Commodity Intelligence Report

Russia Wheat: Record MY 2022/23 Harvest

USDA's estimate of Russia wheat production for MY 2022/23 is a record 92.0 million metric tons (mmt), up 22 percent from last year and 18 percent above the 5-year average. The estimate includes 68.0 mmt of winter wheat and 24.0 mmt of spring wheat. Total wheat yield is estimated at a record 3.17 tons per hectare (t/ha), up 17 percent from last year and 12 percent above the 5-year average. Total harvested area is estimated at 29.0 million hectares (mha), up 5 percent from last year.

USDA crop production estimates for Russia exclude estimated output from Crimea. Russia is the world's fourth largest wheat producer and accounts for almost 12 percent of global wheat production. There are significant differences between USDA and Russia's statistical agency, Rosstat, estimates of Russia's wheat production. This article provides background on the approximately 11-million-ton difference. USDA continues to evaluate the data to understand the differences in estimates.

Winter wheat, on average, accounts for about 70 percent of total wheat production in Russia. The bulk of the winter crop is grown in four districts predominantly located in European Russia: the Southern, the Central, the Volga, and the North Caucasus District (Figure 1). Spring wheat, which accounts for the remaining 30 percent is mostly planted in Siberia, Urals, and Volga (Figure 2). Harvest of the marketing year (MY) 2022/23 wheat crop is complete.

This marketing year, Rosstat published three reports that included the agency's numbers for 2022. Unlike the first release from late-December 2022, which had only national-level estimates, the second and third reports from mid-January 2023 and mid-March 2023, respectively, provided district- and oblast-level data. According to Rosstat, reports do not reflect the Ukrainian oblasts occupied by Russia.

Official Russian numbers include Crimea. USDA excludes Crimea from the Russian estimates and adds it to Ukraine; the Rosstat numbers discussed below were recomputed to account for this regional adjustment. Rosstat's MY2022/23 wheat production is 103.0 mmt (excluding Crimea). This amount is 21 percent above the 2017 record. The agency estimates total wheat yield at 3.55 t/ha (excluding Crimea), which is 14 percent higher relative to the 2017 record of 3.11 mt/ha. Rosstat's estimates track the overall numbers included in the Russian Ministry of Agriculture (MinAg) operational weekly harvest reports.

Seasonal Weather Outlook:

Wheat grown in Russia is generally rain-fed. Autumn precipitation was favorable for winter wheat planting and establishment. Winter wheat went into dormancy under favorable conditions and remained dormant into March. Overall, this season's weather conditions for winter wheat were favorable, but not perfect as precipitation remained below average across key winter wheat growing oblasts (Figure 3). Timely rainfall events, however, brought adequate soil moisture necessary to keep the vegetation status about average. Across the spring wheat growing districts, weather was overall favorable with timely precipitation, except for Siberia, which suffered some mid-season dryness resulting in below-average vegetation conditions in mid-August. As a result, locally dry conditions developed across the Siberia District. Rainfall across the Urals and the Central Forest regions was significantly better than last season. July, however, which is the key month for spring wheat, featured drier weather in the west.

Area:

Analysis of the sub-regional Rosstat data indicates the reported district-level area changes are within the range of the historical time series (Figures 4 and 5). The officially published Rosstat data show around 0.5 percent abandonment this season, which is the lowest on record (Figure 6). Furthermore, the spring wheat growing region has experienced overall favorable weather, which supports the low abandonment rate this season.

During the season, USDA's harvested area is informed by Rosstat's planted area statistics, which are typically published mid-summer. USDA adjusts the official Rosstat number for winter kill and spring abandonment to get an estimate of harvested area, where the corresponding percentages are based on past-year rates. Spring abandonment of winter wheat is generally low. Spring wheat abandonment, however, varies as seen in Figure 6. During the last few years, spring wheat abandonment has been decreasing but overall has stayed around or above 2 percent.

USDA's area harvested estimates for winter and spring wheat are 16.3 mha and 12.7 mha, respectively. This is in line with Rossat's suggested area numbers for this season's crop.

Yield:

Rosstat's district-level yield data are summarized in Figures 7 and 8. Time series analysis shows record winter and spring harvests across all major wheat producing regions, except for the winter crop in the North Caucasus District and the spring crop in the Central District; these two districts account for 13 percent of winter and 14 percent of spring wheat production, respectively. Official data suggest much higher yield

