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U.S. DEPARTMENT OF AGRICULTURE

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Global Market Analysis
International Production Assessment Division
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March 22, 2024

Commodity Intelligence Report

Middle East Wheat Prospects are Positive for MY 2024/25 on Abundant Precipitation

Prospects for wheat in the Middle East are favorable entering the spring of 2024. Fall and winter precipitation replenished soil moisture and improved water stores for irrigation, and early signals suggest an above-average harvest could be on the horizon.

The Middle East accounts for roughly 5 percent of global production of wheat, with about 97 percent of the region's wheat grown in four countries: Turkey (45 percent), Iran (35 percent), Iraq (11 percent), and Syria (6 percent) (see figure 1). Most of the wheat grown in the Middle East is winter wheat, with planting in the northern hemisphere fall, and harvest in the spring and summer. The region receives most of its annual rainfall between November and April. Last season, however, wheat in the Middle East emerged from dormancy on the heels of a historic drought, particularly in Turkey, which was deeply established by the fall planting season of 2022, continuing through the winter of 2023. Fortunately for grain farmers, conditions rebounded as rains arrived in the spring of 2023, leading to above-average wheat production in marketing year (MY) 2023/24, including a record crop in Turkey. This positive momentum continued during fall planting for the upcoming season (MY 2024/25), as rainfall kept soil moisture stores abundant in most of the major cropping areas of the region (see figure 2). This greatly benefited crop establishment prior to winter dormancy for most of the Middle East wheat crop. By November, soil moisture was at or above normal across most of the four major producing countries of the region (see figure 2).

Abundant precipitation continued over winter, first in northern stretches of the region in January, and then in February towards the south (see figure 3). Cumulative precipitation in key grain areas of Turkey, Iraq, and Syria are at or above normal (see figures 4, 5, 8, 9, and 11). Rainfall in northern Iraq, where most of the country's water storage infrastructure lies, has been especially beneficial in replenishing water stores for the upcoming season, following historically low water levels in many of its reservoirs last year. In response, winter planting has expanded three-fold in Iraq, according to recent reporting from government and industry sources.

Areas receiving below-normal precipitation in January and February had mostly been in Iran, however these regions have also received high amounts of rainfall more recently. Figure 6 highlights several key grain growing areas in the country (see figure 10 for a map), three of which were below normal for precipitation through February. Importantly, however, irrigation supplies most of the water needed for wheat in these areas experiencing drier conditions. This applies to Hamadan, Khuzestan, and Fars, as indicated in figure 6. Rainfed wheat primarily lies in northwest Iran, represented in figure 6 by East Azarbaijan, where precipitation has been above normal this season.

One factor of modest concern at these early stages is the prevalence of relatively high temperatures. Above-normal temperatures have been widespread throughout the region over the winter (see figure 7), leading crops to break dormancy early. Generally, throughout the region crops entered dormancy later than usual and emerged from dormancy earlier than is typical. This will likely not impact yields if temperatures remain elevated. However, there is an increased risk of yield losses if a hard spring freeze occurs, since plants lose their cold hardiness once dormancy is broken.

Analysis of vegetation health early in the season is more appropriately limited to the southern areas of the region, where crops are in late vegetative to reproductive stages. This includes the region historically known as the Fertile Crescent. Satellite-derived MODIS Normalized Difference Vegetation Index (NDVI) analysis of crops in the Fertile Crescent indicates crop conditions well above average (see figure 12). Subnational NDVI analysis, specifically in the high grain-producing regions of Southeast Anatolia, Turkey (see figure 13), Golestan, Iran (see figure 14), Al Hasakah, Syria (see figure 15), and Nineveh, Iraq (see figure 16) shows crop conditions well above average. In Khuzestan, Iran, where rainfall had been notably below normal in January and February (see figure 6), NDVI analysis shows the vegetation health of crops above last year, and far above the 24-year normal (see figure 17). This highlights the impact of both recent heavy rains and irrigation for crops in this area. Finally, a look at crops in several key areas through satellite imagery indicates vegetation health exceeding last year at early stages of the season (see figures 18, 19, and 20).

A considerable amount of time remains before harvest commences, beginning in May in Iraq, and June or July for most of the remainder of the Middle East. However, prospects remain promising for wheat farmers in the region, should conditions hold throughout the spring.

Percent of Middle East Wheat Production, by Country

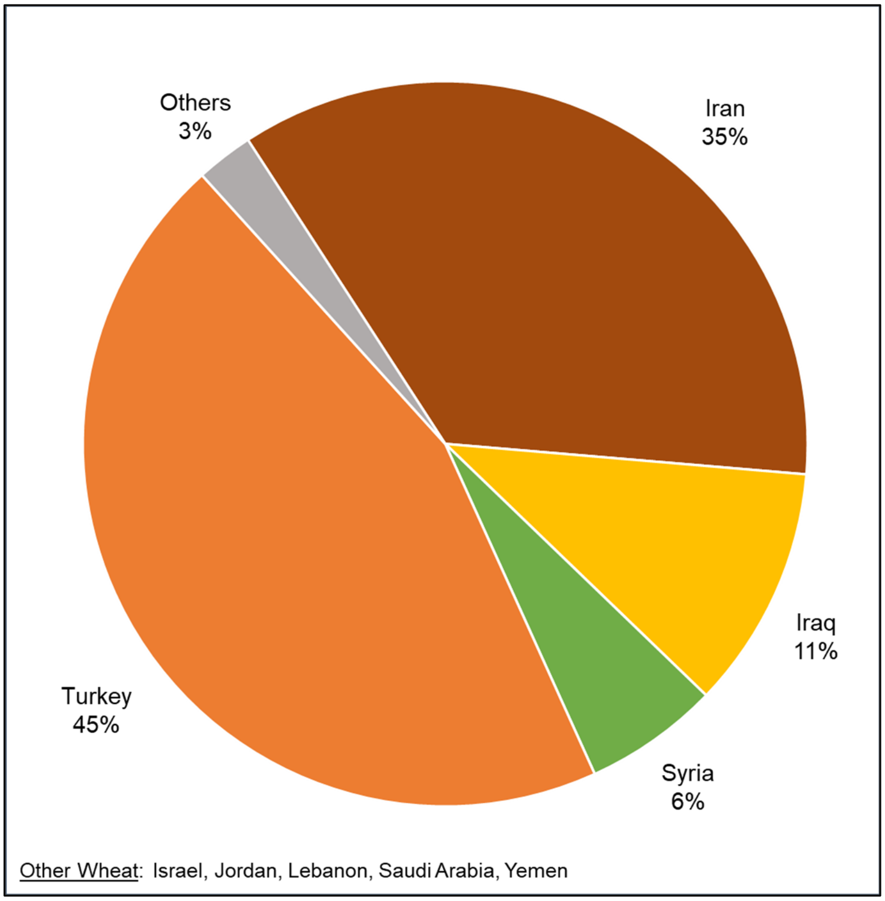

Figure 1. The proportion of wheat grown in the Middle East region, by country, based on the 5-year average (marketing years 2018/19 through 2022/23). Source: USDA PSD Online

