United States Department of Agriculture

Foreign Agricultural Service
Global Market Analysis
International Production Assessment Division
Web: https://ipad.fas.usda.gov

August 26, 2020

Commodity Intelligence Report

Brazil Corn Production: Drought in the south for *safrinha* corn combined with high yields in the center balance production for 2019/20

In spite of the severe drought experienced in the southern states during the *safrinha* corn season, overall corn production in Brazil for 2019/20 remains at record levels, because of the positive offsets in Mato Grosso, Goiás, and the northeastern region. USDA estimates 2019/20 Brazil corn harvested area at 18.4 million hectares, with total production at 101 million metric tons and yield at 5.49 tons per hectare (Figure 1).

The corn crop in Brazil is planted during two seasons, with the first-season crop planted from early-September to December and harvested from January to June in southern Brazil, and the second-season, or *safrinha*, crop planted from January through mid-March and harvested from May to September (Figure 2). This article will focus on the contrasting crop condtions for the *safrinha* crop in southern Brazil and in the Center-West states of Mato Grosso and Goiás, as well as analyzing recent trends.

Drought in Southern Brazil

The primary areas affected by this intense and historic drought during March were in the north and center of Paraná state and in the southeastern region of Mato Grosso do Sul. In Paraná, this was the most severe or second most severe drought on record (Figure 3), occurring towards the tail end of planting in March and the early growing season from March through May, when crops had progressed to the vegetative stage. Year-to-year comparison of crop condition rating for Paraná, by the Department of Rural Economy of the Paraná State Secretary of Agriculture and Supply (SEAB-DERAL), indicates a sharp drop below 50 percent by mid-May in the good to excellent category for 2019/20. This is in contrast with almost 90 percent rated good or excellent in 2018/19 (Figure 4). The proportion rated fair in August is close to 40 percent for 2019/20 versus 20 percent last year, and the crop rated as poor or very poor is the second worst in recent years (Figures 4 and 5, SEAB-DERAL).

Comparison of Vegetation Metrics among Regions

Satellite-derived vegetation analysis with the Normalized Difference Vegetation Index (NDVI) and percent of average seasonal greeness (PASG) reveals the same narrative. The PASG is a vegetation metric that computes the vegetation conditions for portions of the growing season relative to the long-term average for comparable time periods.

Evaluating the PASG and NDVI signatures for various corn regions indicates a harvest above average for Mato Grosso and Goiás, but a below average yield for Paraná and Mato Grosso do Sul (Figures 6 and 7). Particularly striking in the NDVI comparison is the trend for Paraná this season, which is below the past six years on record for much of the growing season (Figure 7).

Regional Trends for the Past Six Years

Brazil's second-season corn production shows increasing trends over the past six years for much of the country. For the state of Mato Grosso, which produces about half of the *safrinha* corn crop (Figure 2), the National Supply Company of Brazil (CONAB) estimates a production increase this season of 40 percent, area increase of 28 percent, and yield at 10 percent above the five-year average. The states of Paraná and Mato Grosso do Sul, in contrast, are estimated to have yield decreases up to 3 percent below the five-year average (with area increases at roughly 4 and 7 percent, respectively; a production increase slightly under 1 percent for Paraná and over 6 percent for Mato Grosso do Sul). Year-over-year yield decreased by about 7 percent in Mato Grosso do Sul and 25 percent in Paraná.

With the exception of Goiás and Minas Gerais, the largest *safrinha* production increase has been in the northeastern states of Pernambuco, Tocantins, and Maranhão (over 85 percent relative to the five-year average, Figure 8). However, the crop area in these states as a proportion of the total production is less than 5 percent for 2019/20, except for Goiás which is 14 percent of the total production. Area increases in the top five *safrinha* corn states is marked by year-over-year growth in Mato Grosso, with a total increase of 61 percent over the last six years, and the over 74 percent increase in the state of Minas Gerais (which is about 4 percent of the total production, Figure 9). The most recent growth trends, however, have been in the northeast, with an increase of almost 90 percent over six years (Figure 9). Nevertheless, yields in the northeastern states have not kept pace with the main *safrinha* regions, remaining consistently below the top producing states and below 4.5 tons per hectare (Figure 9). Total *safrinha* corn area and production increased by 44 and 37 percent respectively since the 2014/15 season.

About 90 percent of the current *safrinha* corn production is in four states, two of which (Paraná and Mato Grosso do Sul) displayed a reduction in yields due to drought, that was offset by a favorable harvest in the other two states (Mato Grosso and Goiás), as well as in the northeast.