increase for the spring crop (27 percent relative to the previous record) as compared to the winter crop (7 percent relative to the previous record). Spring wheat, however, is generally the lower yielding crop with an average yield of 1.81 mt/ha, whereas the winter wheat average yield is 3.66 mt/ha; both yield numbers represent the 5-year 2017-2021 average.
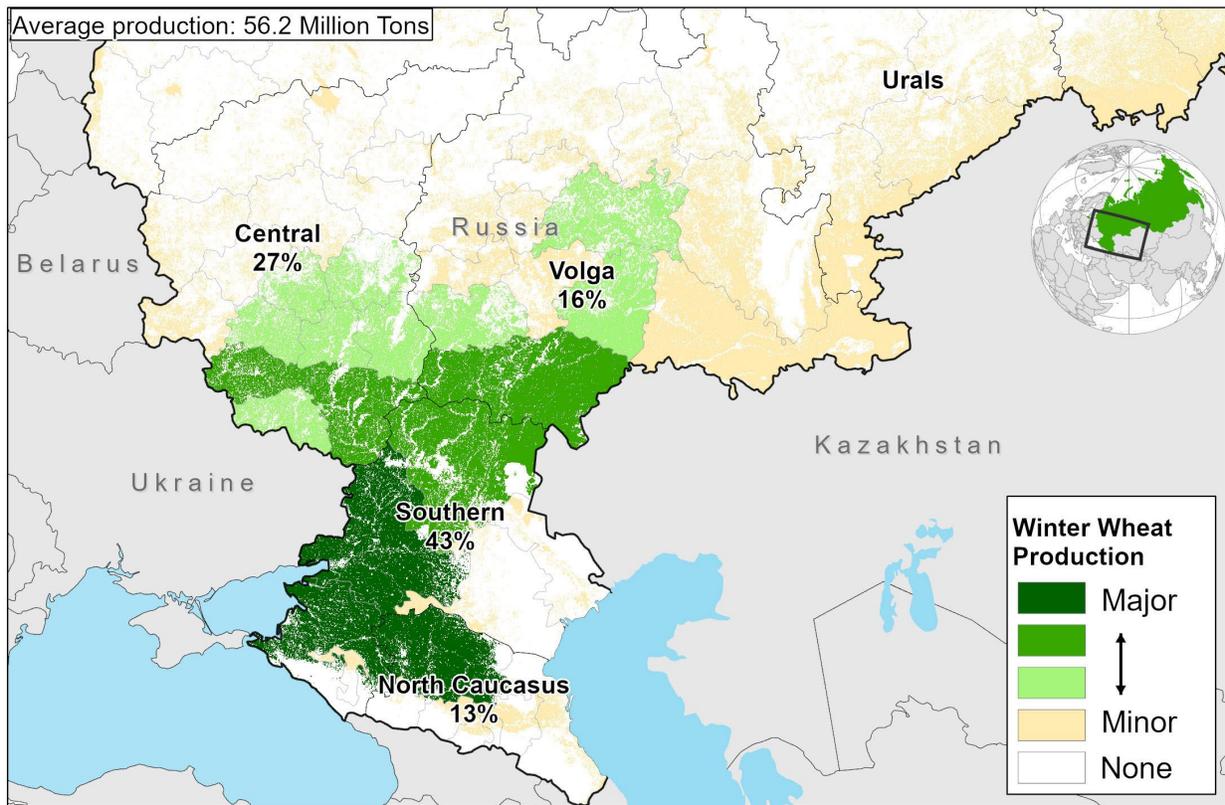
USDA reviews vegetation responses for specific regions and uses crop masks to focus on land that has typically been cropped. The Normalized Difference Vegetation Index (NDVI) provides information about the crop conditions during the season, allowing a comparison to past seasons. Each set of graphs displayed in Figures 9 and 10 show multi-year NDVI time series for the major winter and spring wheat growing districts, respectively. Two major observations can be made: first, this season's vegetation status was around the average across all districts for both crops, and second, in many instances the 2022 NDVI curves tracked below the 2017 record year. Additional regression-based yield modeling, which incorporates weather information (i.e., precipitation and temperature), crop status (i.e., Vegetation Health Information, VHI) and crop stage development (i.e., cumulative growing degree day information, which allows to determine the key yield formation stages) also suggests good to near-record but not exceptional yield prospects.

USDA estimates Russia wheat yield at 3.17 t/ha (calculated on a per harvested basis and excluding production from Crimea), up 2 percent relative to the 2017 record and 12 percent relative to the 5-year average. Rosstat's high wheat yield estimate results in a production estimate 11 million tons above USDA's wheat estimate, up 14 percent relative to the 2017 record and 24 percent relative to the 5-year average.

Summary:

In conclusion, this season's weather was overall favorable, but there were enough incursions of dryness to raise concerns (Figures 11 and 12). Despite the promising NDVI and VHI responses at key yield formation stages, such as flowering and filling, neither remote sensing nor regression-based yield modeling indicates a yield substantially above the previous record set in 2017.

RUSSIA: Winter Wheat Production

Average production: 56.2 Million Tons

Urals

Russia

Central
27%

Volga
16%

Belarus

Ukraine

Kazakhstan

Southern
43%

North Caucasus
13%

Winter Wheat Production

Major

Minor

None

USDA **Foreign Agricultural Service**
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Data Source: Rosstat, Average Crop Production 2017-2021;
GFSAD 30 m crop cover (2015)

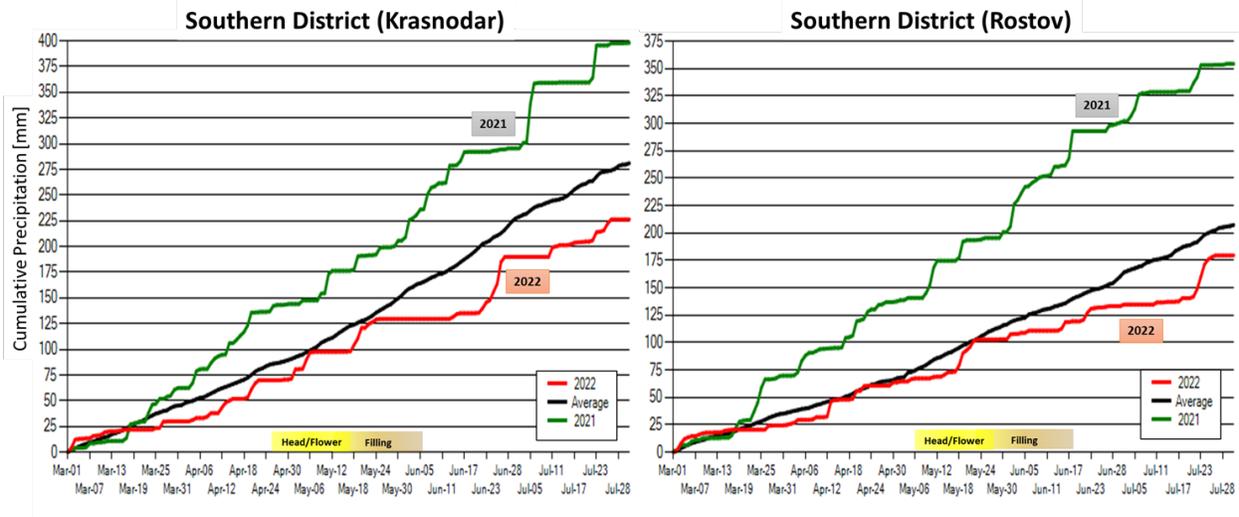Figure 1. Russia winter wheat production. Source: Rosstat.

