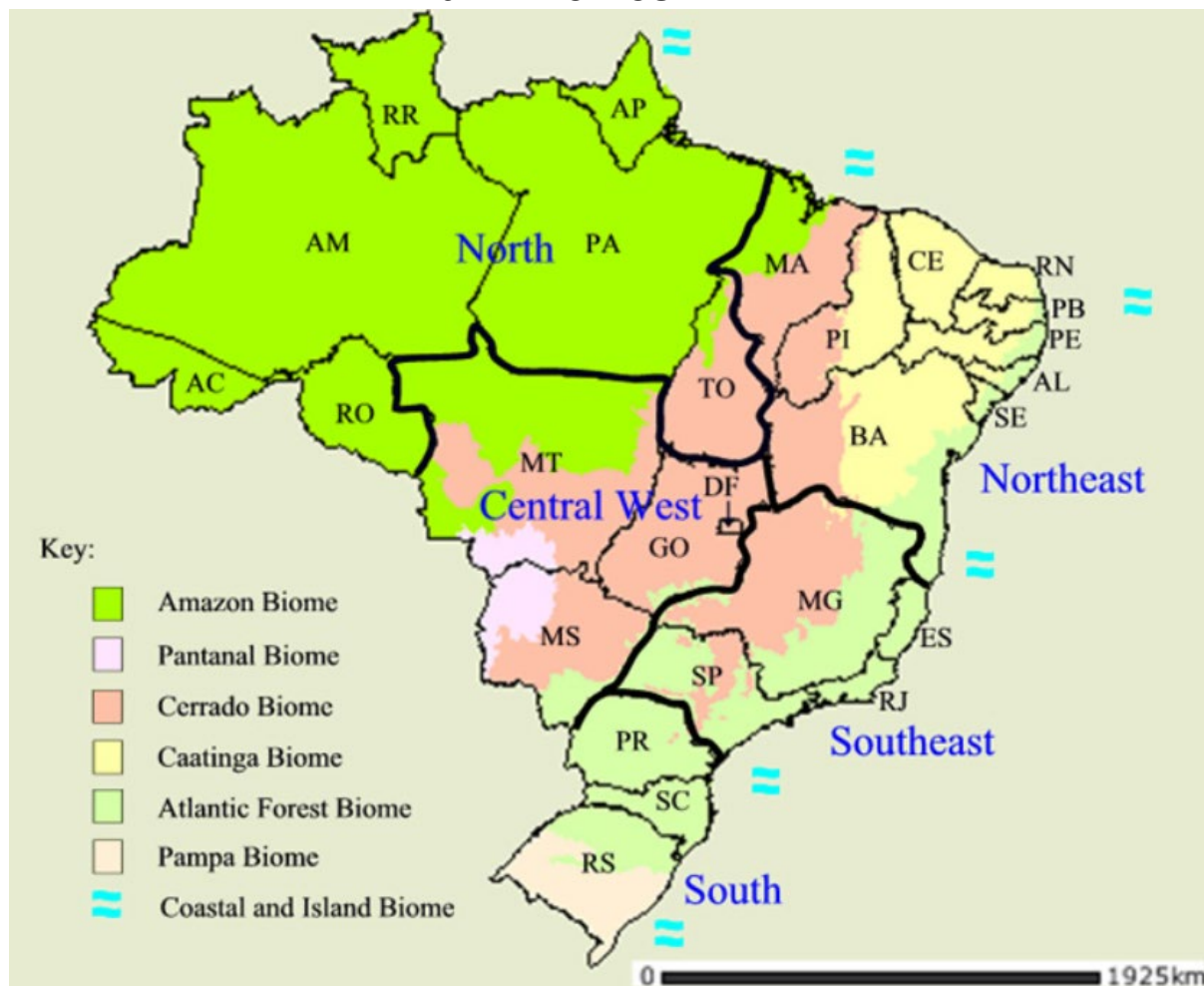
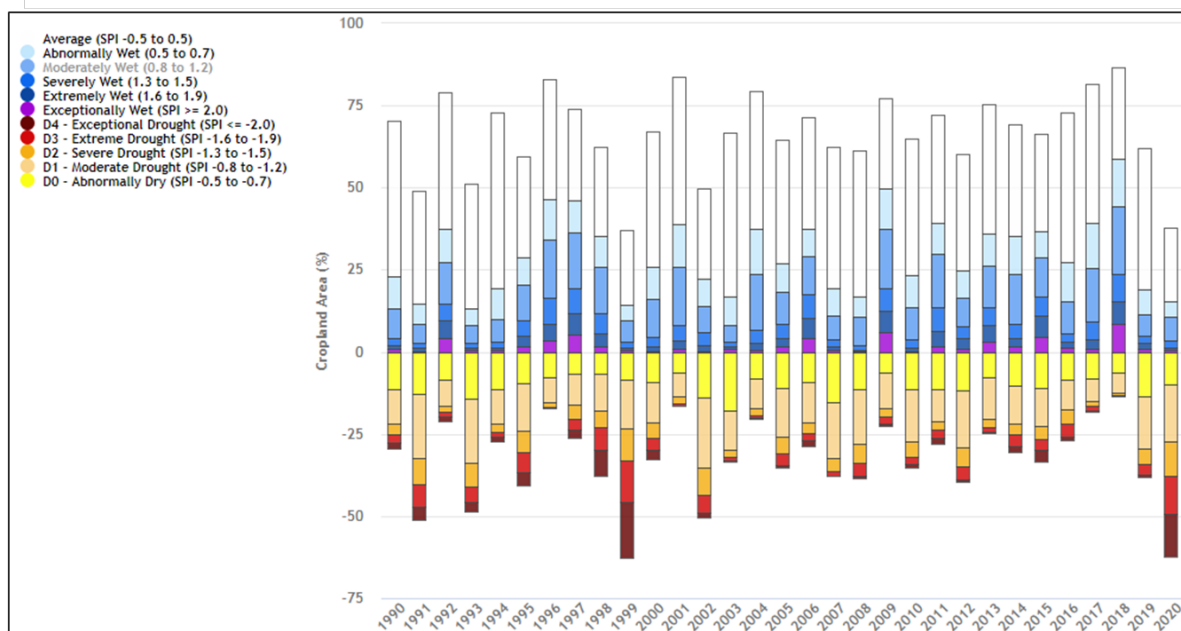