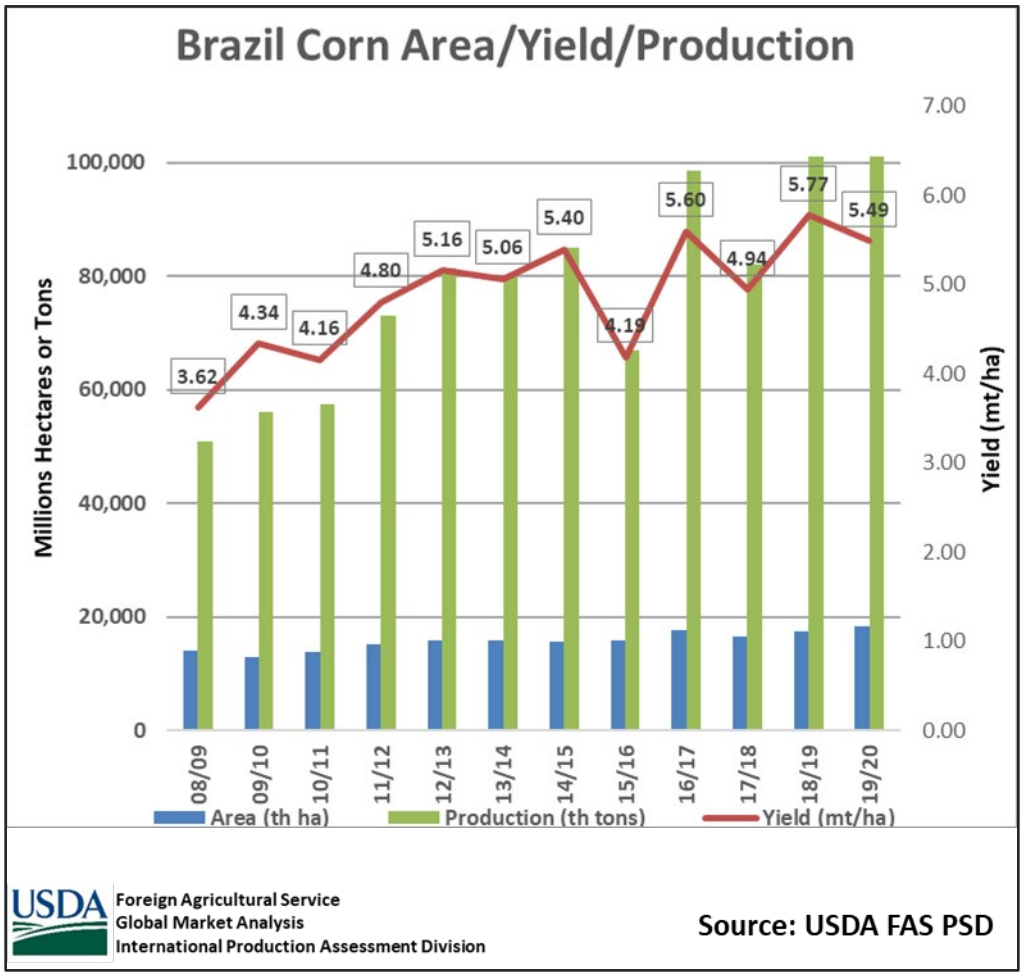

Figure 1. Area, Production, and Yield history for the past 10 years. Source: USDA.