RUSSIA: Spring Wheat Production

Average production:22.0 Million Tons

Belarus

Ukraine

Central
14%

Northwest

Volga
25%

Russia

Southern
1%

North
Caucasus

Urals
15%

Siberia
42%

Kazakhstan

Mongolia

**Spring Wheat
Production**

Major

Minor

None

USDA **Foreign Agricultural Service**
U.S. DEPARTMENT OF AGRICULTURE

Data Source: Rosstat, Average Crop Production 2017-2021;
GFSAD 30 m crop cover (2015)

Figure 2. Russia spring wheat production. Source: Rosstat.

Figure 3. Cumulative precipitation across the Southern District in Russia, which is a key winter wheat growing district accounting for 43 percent of production. Source: WMO.
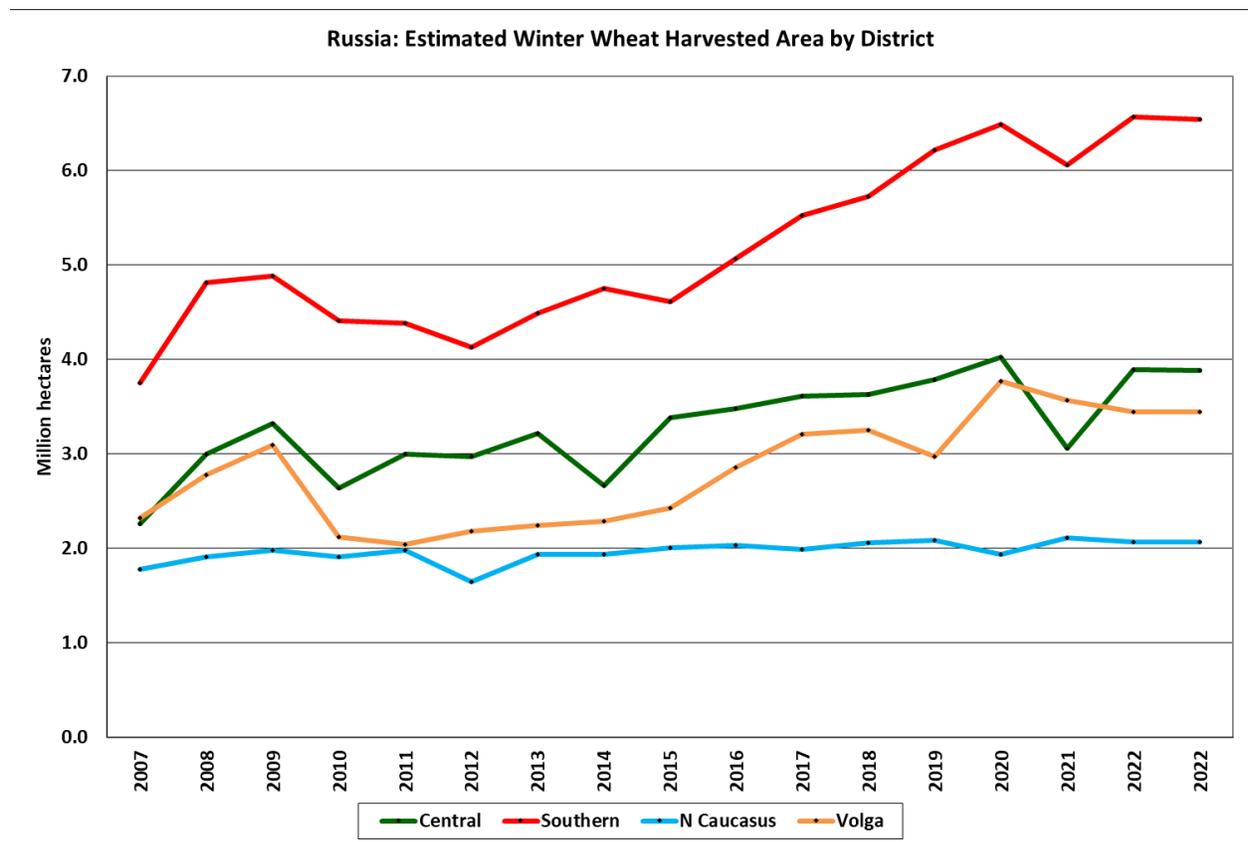
Figure 4. Russia wheat: estimated harvested area by district of winter wheat. Source: Rosstat.
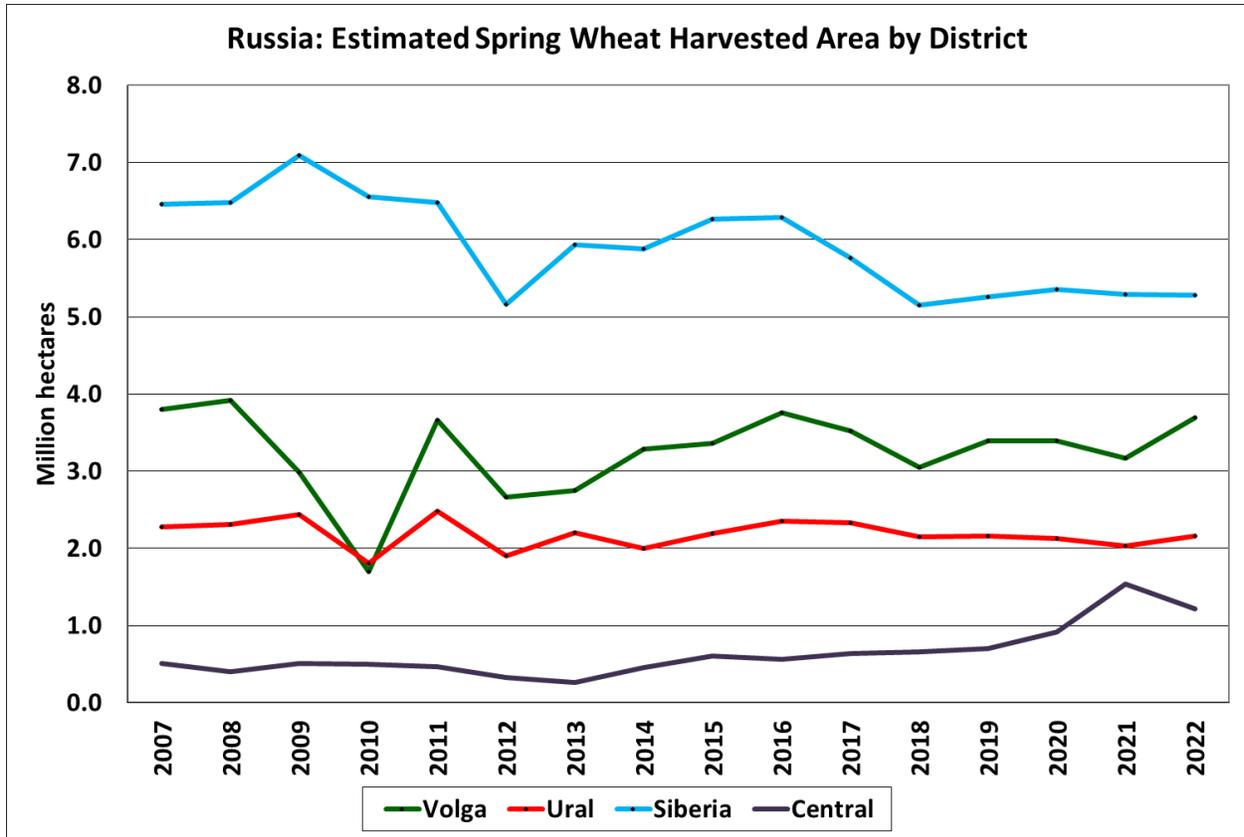
Russia: Estimated Spring Wheat Harvested Area by District