Middle East: Soil Moisture Departure from Normal

September, October, and November 2023

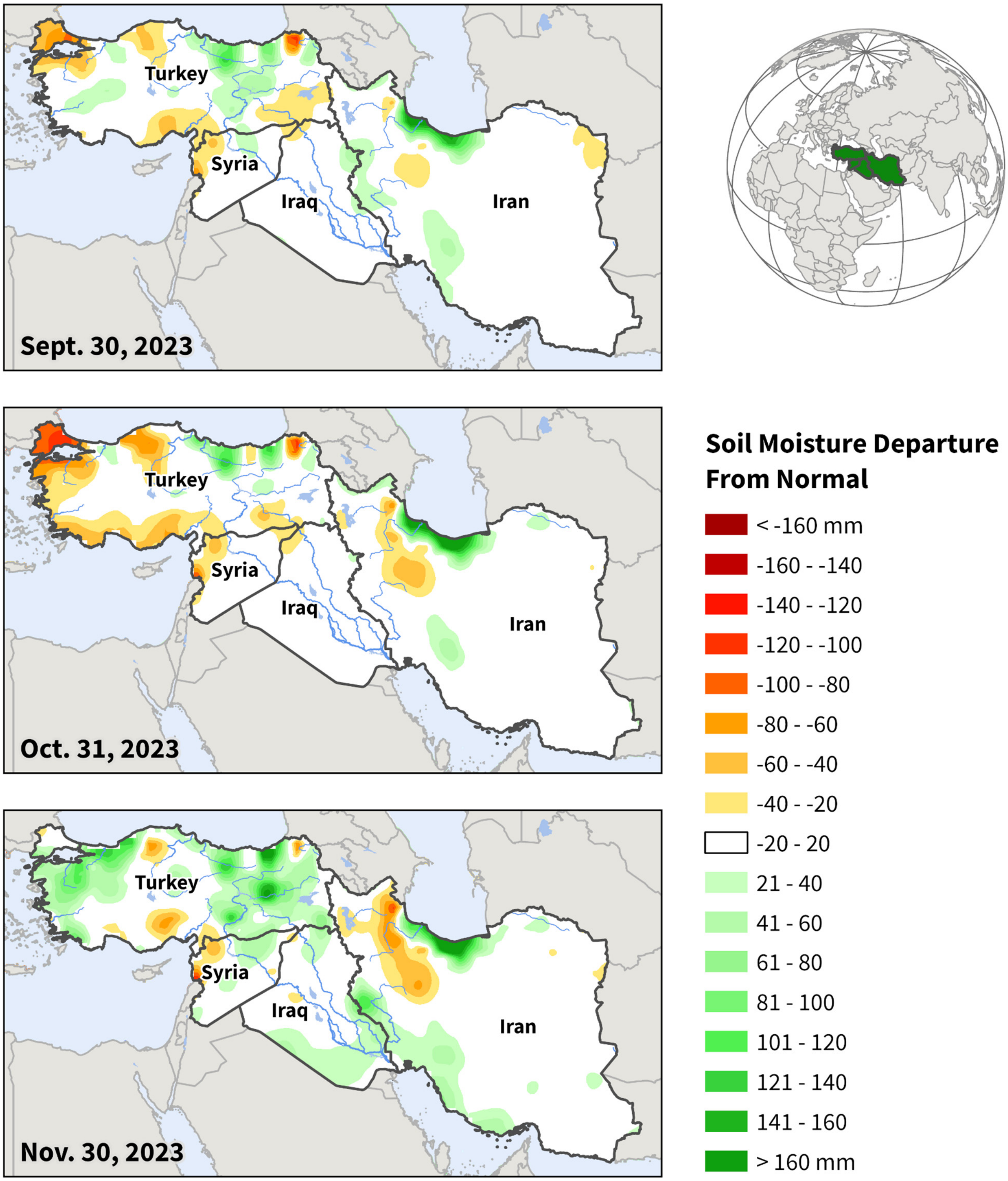

Figure 2. Abundant soil moisture was prevalent during the fall 2023 planting season, aiding crop establishment. Source: NOAA CPC Soil Moisture Data

Middle East: Cumulative Precipitation Percent of Normal

January and February 2024

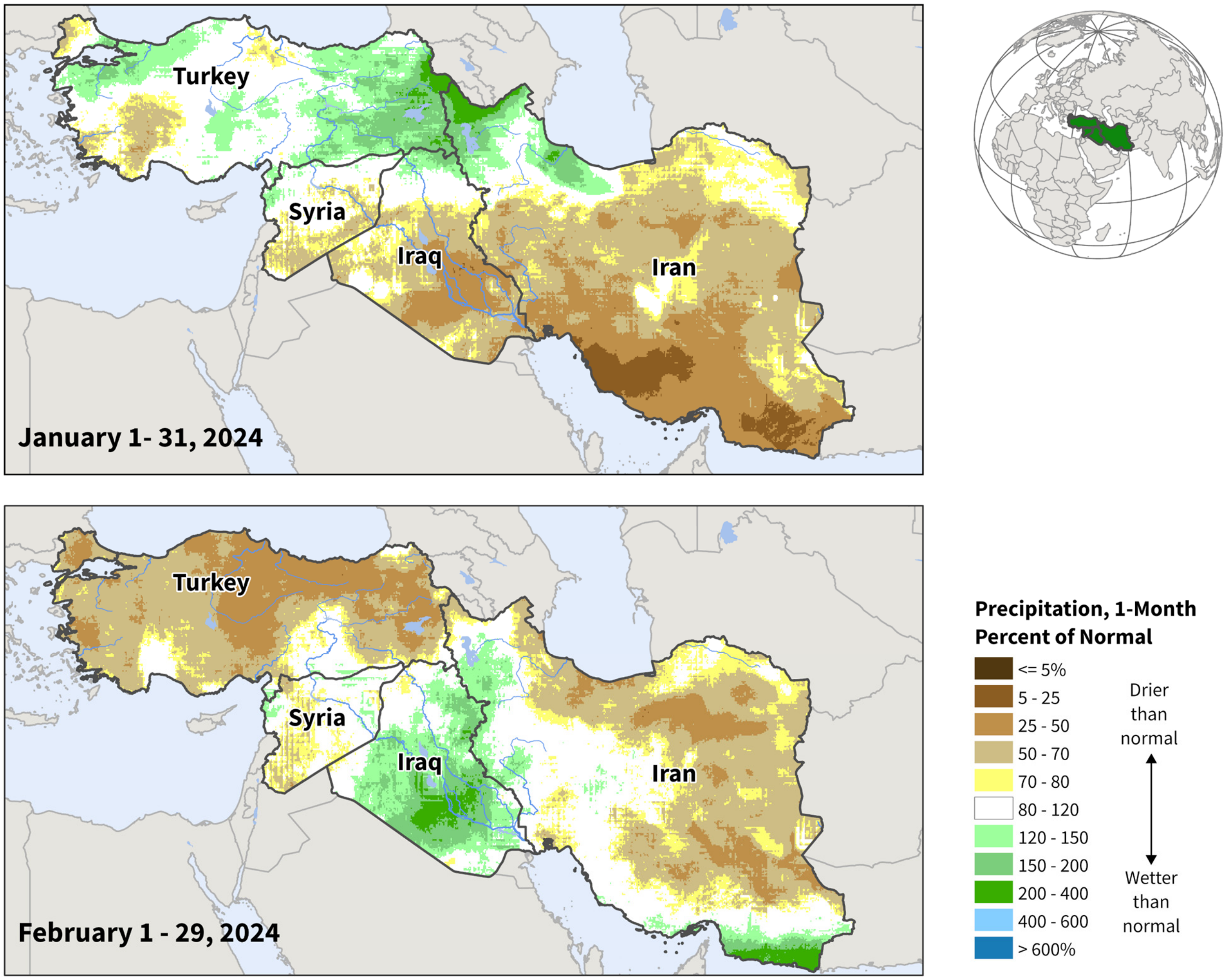

Figure 3. Mid-winter precipitation was variable, but precipitation was generally abundant in either January or February, in most areas of the region, except for eastern and southwestern Iran, where wheat is primarily irrigated. Source: UCSB CHIRPS Cumulative Precipitation Percent of Normal, 1-Month

Cumulative Precipitation in Key Grain Areas of Turkey

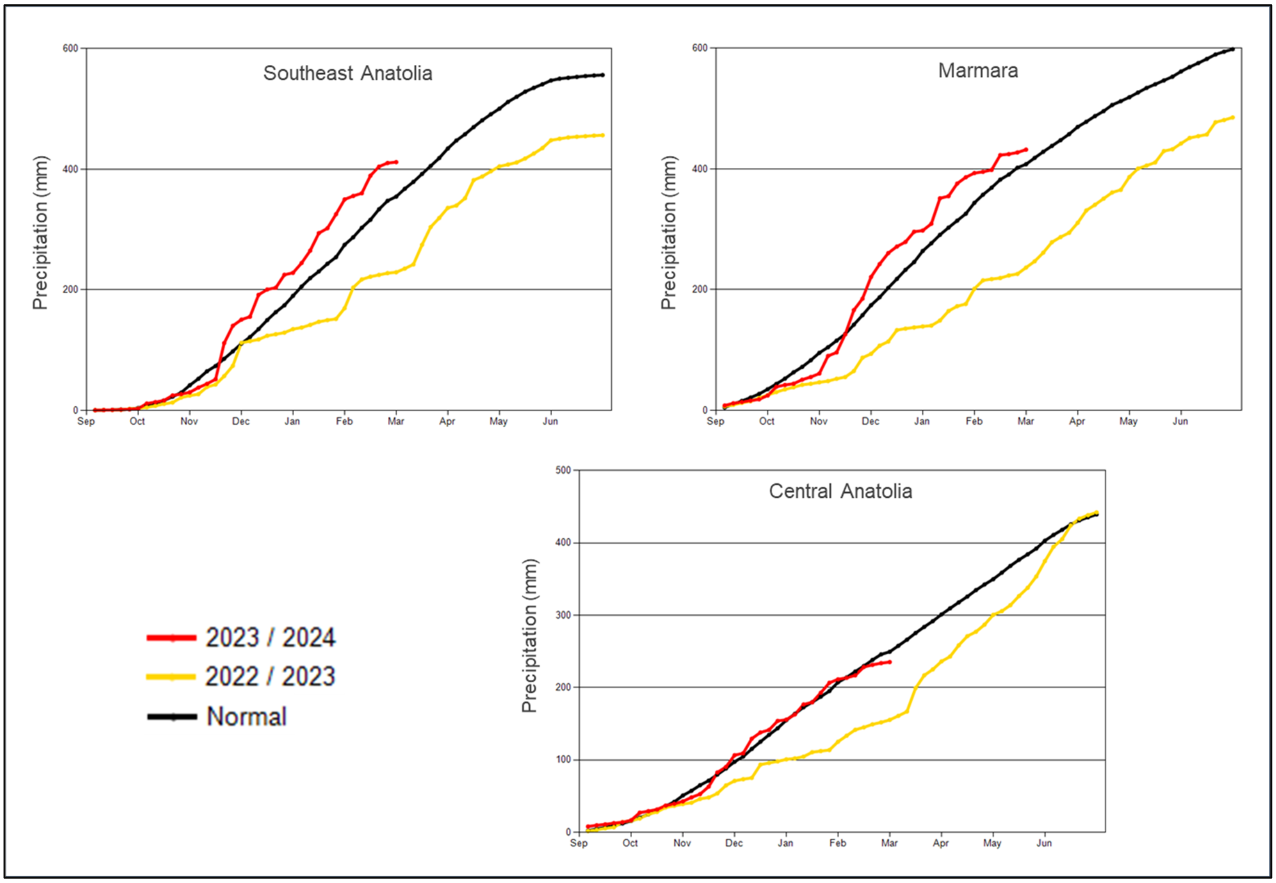

Figure 4. Above-normal precipitation occurred in key grain areas of Turkey. Sources: USCB CHIRPS; IIASA Cropland 2005 Crop Mask