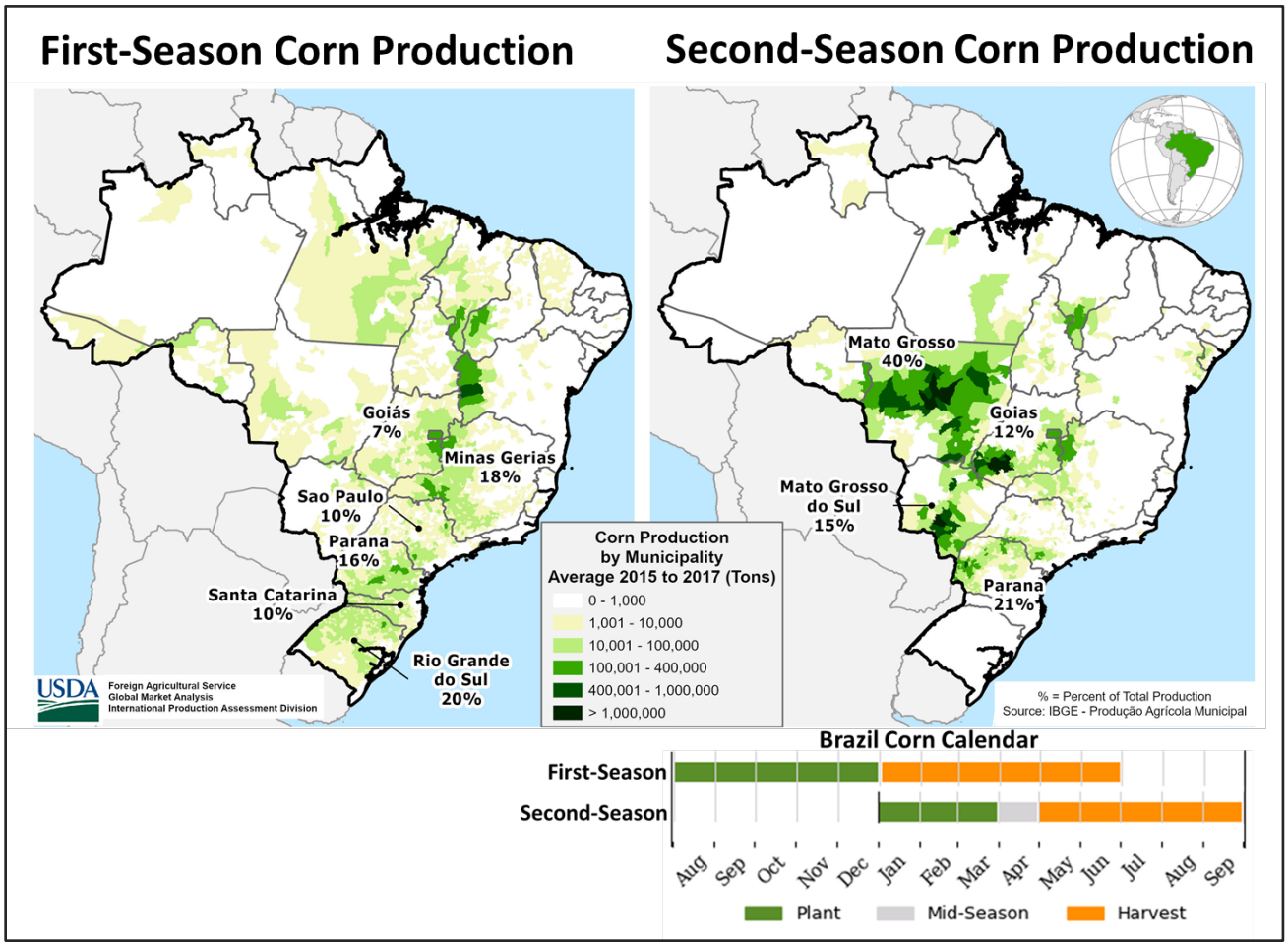

Figure 2. First and Second season corn production areas. Roughly 25% of total corn is harvested during the first crop season versus 75% during the second season. Source: IBGE.