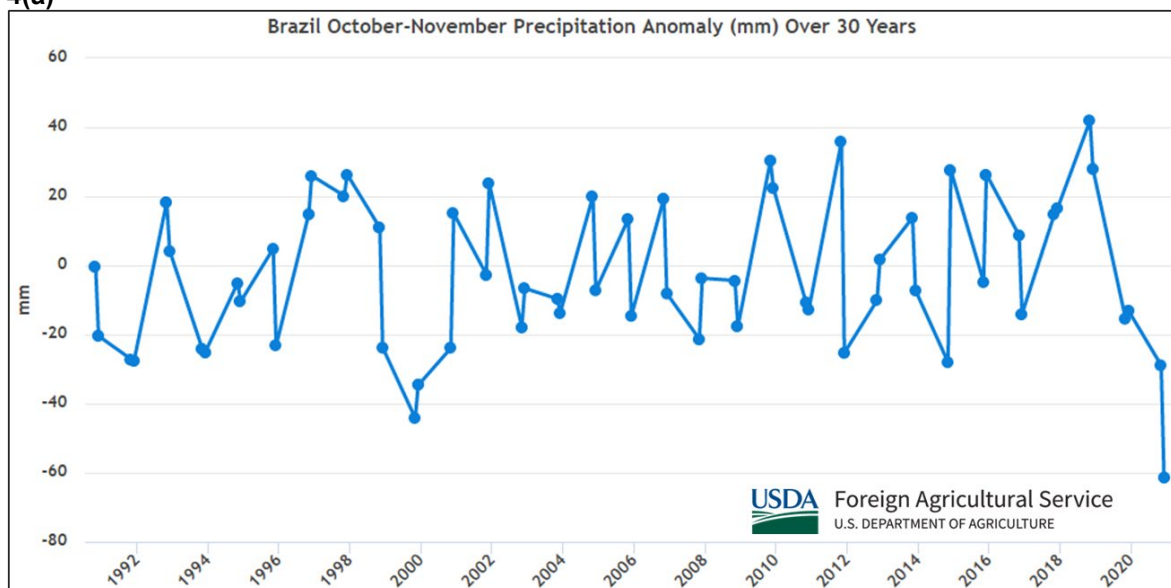