Cumulative Precipitation in Key Grain Areas of Iraq and Syria

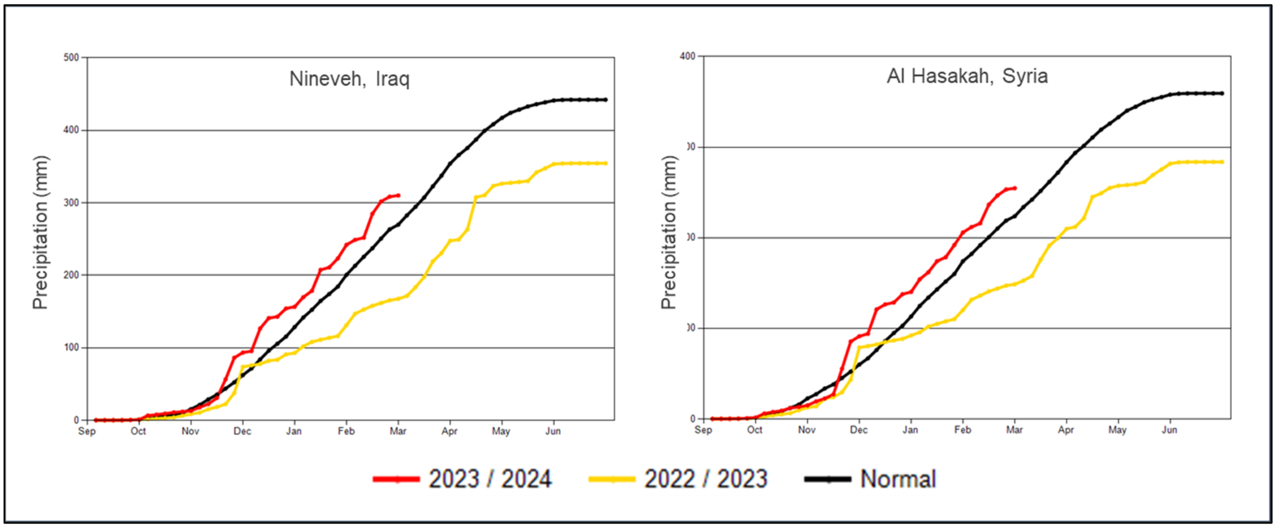

Figure 5. Above-normal precipitation occurred in key grain areas of Iraq and Syria. Sources: USCB CHIRPS; IIASA Cropland 2005 Crop Mask

Cumulative Precipitation in Key Grain Areas of Iran

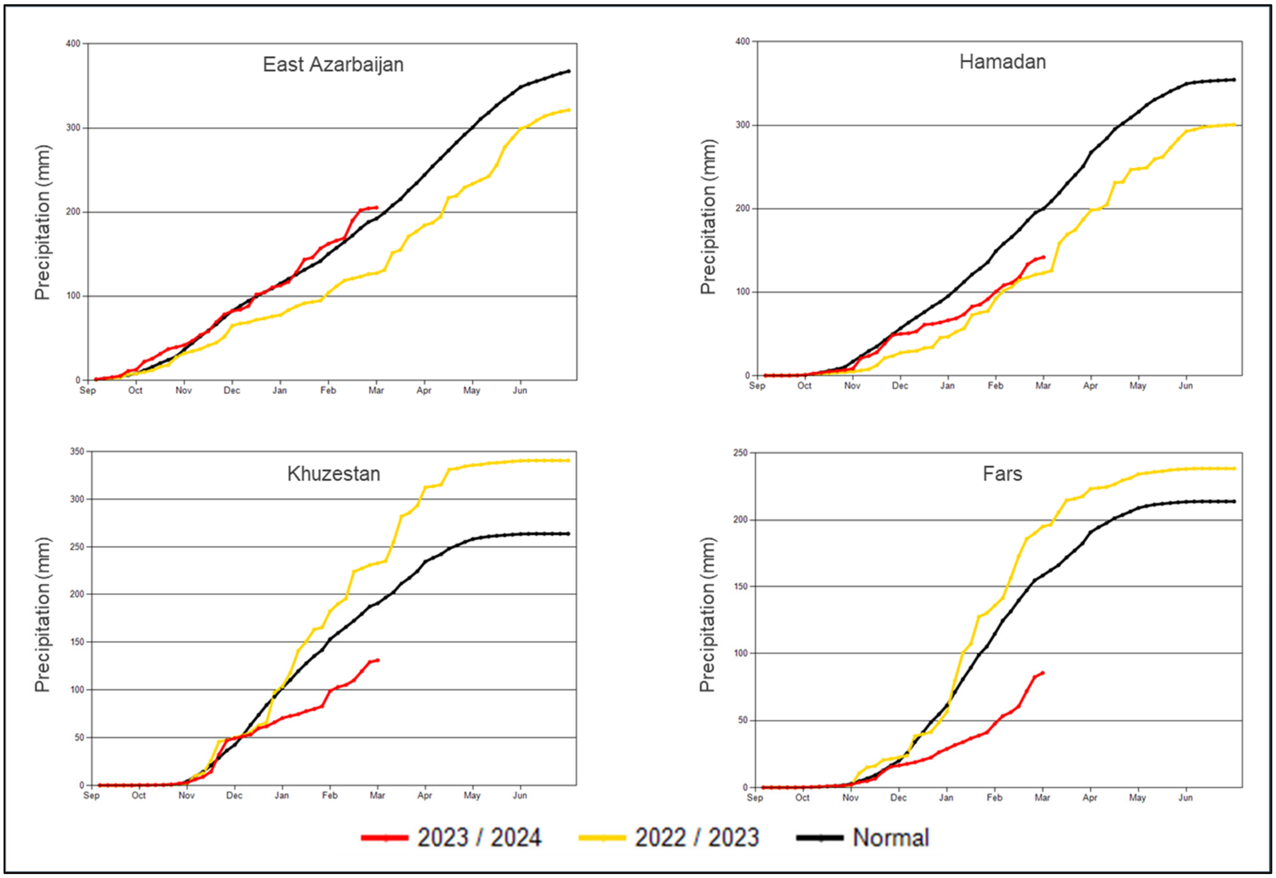

Figure 6. Above-average precipitation was received in East Azarbaijan, where wheat is mostly rainfed. Below-normal precipitation occurred in several key grain areas of Iran in January and February; however, wheat is primarily irrigated in the regions of Hamadan, Khuzestan, and Fars. More recent heavy rains not accounted for in the graphs shown here have begun to offset these early season deficits. Sources: USCB CHIRPS; IIASA Cropland 2005 Crop Mask