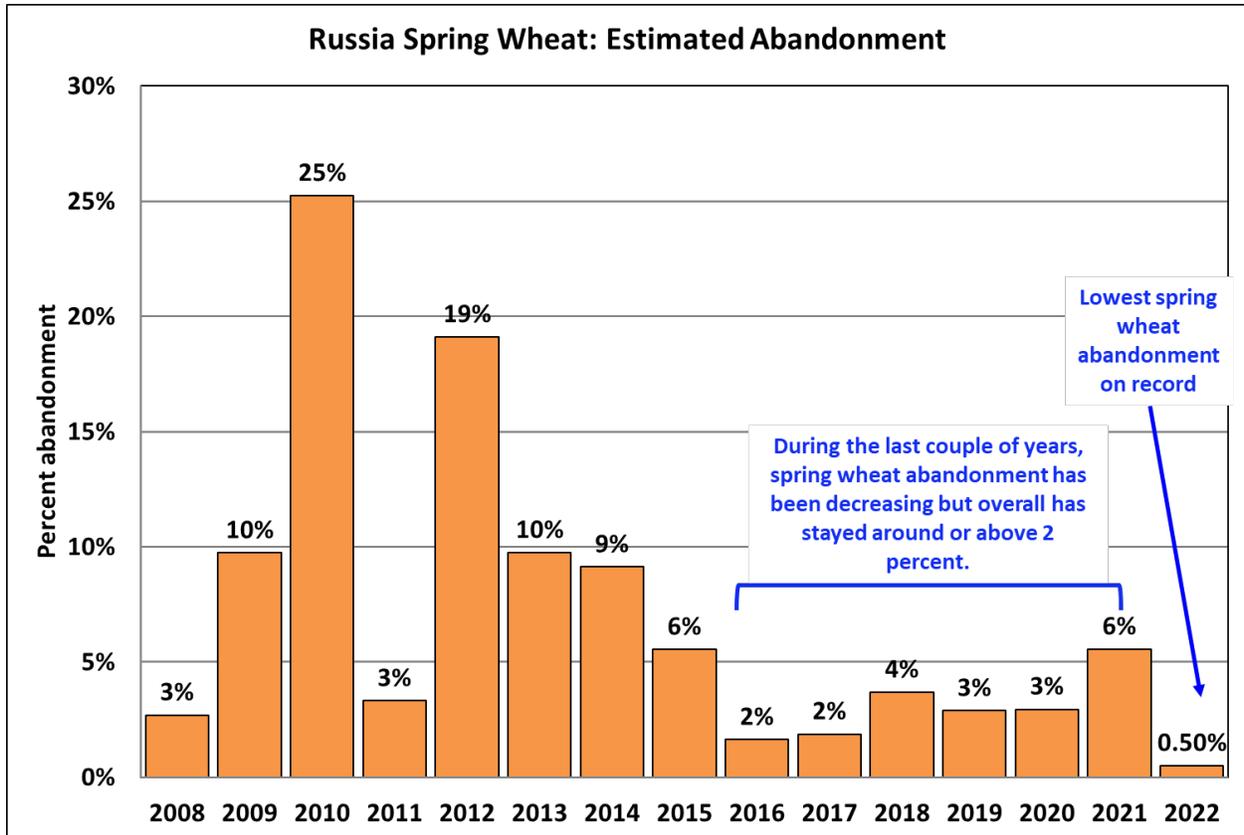Figure 5. Russia wheat: estimated harvested area by district of spring wheat. Source: Rosstat.