Figure 3. The majority of Brazil's soybeans are grown in the cerrado and atlantic forest biomes. Source: IBGE data, Hargreaves, P. (2008). Phytosociology in Brazil. *J Plant Sci Biotechnol*, 2, 12-20.

Brazil Soybeans 2020/21: Standardized Precipitation Index (SPI) for October-November over 30 Years



4(a)



4(b)

Figure 4. (a) The SPI compares the current monthly precipitation to the long-term average. The 2-months of October-November for 2020/21 were the second driest on record in cropland areas. (b) The precipitation departure from average was the greatest during October-November in the past 30 years; ~60 millimeter (mm) difference from the long-term average for the month of November. Source: CHIRPS UCSB.

Brazil Soybeans: Vegetation Indices

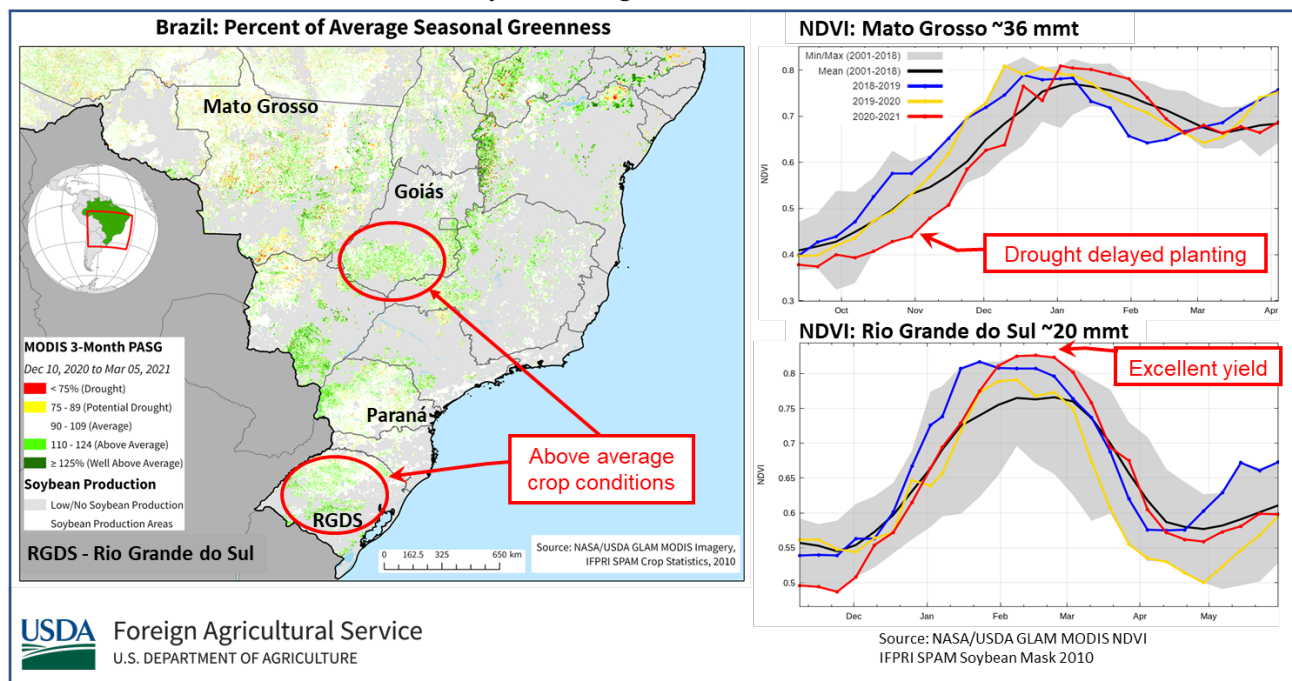


Figure 5. The Percent of Average Seasonal Greenness (PASG) compares the 3-month vegetation conditions from this season to a long-term average. Indices such as the PASG and NDVI help to estimate vegetation biomass and relative crop yields over a season. Both metrics reflect slightly above average vegetation biomass in Mato Grosso, although below last season's excellent crop. For Rio Grande do Sul and Goiás, PASG and NDVI reflect record or near record yields. Source: NASA/USDA GLAM MODIS NDVI, IBGE.