Middle East: Average Temperature and Temperature Departure from Normal

January and February 2024

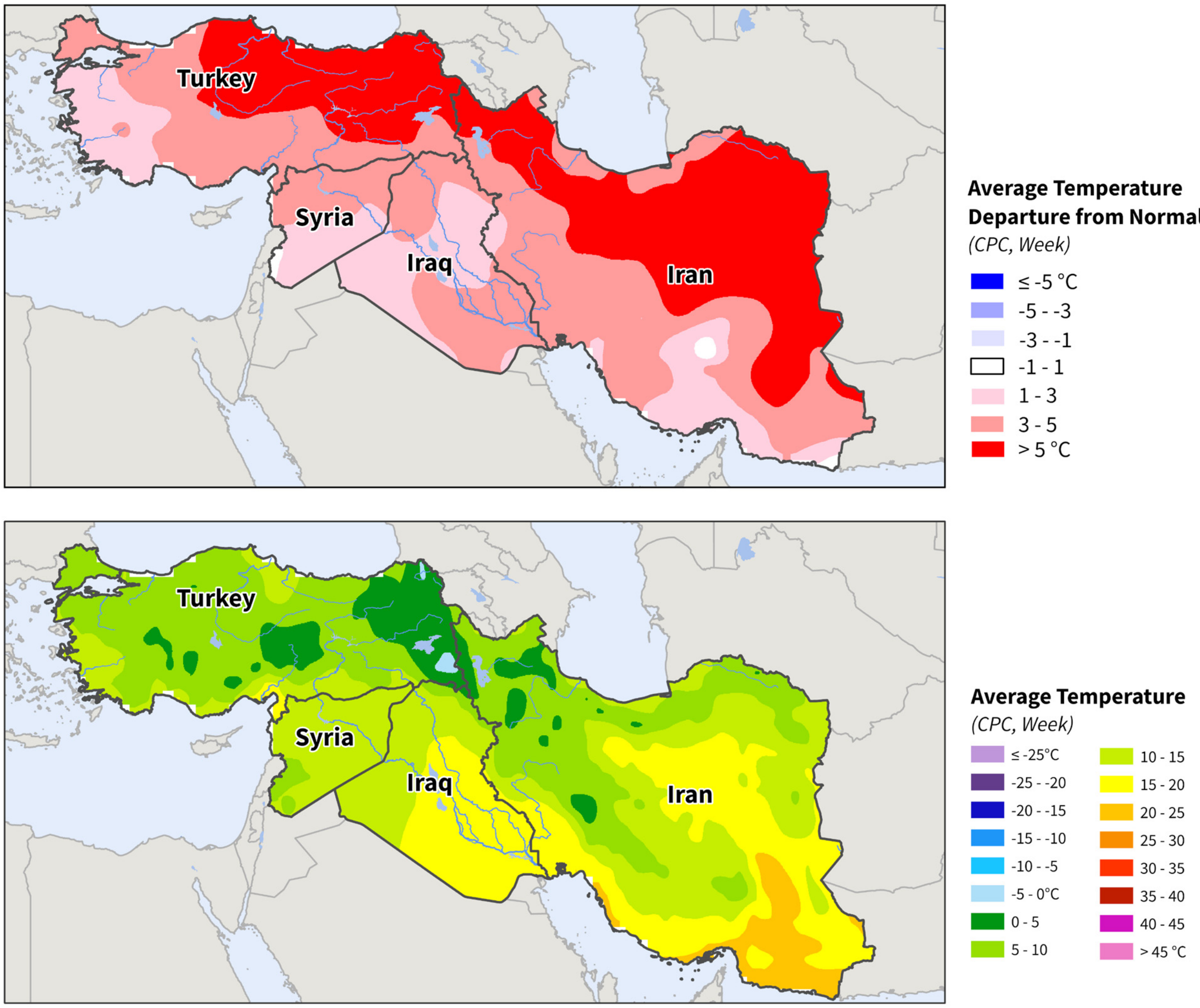

Figure 7. Above-normal temperatures were observed throughout the region over winter, which shortened the dormancy period in most areas for winter grains. Source: NOAA CPC Average Temperature and Average Temperature Departure from Normal, 7-Day

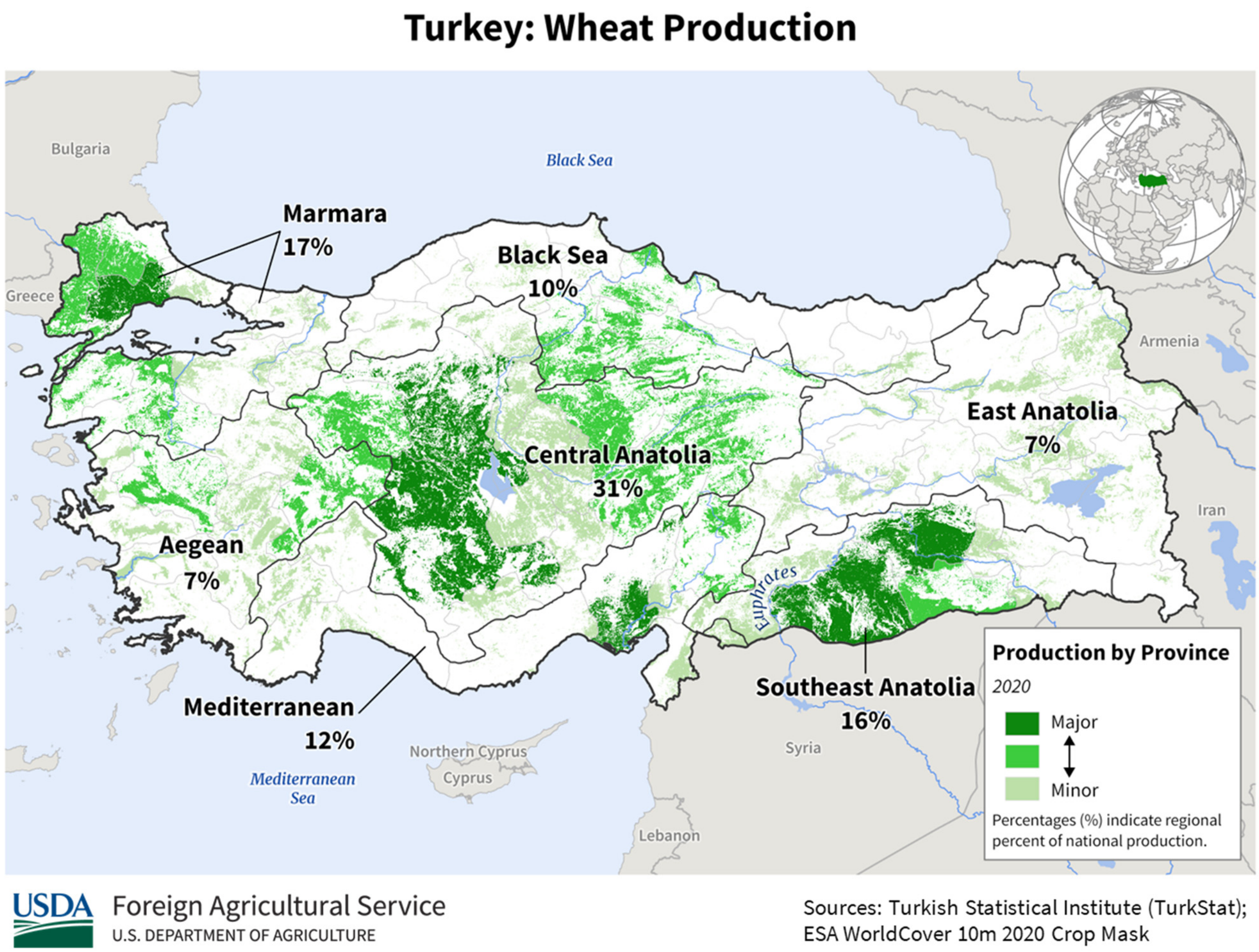

Figure 8. The spatial distribution of wheat production in Turkey. Sources: Turkish Statistical Institute (TurkStat); ESA WorldCover 10m 2020 Crop Mask

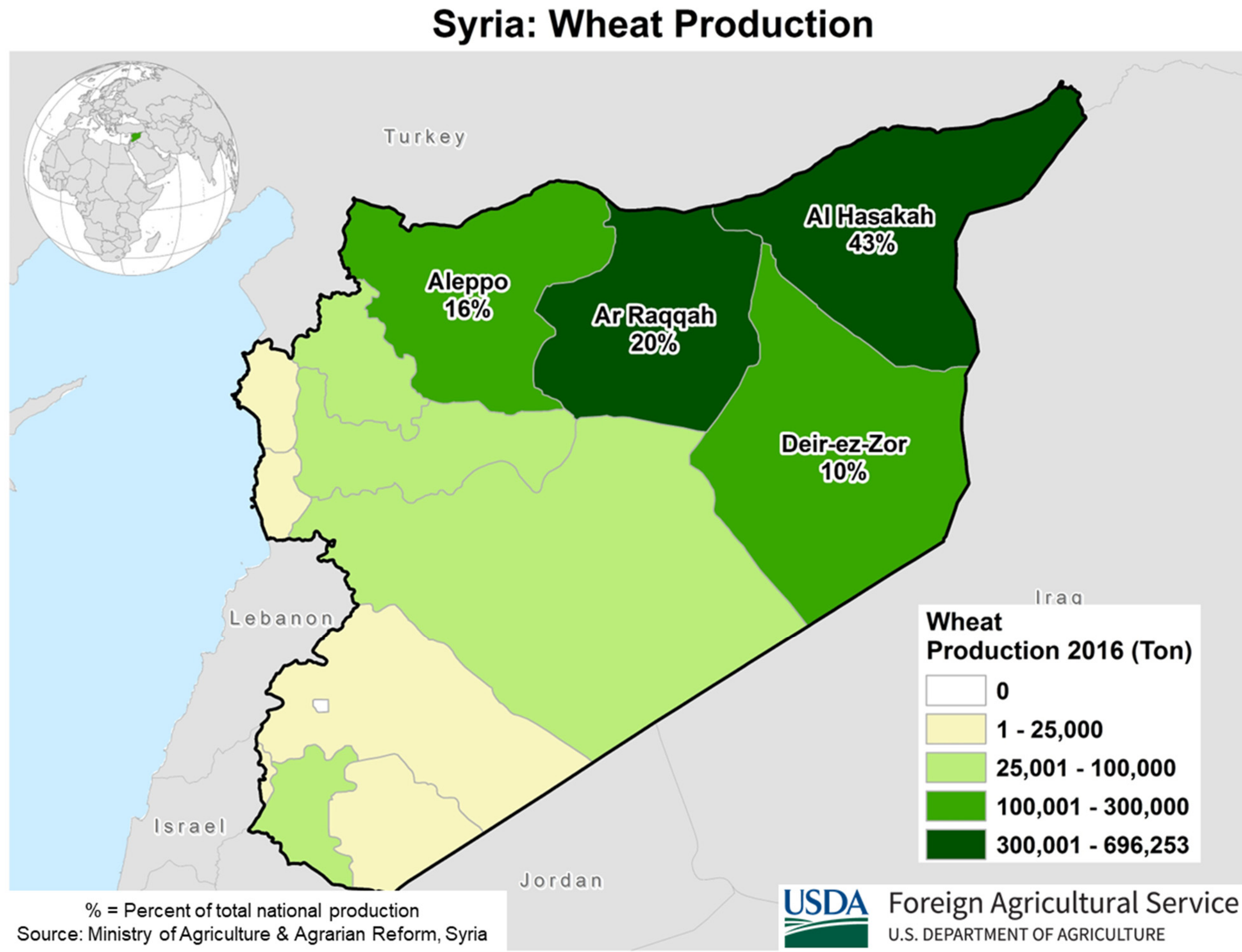

Figure 9. The geographic distribution of wheat production in Syria. Source: Ministry of Agriculture & Agrarian Reform, Syria