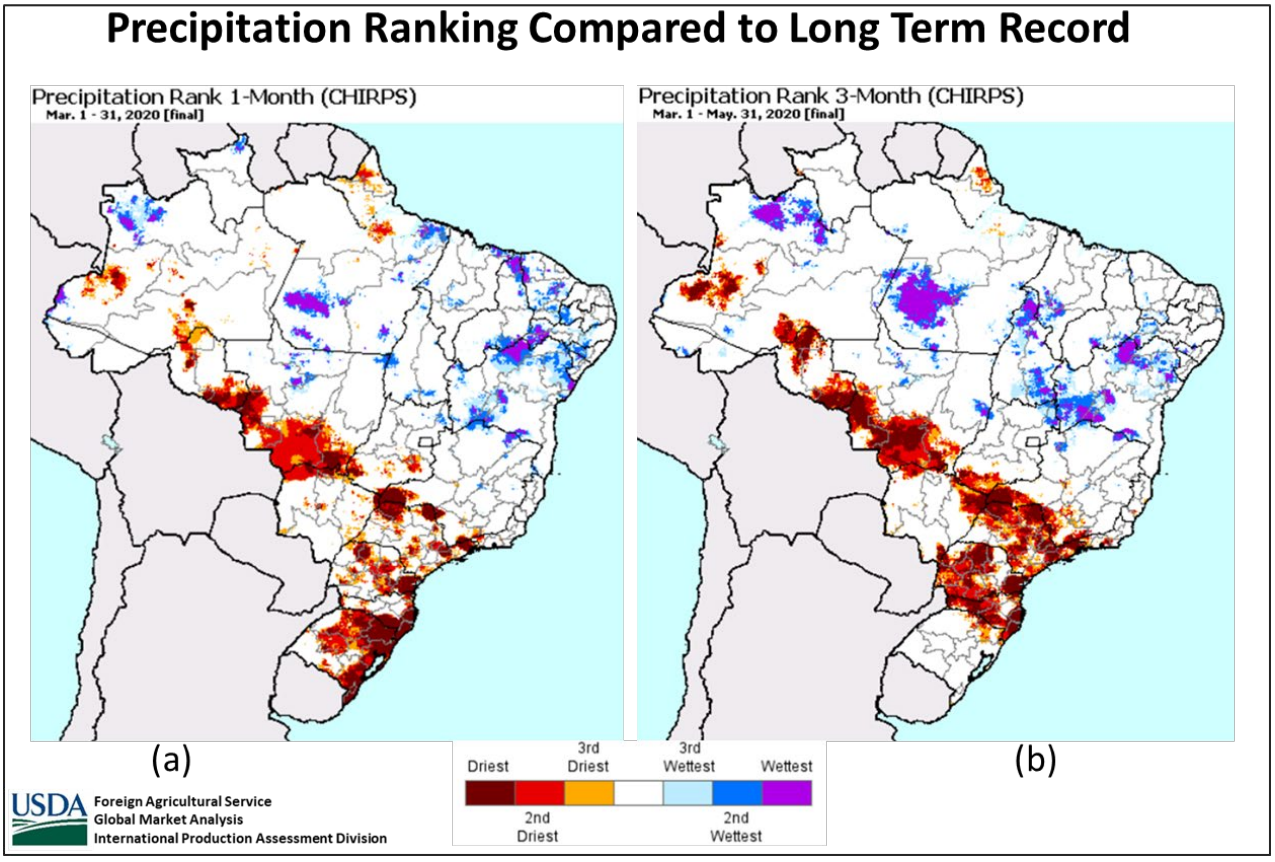

Figure 3. Precipitation ranking in comparison to long term record for (a) 1 month, March 1-31 2020 and (b) 3 months including March – May 2020. Northern regions of Paraná were the driest on record, with central Paraná experiencing the second driest period in March 2020.
Source: UCSB CHIRPS.

Figure 4. Year-over-year comparison of crop condition rating for Paraná. By early August, the proportion of crop rated poor this year had risen to almost 20% versus less than 10% in 2018/19. Source: SEAB/DERAL.