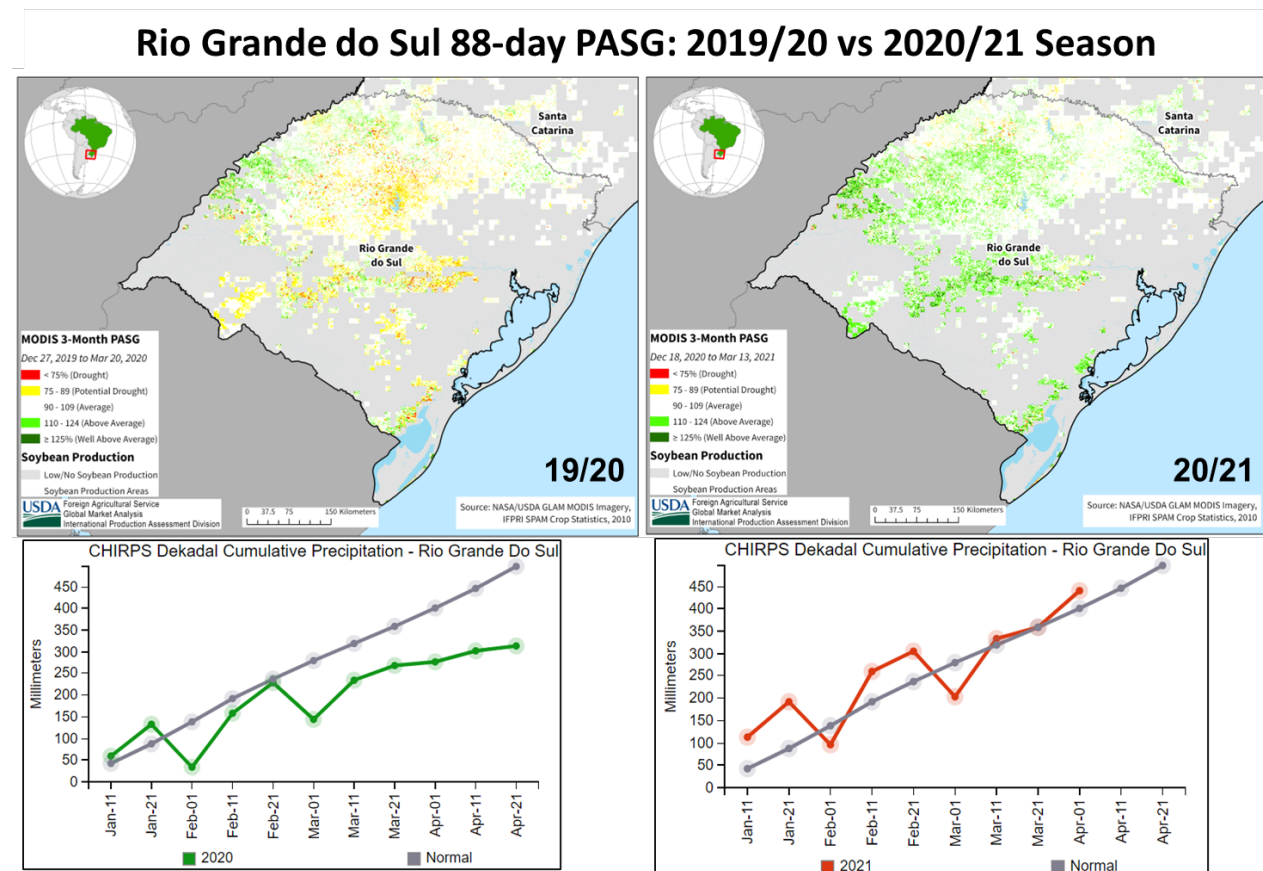