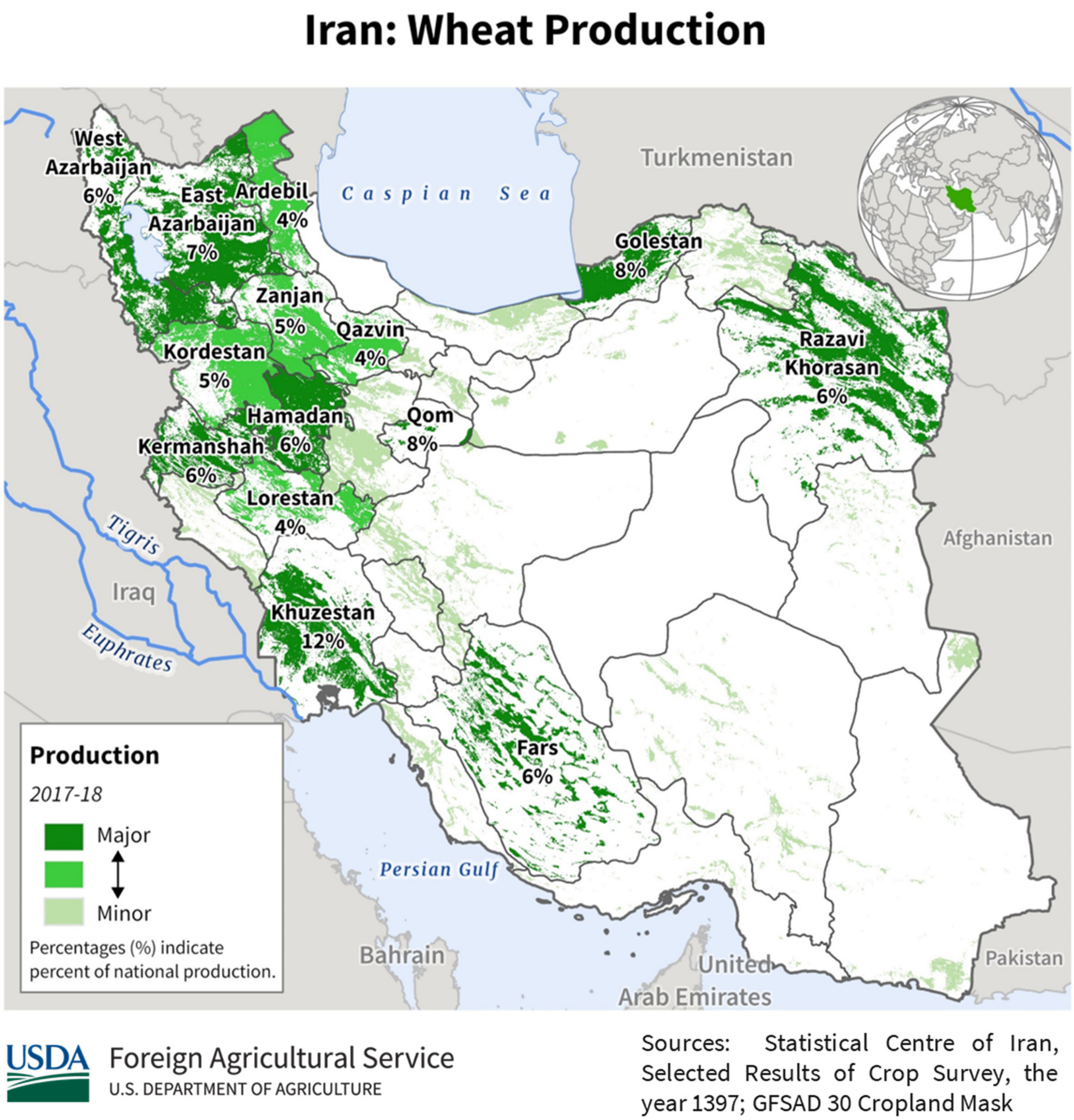

Figure 10. The spatial distribution of wheat production in Iran. Sources: Statistical Centre of Iran, Selected Results of Crop Survey, the year 1397; GFSAD 30 Cropland Mask

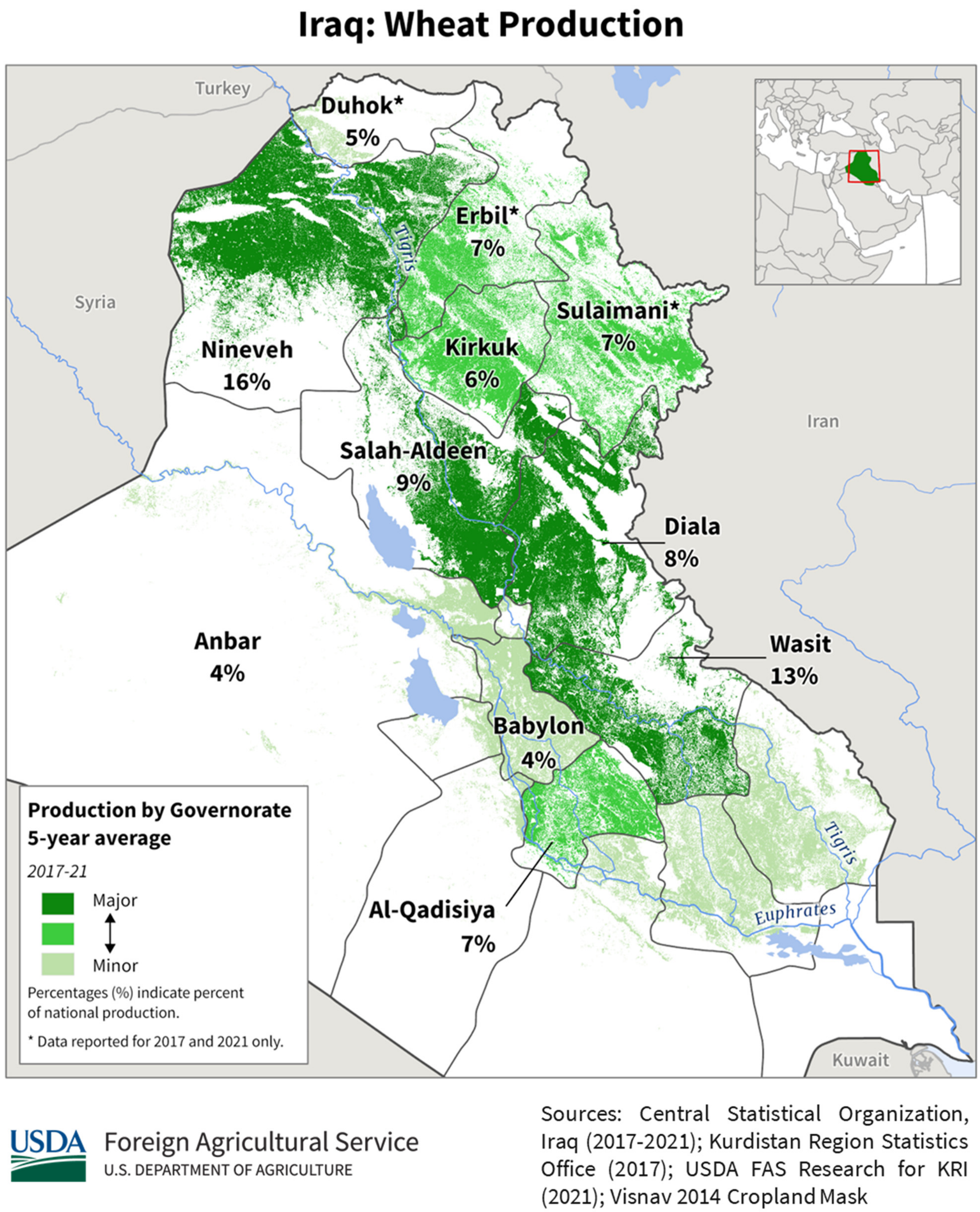

Figure 11. The spatial distribution of wheat production in Iraq. Sources: Central Statistical Organization, Iraq (2017-2021); Kurdistan Region Statistics Office (2017); USDA FAS Research for KRI (2021); Visnav 2014 Cropland Mask