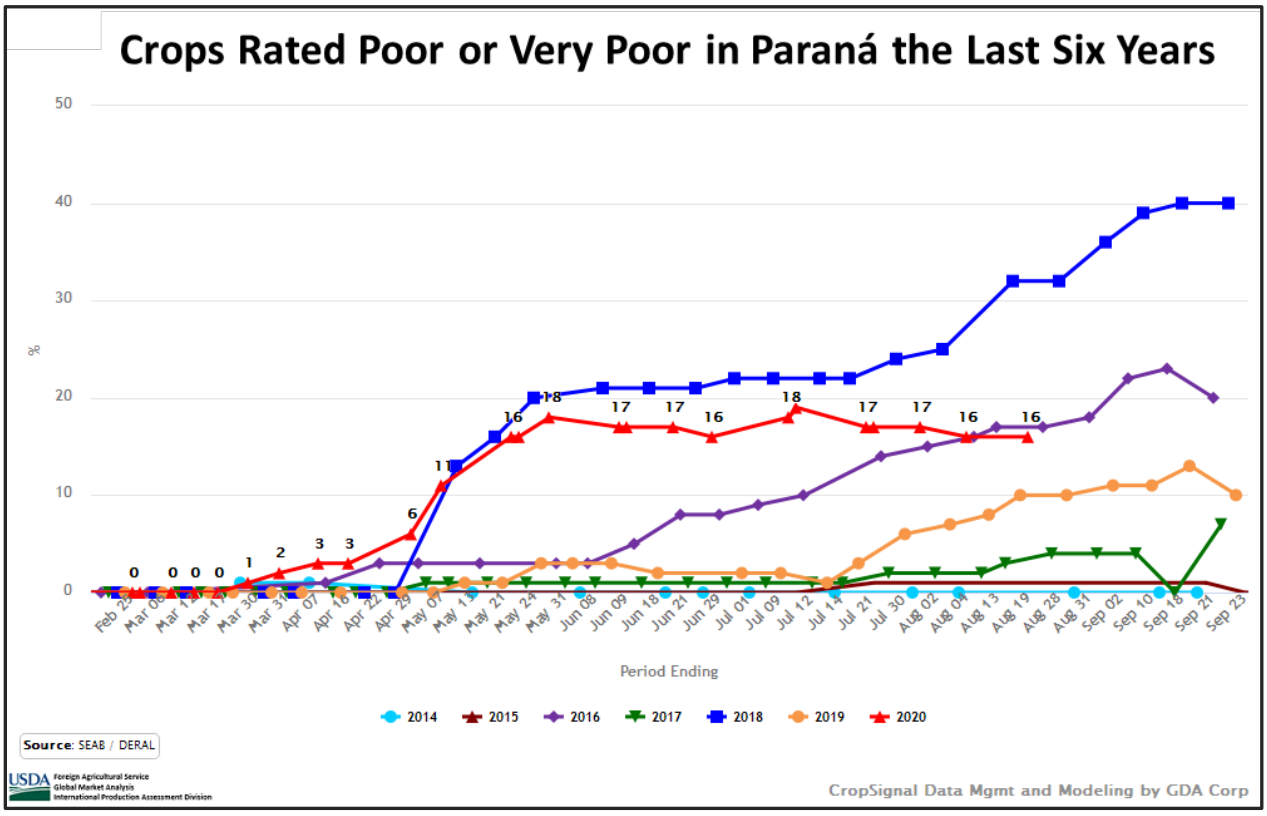

Figure 5. Comparison of crop condition rated as poor or very poor since 2014 in Paraná. The current season is the second worst in recent records. Source: SEAB/DERAL.