Figure 6. Russia spring wheat: estimated abandonment. Source: Rosstat.
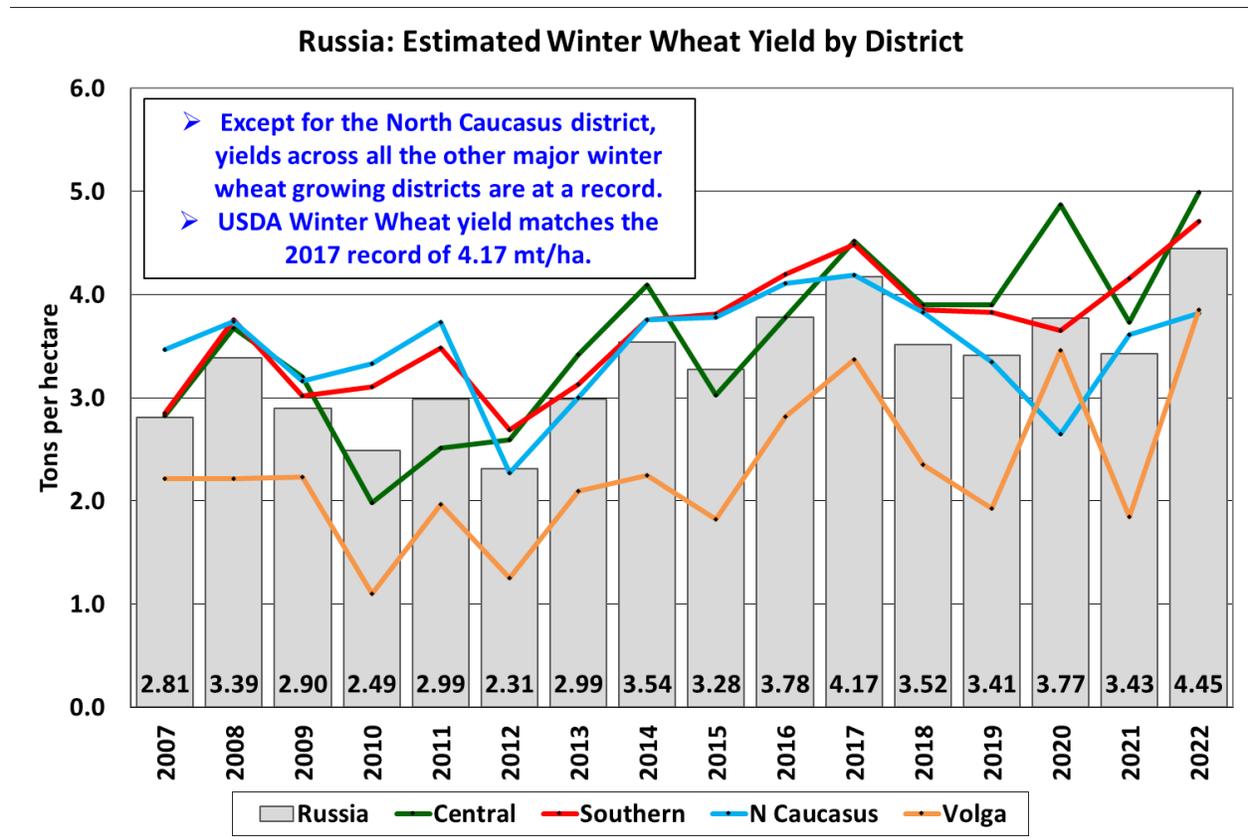
Figure 7. Russia: estimated winter wheat yield per district. Source: Rosstat (2022 preliminary).