Fertile Crescent: NDVI Anomaly at the Beginning of March

February 26 – March 4, 2024

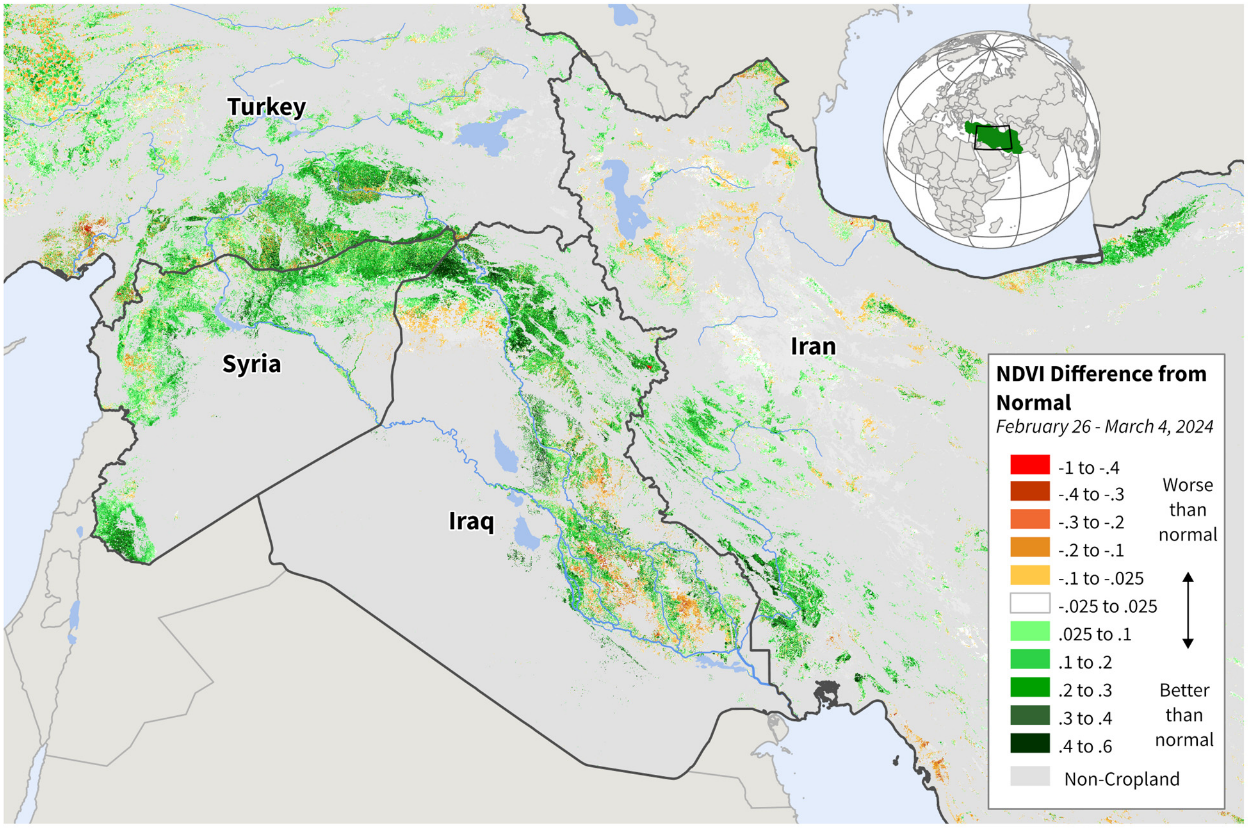

Figure 12. Analysis of crop conditions in early March using the satellite-derived MODIS Normalized Difference Vegetation Index (NDVI) indicated above-normal vegetation health as crops entered greening stages and were rapidly advancing towards maturity in the southern areas of the Middle East. Sources: NASA MODIS 8-Day NDVI Anomaly; ESA Worldview 2021 Crop Mask

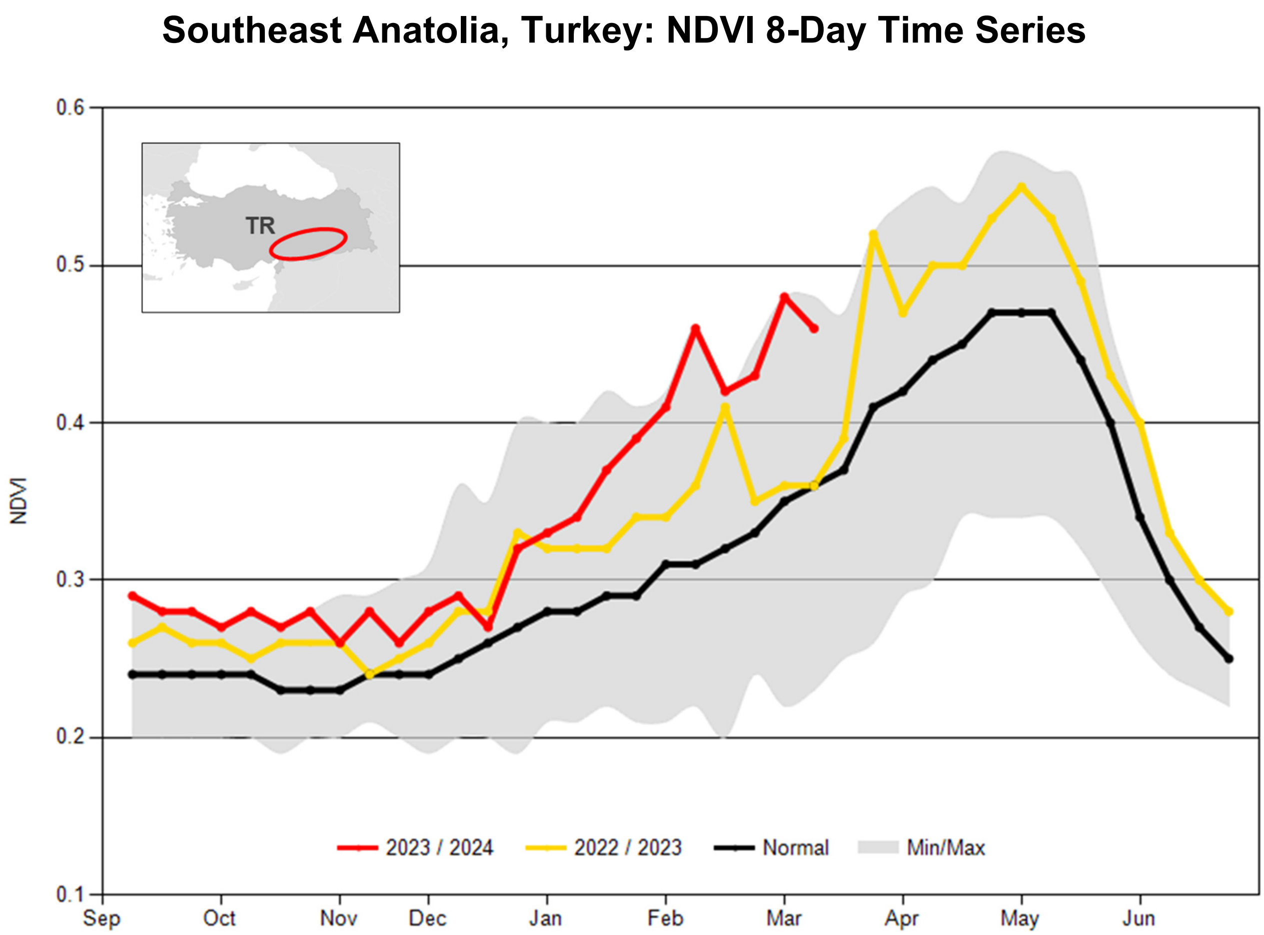

Figure 13. Analysis of crop conditions using the satellite-derived MODIS Normalized Difference Vegetation Index (NDVI) indicates above-average crop conditions during green-up in Southeast Anatolia, where 16 percent of Turkey's wheat crop is grown. Sources: USDA/NASA Global Agricultural Monitoring (GLAM) MODIS Terra 8-day NDVI; IIASA 2005 Cropland Mask