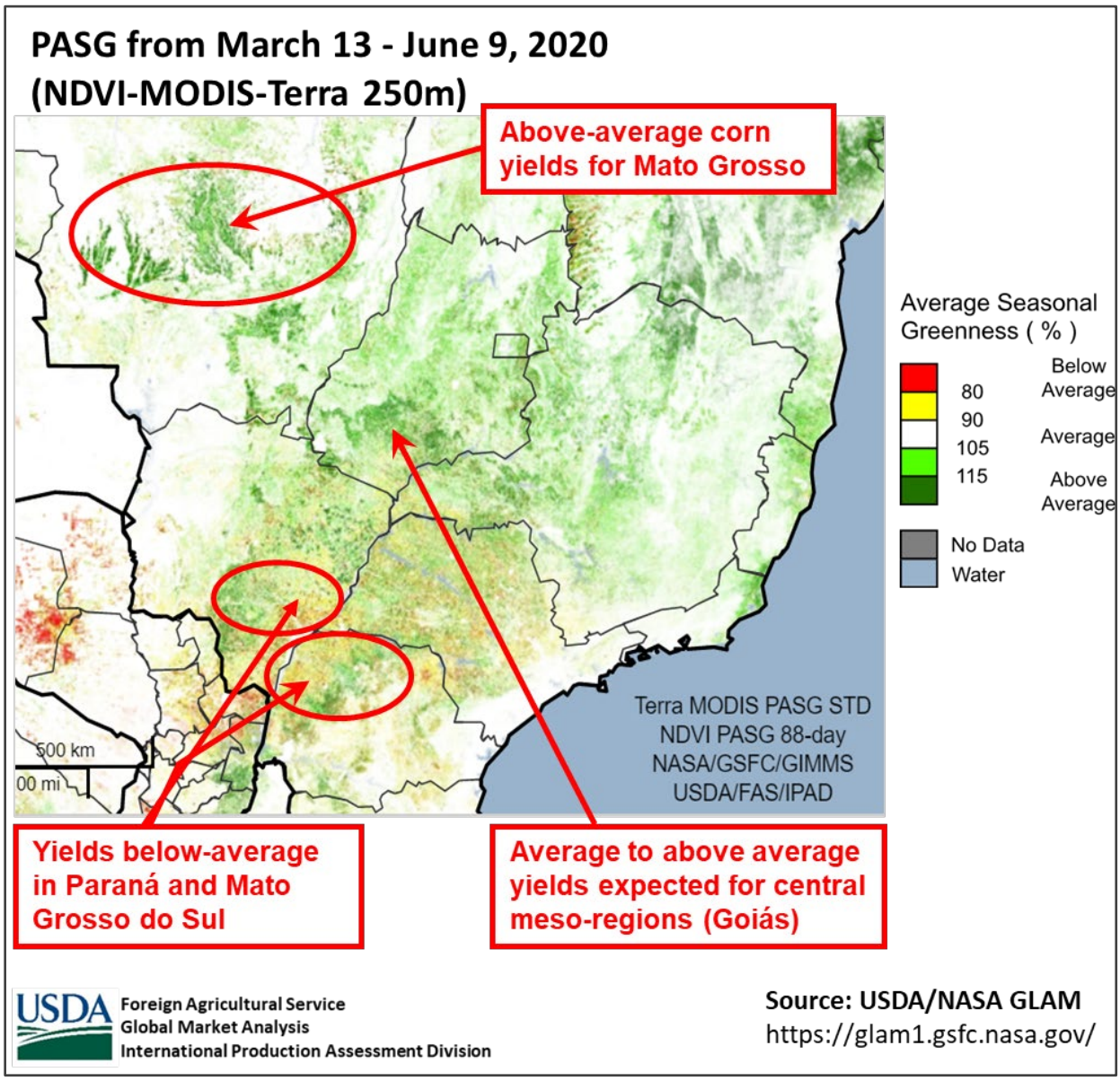

Figure 6. Percent of Average Seasonal Greeness (PASG) indicates differences in the largest *safrinha* corn producing states. While Mato Grosso and Goiás display above average crop conditions, Paraná and Mato Grosso do Sul conditions are below average. Yields are expected to be below average in the southern states but above average in Mato Grosso and Goiás. Source: NASA-USDA GLAM.

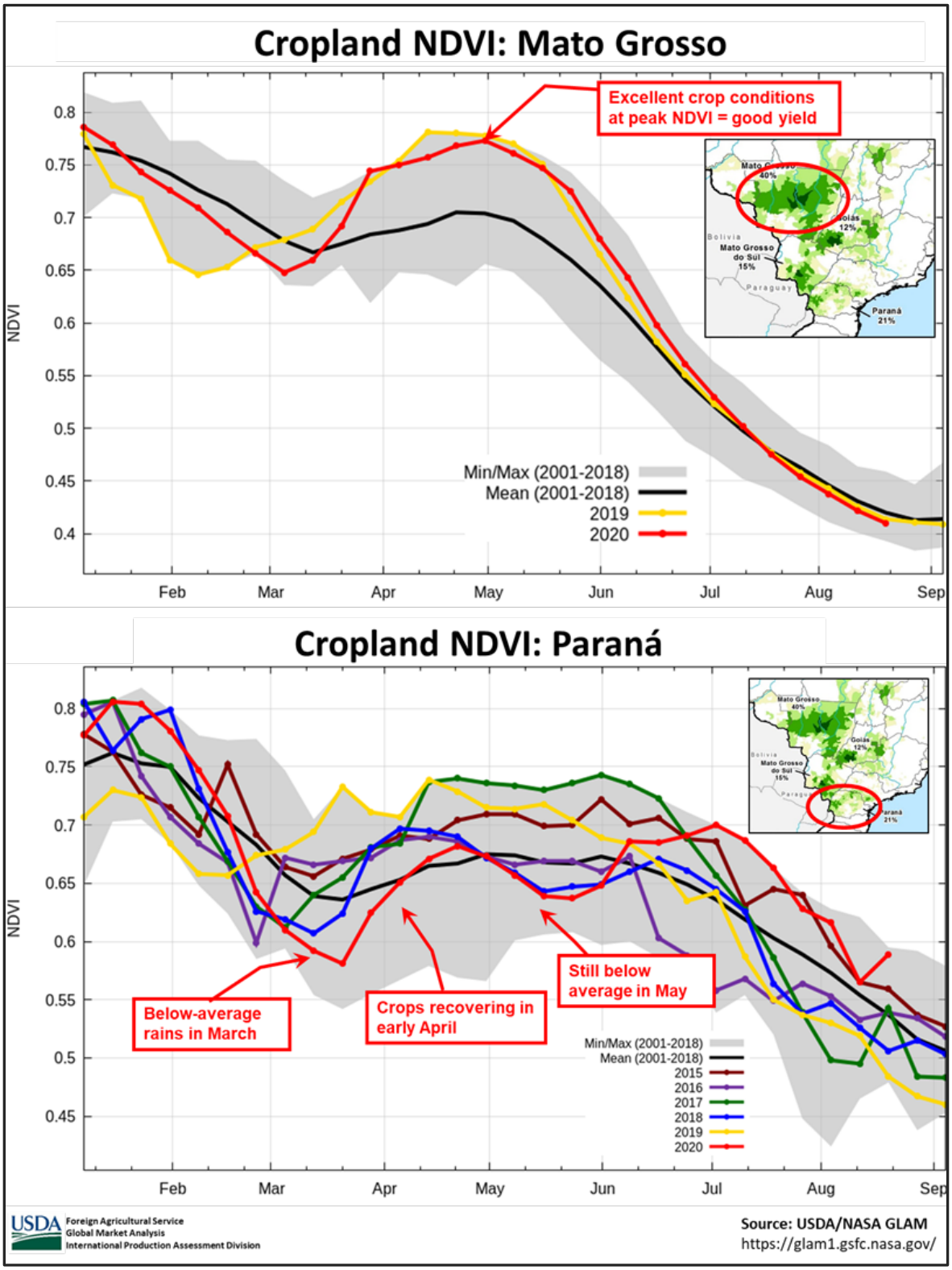

Figure 7. NDVI signatures for *safrinha* corn regions in Mato Grosso indicate a harvest similar to last year while Paraná is below the past six years for much of the second-season corn growing season. Source: NASA-USDA GLAM.