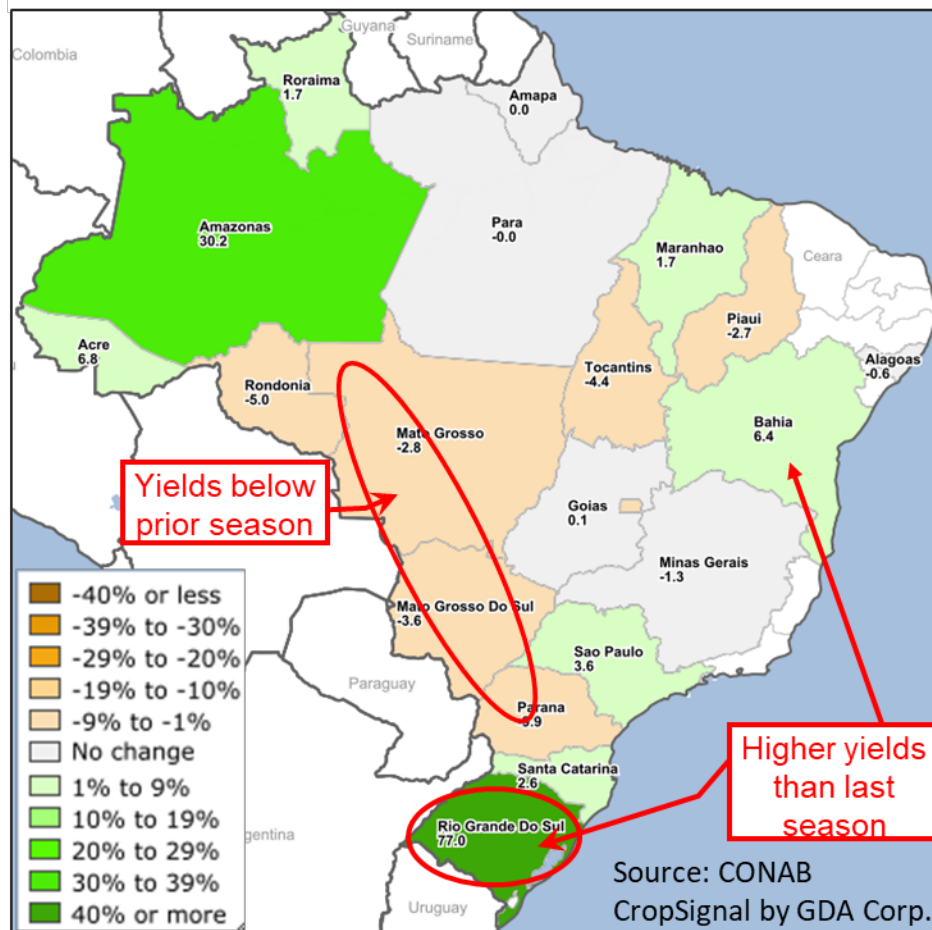