Golestan, Iran: NDVI 8-Day Time Series

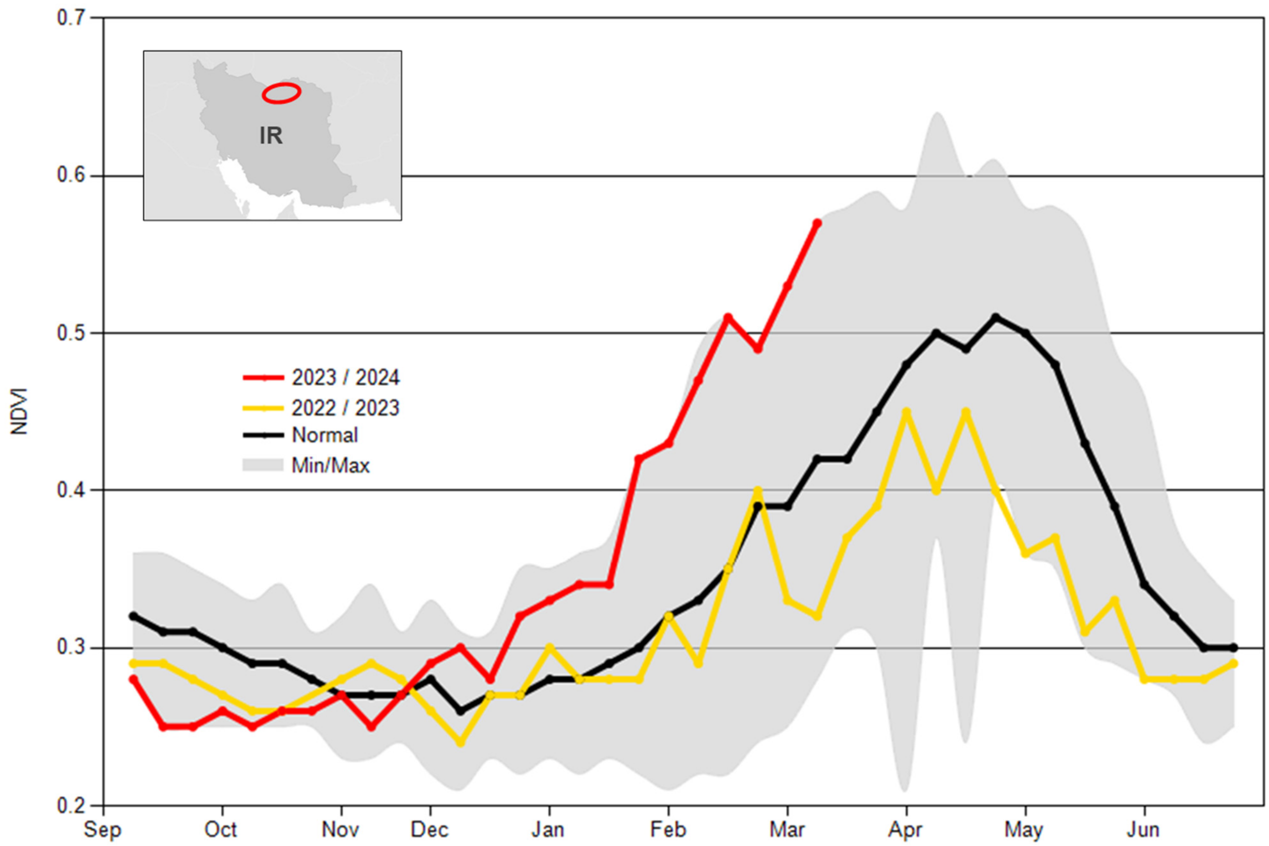

Figure 14. Analysis of crop conditions using the satellite-derived MODIS Normalized Difference Vegetation Index (NDVI) indicates well above-average crop conditions during green-up in Golestan, where 8 percent of Iran's wheat crop is grown. Sources: USDA/NASA Global Agricultural Monitoring (GLAM) MODIS Terra 8-day NDVI; IIASA 2005 Cropland Mask

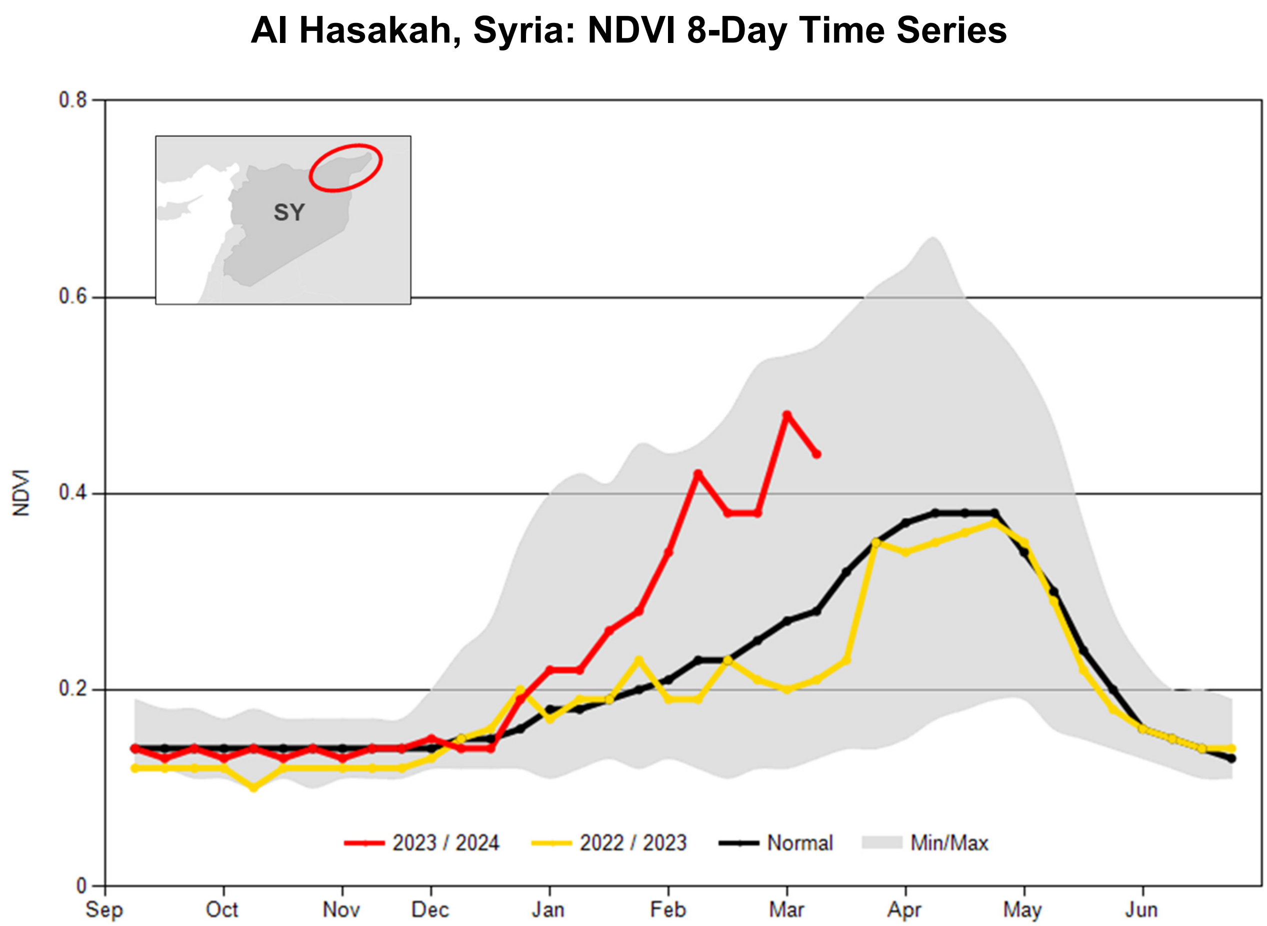

Figure 15. Analysis of crop conditions using the satellite-derived MODIS Normalized Difference Vegetation Index (NDVI) indicates above-average crop conditions during green-up in Al Hasakah, where 43 percent of Syria's wheat crop is grown. Sources: USDA/NASA Global Agricultural Monitoring (GLAM) MODIS Terra 8-day NDVI; IIASA 2005 Cropland Mask