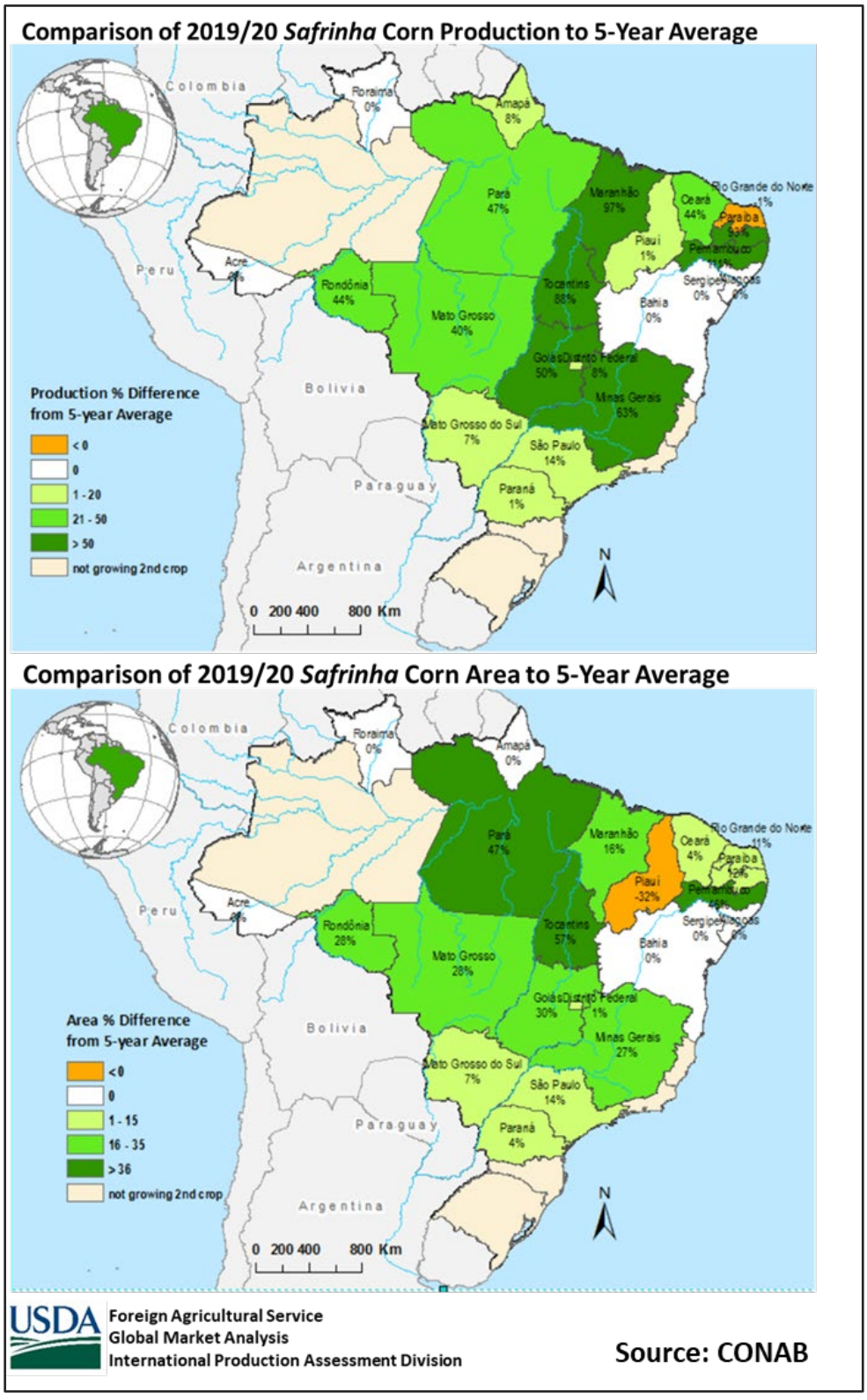

Figure 8. Percent differences in production and area for the current *safrinha* corn season compared to the 5-year average. Source: CONAB.