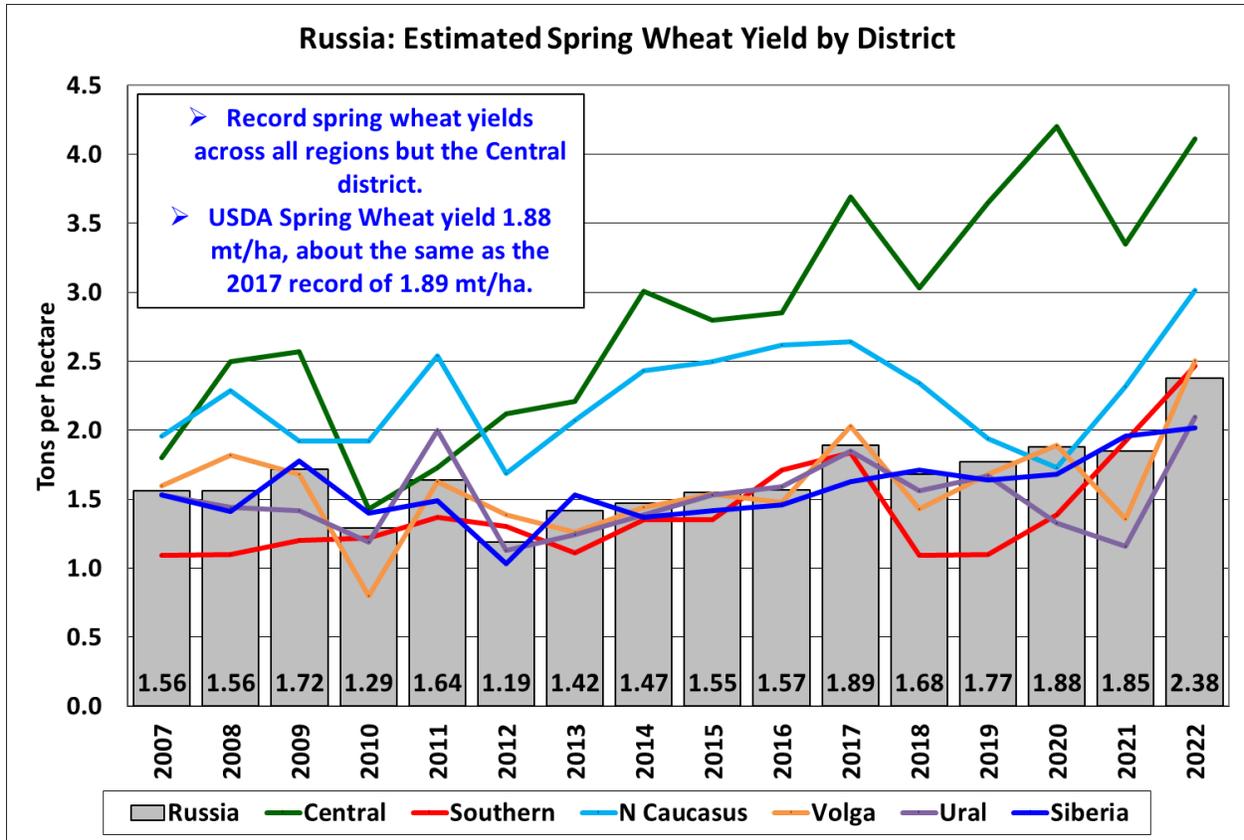
Figure 8. Russia: estimated spring wheat yield per district. Source: Rosstat (2022 preliminary).
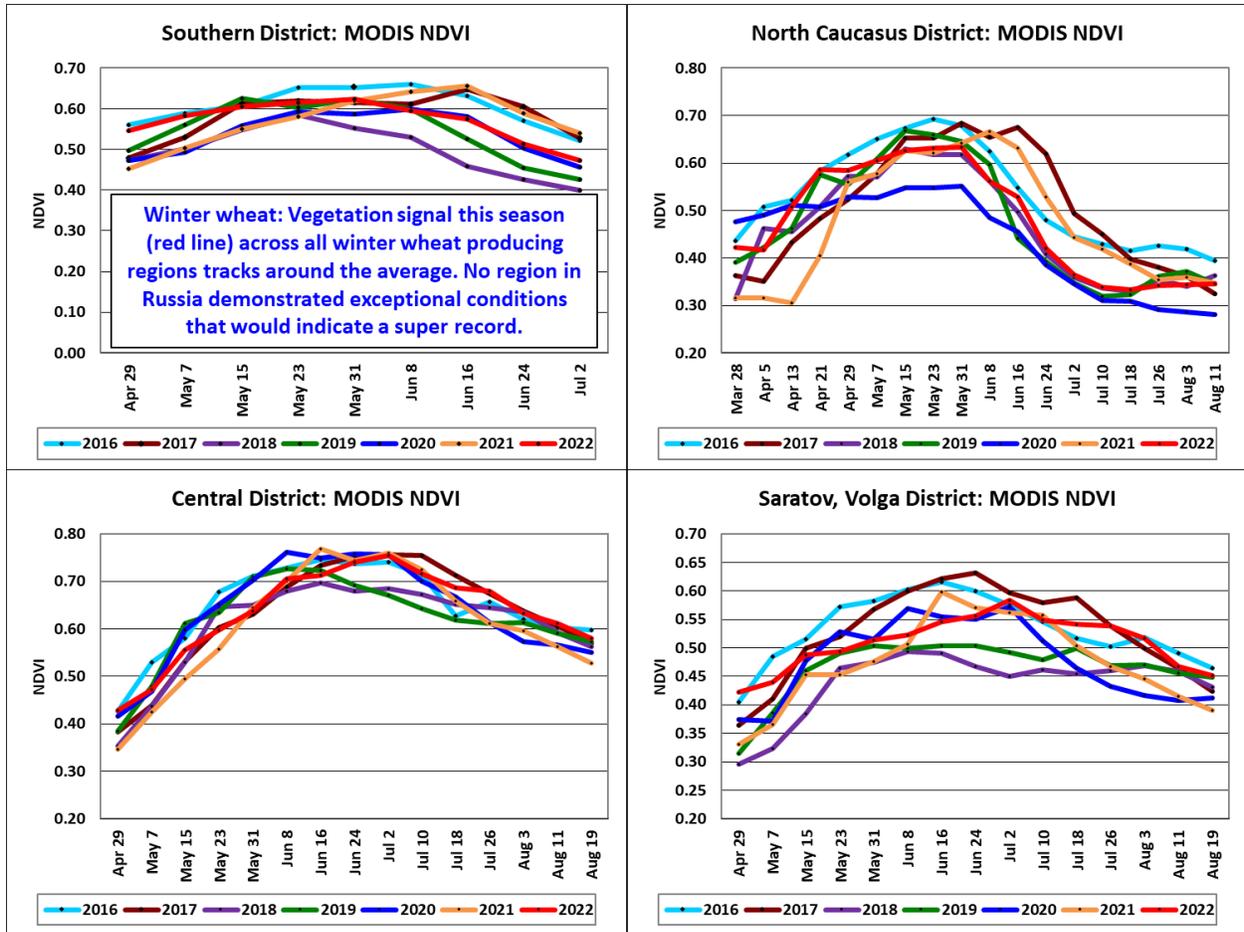
Figure 9. Russia: MODIS 8-day NDVI time series