Figure 6. The 3-month PASG for Rio Grande do Sul for this season compared to the last season displays the glaring contrast in vegetation vigor due to the rainfall amount. Crop development was excellent this year as displayed by more green areas this season. Precipitation was below average for much of last season versus above average for the current season. Sources: NASA/USDA MODIS GLAM, CHIRPS UCSB.

Yield Difference from Current to Prior Season



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Figure 7. Yield Difference from the 2020/21 season to the 2019/20 season. Source: CONAB.

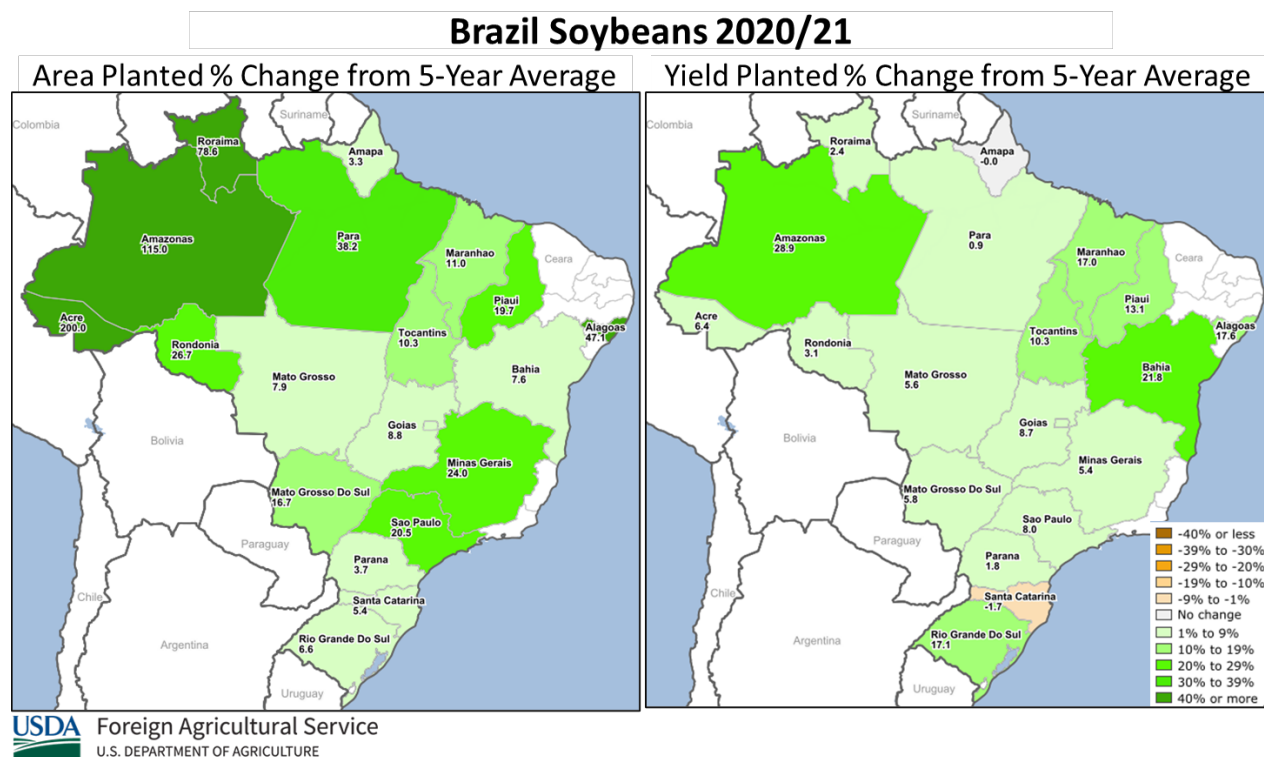
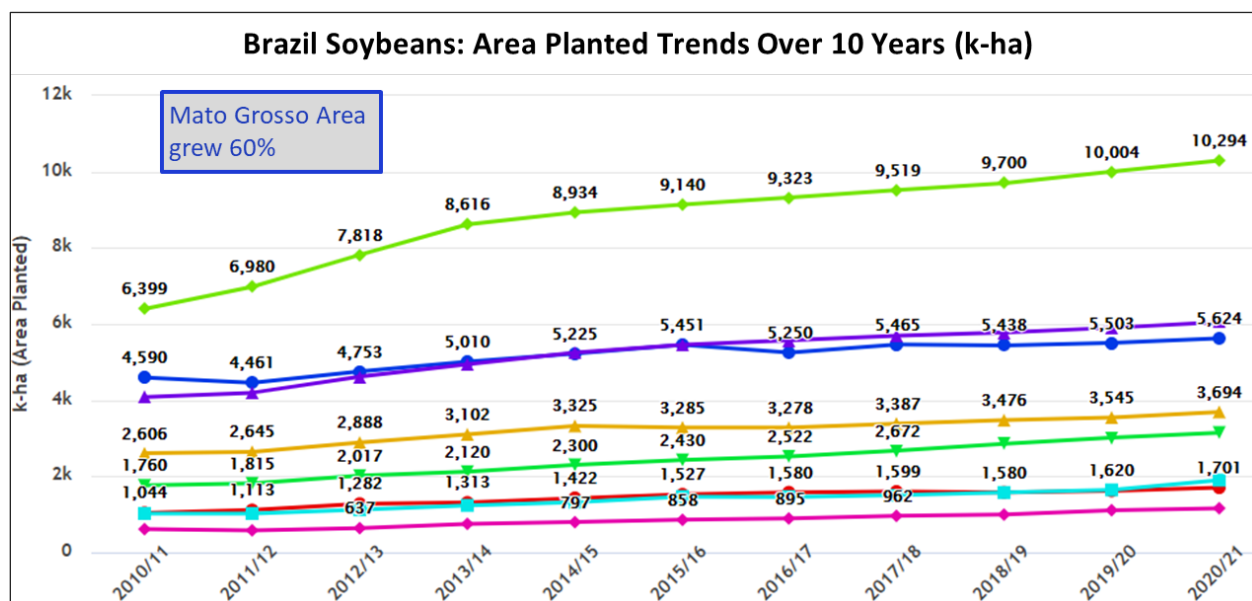
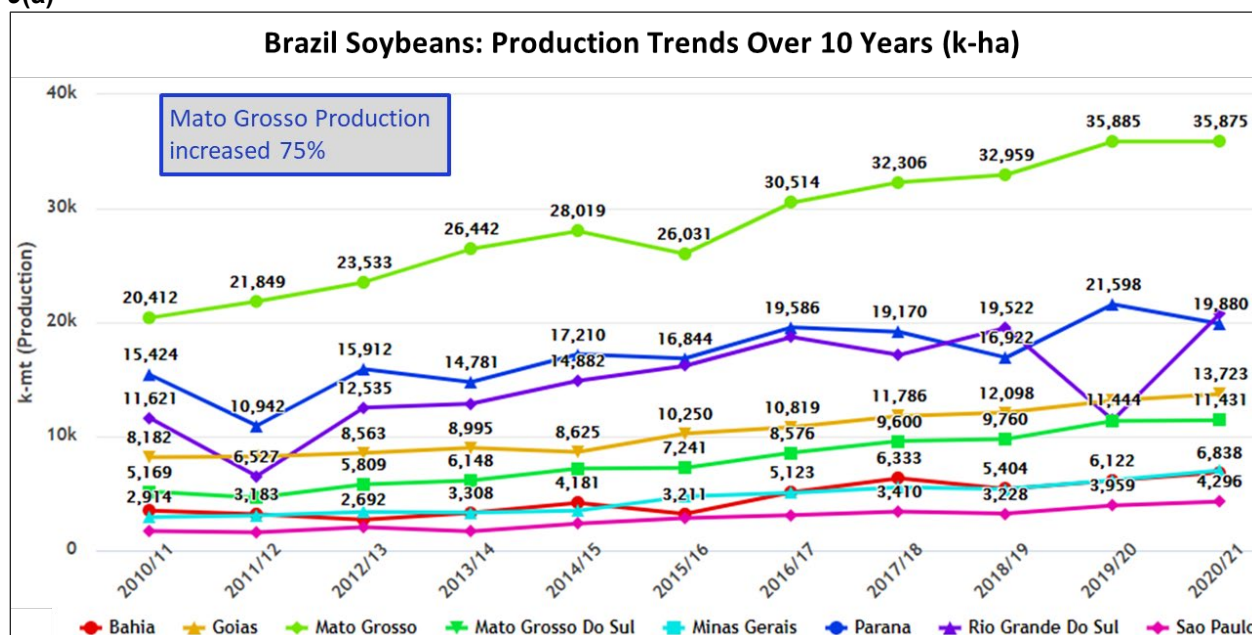


Figure 8. Brazil soybean area has grown 14% nationally compared to the 5-year average. The largest area increases occurred in the Southeast (São Paulo and Minas Gerais) and the north (Rondônia, Pará, and Tocantins). While the percent increase is large in the Amazon states, these are a minority of overall production. Yield gains were the greatest in the Northeast region overall. Source: CONAB.



9(a)



9(b)

Figure 9. Soybean area and production has grown in all major soybean producing states. The largest area and production increase occurred in Mato Grosso. Area increases have been the lowest in Paraná and Rio Grande do Sul where available land is scarce. Source: CONAB
NOTE: k-ha = thousand hectares, k-mt = thousand metric tons.

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