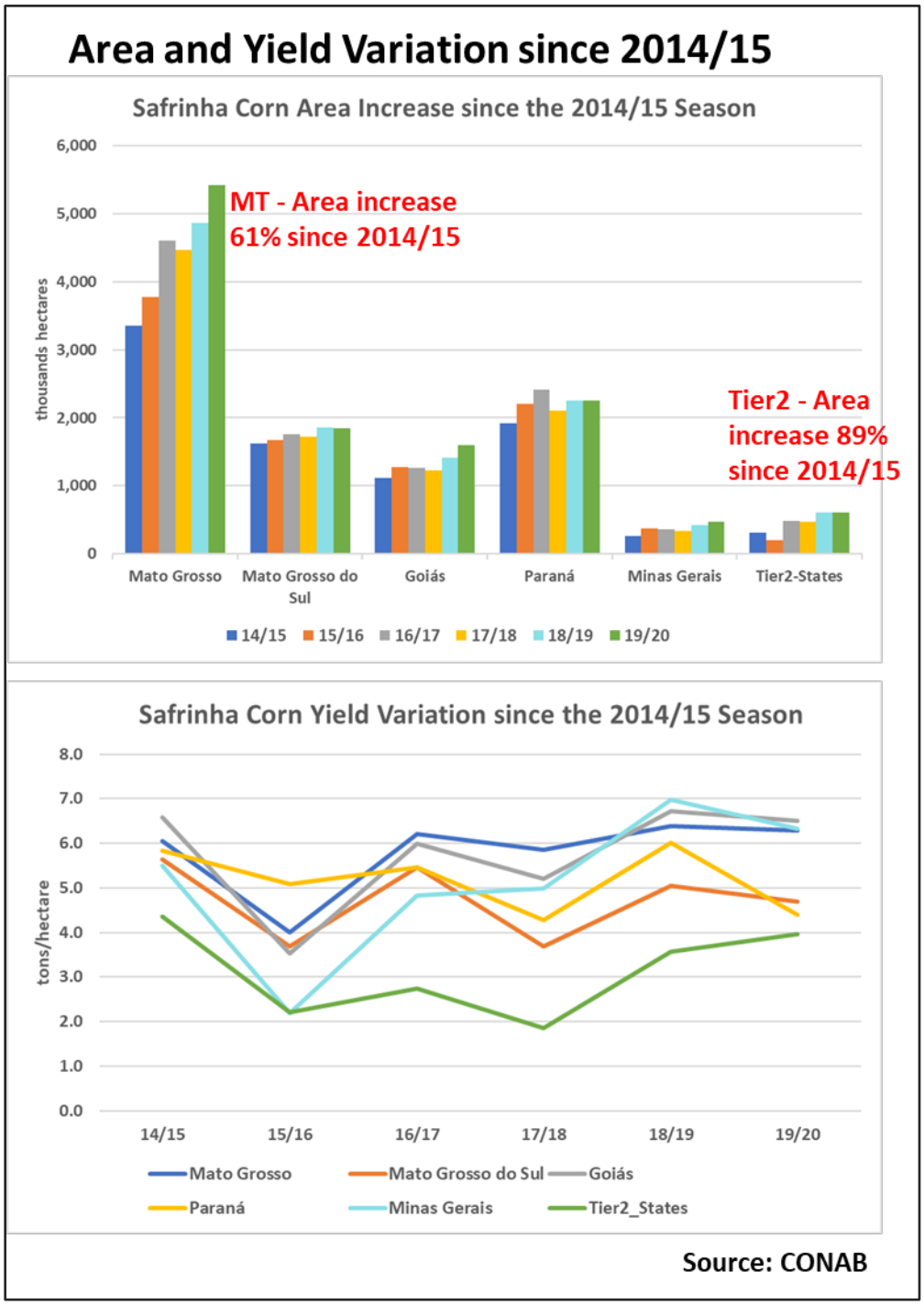

Figure 9. Area and yield variation for the top five *safrinha* corn producing states compared to the aggregated four states in the northeast (Piauí, Pernambuco, Tocantins, Maranhão). Percent of total production in 2019/20 (Mato Grosso=46%, Mato Grosso do Sul=12%, Goiás=14%, Paraná=16%, Minas Gerais=4%, Tier2-States=4%). MT=Mato Grosso. Source: CONAB.

Author contact information:

Sunita Yadav-Pauletti, Ph.D.
Sunita.Yadav-Pauletti@usda.gov

For more information and to access FAS databases and reports please visit:

Current World Agricultural Production Reports
https://www.fas.usda.gov/data/world-agricultural-production

Production, Supply and Distribution Database (PSD Online)
https://apps.fas.usda.gov/psdonline/app/index.html#/app/home

Global Agricultural Information Network (Agricultural Attaché Reports)
https://www.fas.usda.gov/databases/global-agricultural-information-network-gain

Crop Explorer
https://ipad.fas.usda.gov/cropexplorer/

Global Agricultural and Disaster Assessment System (GADAS)
https://geo.fas.usda.gov/GADAS/index.html