across all major winter wheat producing districts.
Source: USDA/NASA Global Agricultural Monitoring (GLAM), MODIS 8-day NDVI; crop mask GFSAD30-CE 2015 Crops.
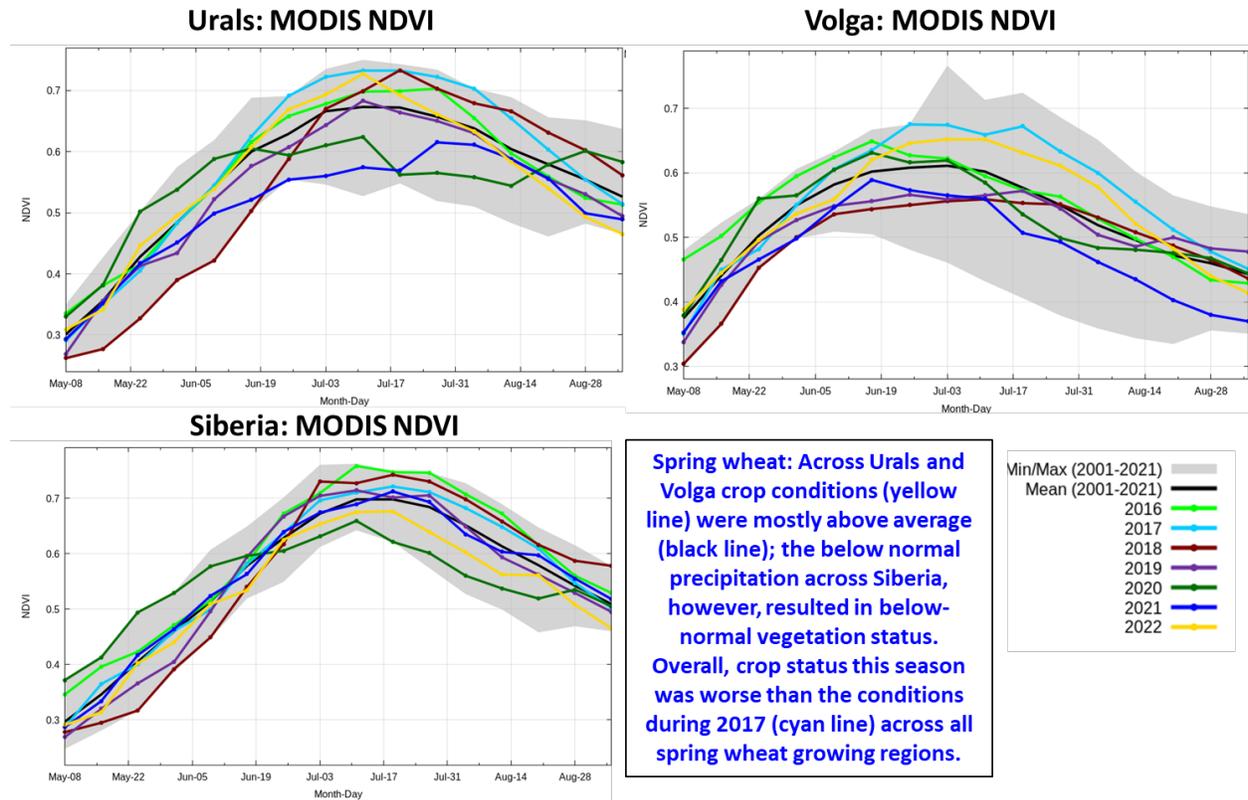
Urals: MODIS NDVI

Volga: MODIS NDVI

Siberia: MODIS NDVI

Spring wheat: Across Urals and Volga crop conditions (yellow line) were mostly above average (black line); the below normal precipitation across Siberia, however, resulted in below-normal vegetation status. Overall, crop status this season was worse than the conditions during 2017 (cyan line) across all spring wheat growing regions.

Min/Max (2001-2021)
Mean (2001-2021)
2016
2017
2018
2019
2020
2021
2022

Figure 10. Russia: MODIS 8-day NDVI time series across all major spring wheat producing districts. Source: USDA/NASA Global Agricultural Monitoring (GLAM), MODIS 8-day NDVI; crop mask GFSAD30-CE 2015 Crops.
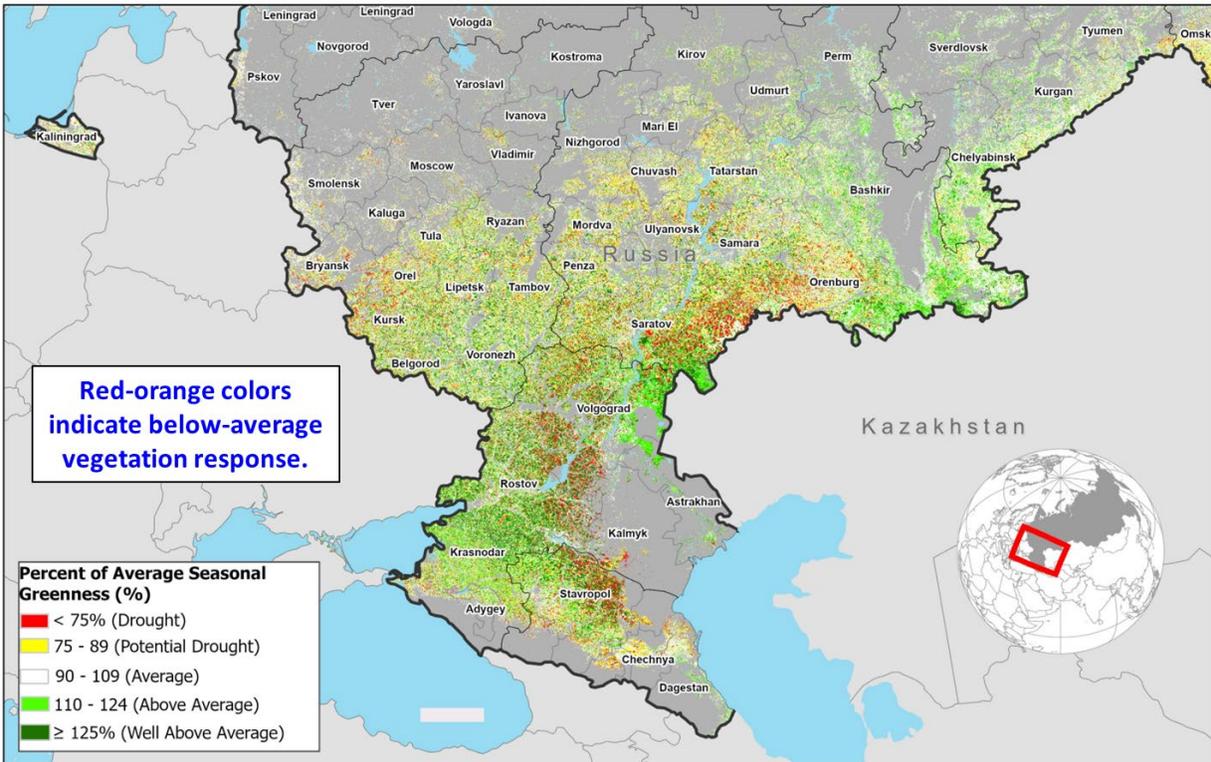
Figure 11. Russia: Percent of Average Seasonal Greenness (PASG) over the major winter wheat growing districts. Source: USDA/NASA Global Agricultural Monitoring (GLAM), MODIS; crop mask GFSAD30-CE 2015 Crops.

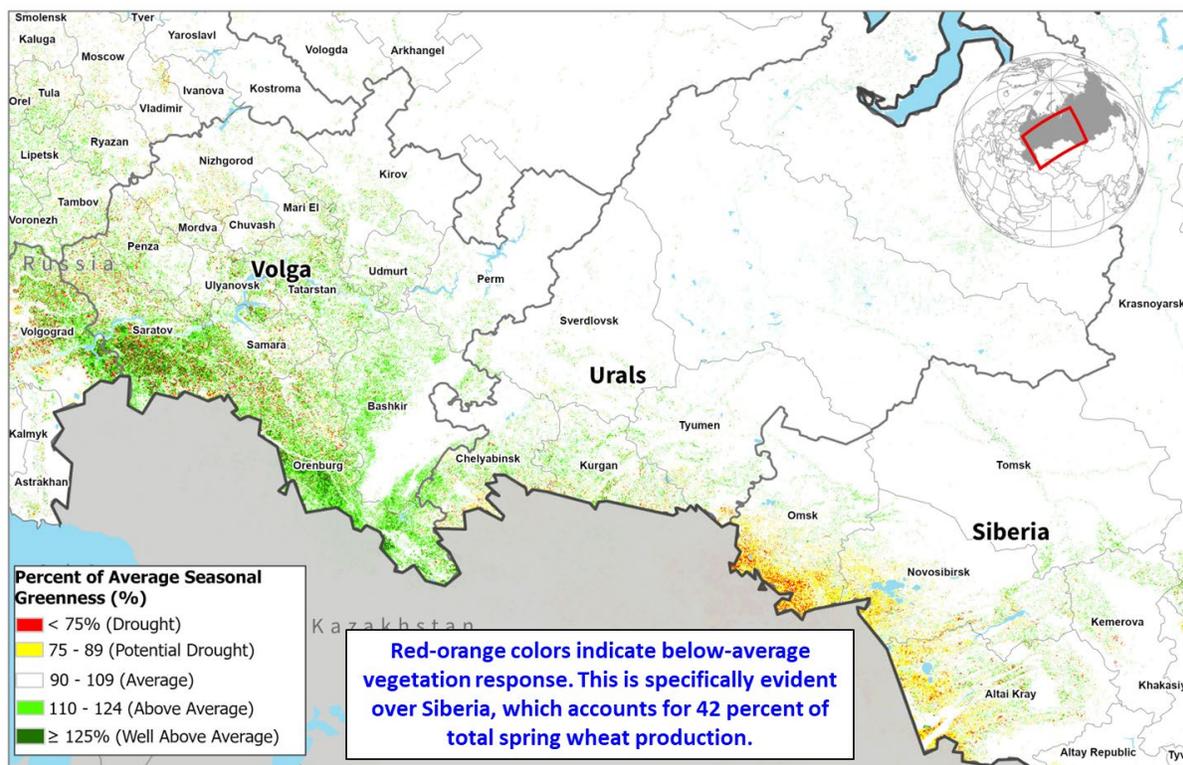## Russia Percent of Average Seasonal Greenness (May 17 - August 12, 2022)

Figure 12. Russia: Percent of Average Seasonal Greenness (PASG) over the major spring wheat growing districts. Source: USDA/NASA Global Agricultural Monitoring (GLAM), MODIS; crop mask GFSAD30-CE 2015 Crops.

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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