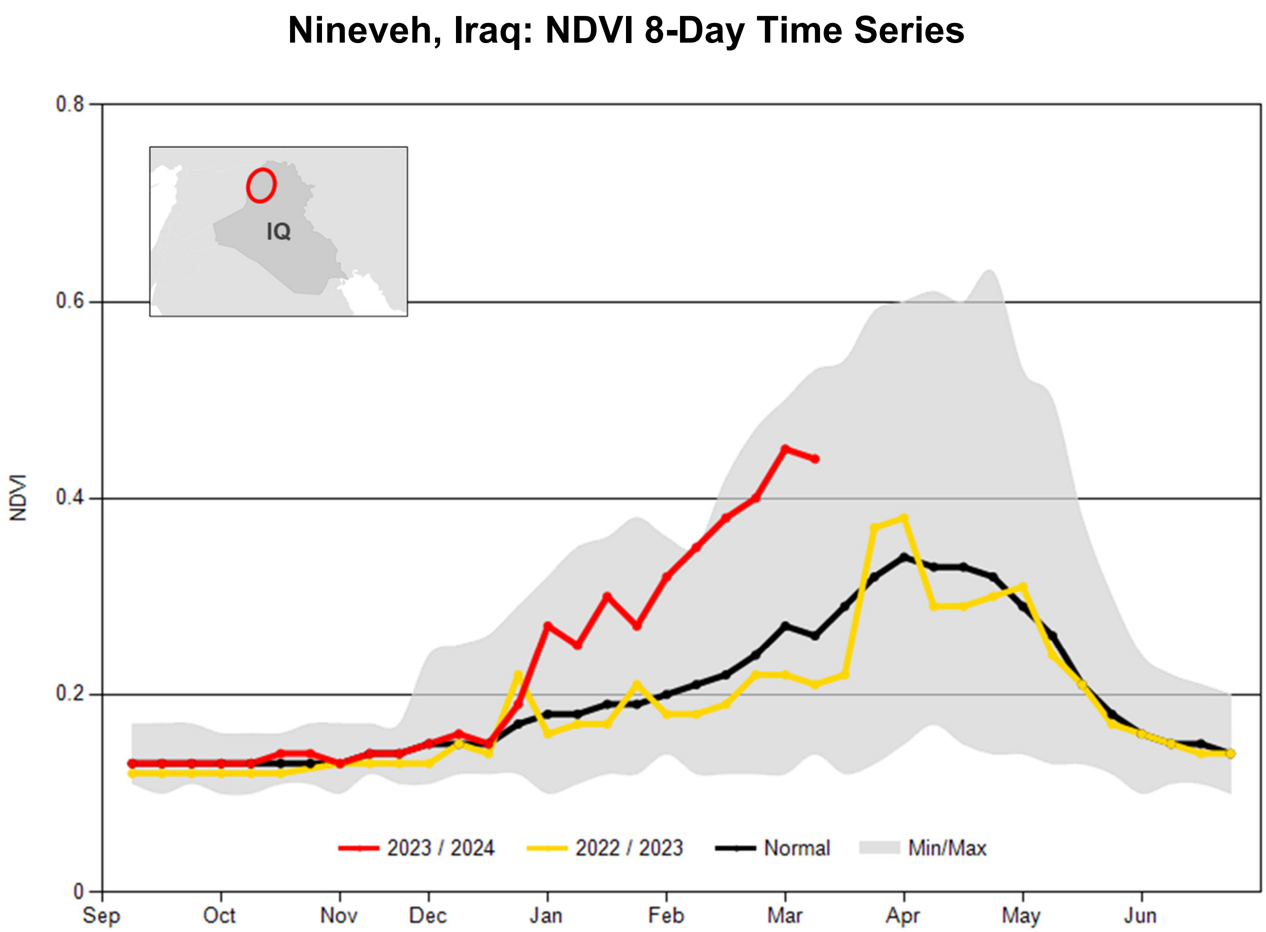

Figure 16. Analysis of crop conditions using the satellite-derived MODIS Normalized Difference Vegetation Index (NDVI) indicates above-average crop conditions during green-up in Nineveh, where 16 percent of Iraq's wheat crop is grown. Sources: USDA/NASA Global Agricultural Monitoring (GLAM) MODIS Terra 8-day NDVI; IIASA 2005 Cropland Mask

Khuzestan, Iran: NDVI 8-Day Time Series

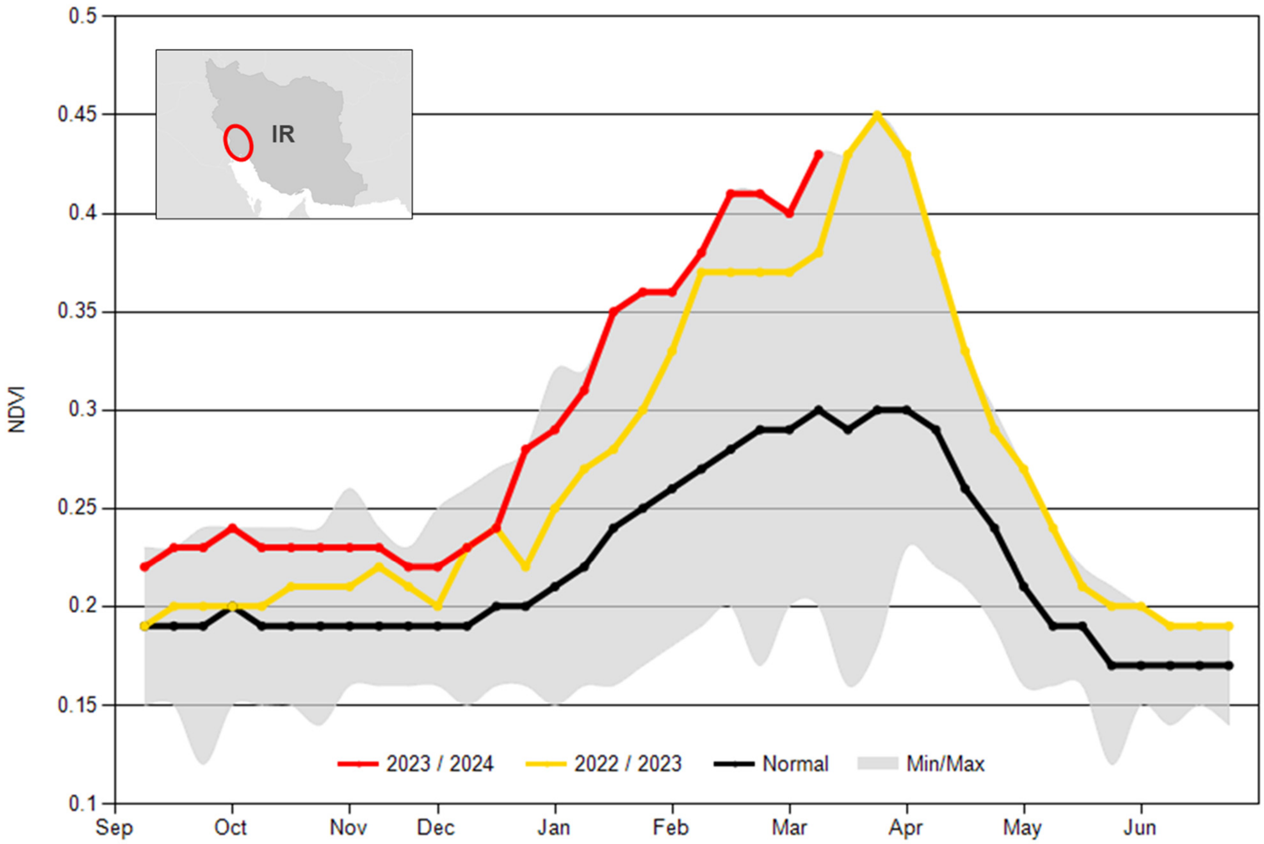

Figure 17. Analysis of crop conditions using the satellite-derived MODIS Normalized Difference Vegetation Index (NDVI) indicates well above-average crop conditions during green-up in Khuzestan, where 12 percent of Iran's wheat crop is grown. Sources: USDA/NASA Global Agricultural Monitoring (GLAM) MODIS Terra 8-day NDVI; IIASA 2005 Cropland Mask

Southeast Anatolia, Turkey: Imagery Analysis of Winter Wheat

January 21 – February 20, 2024

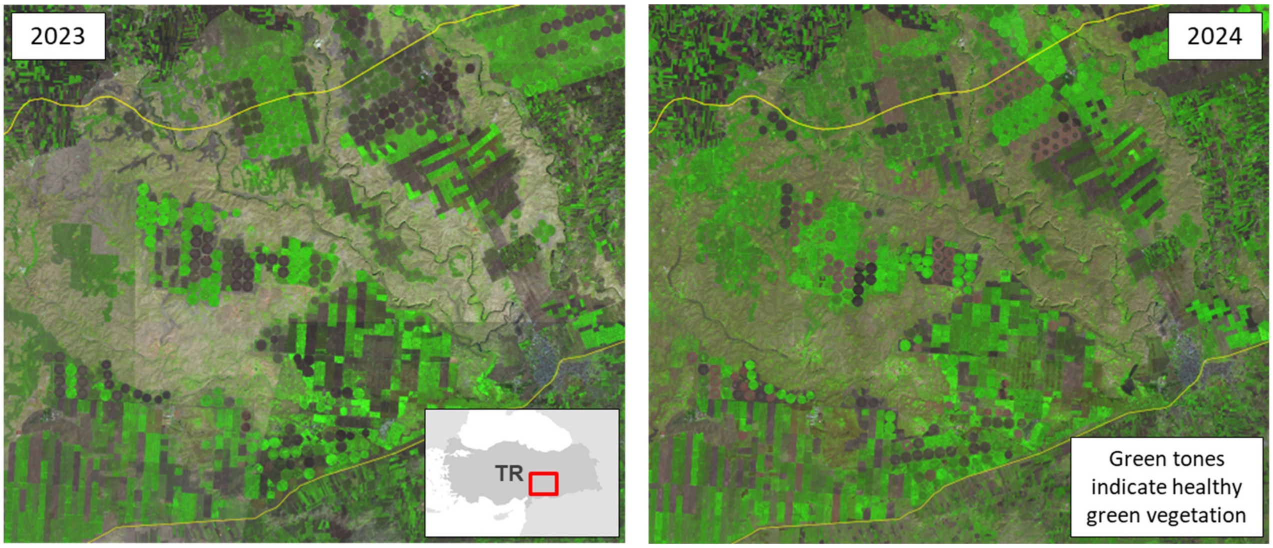

Figure 18. Imagery analysis of winter wheat during green-up in Southeast Anatolia, Turkey indicates better crop conditions than last year's above-average crop. Shades of bright green indicate healthy green vegetation. Source: GDA Corp, GeoChronicles (Sentinel-2/Landsat-8 30-day composite, SWIR1 / NIR / Red bands) 10-meter resolution imagery

Al Hasakah, Syria: Imagery Analysis of Winter Wheat

January 21 – February 20, 2024

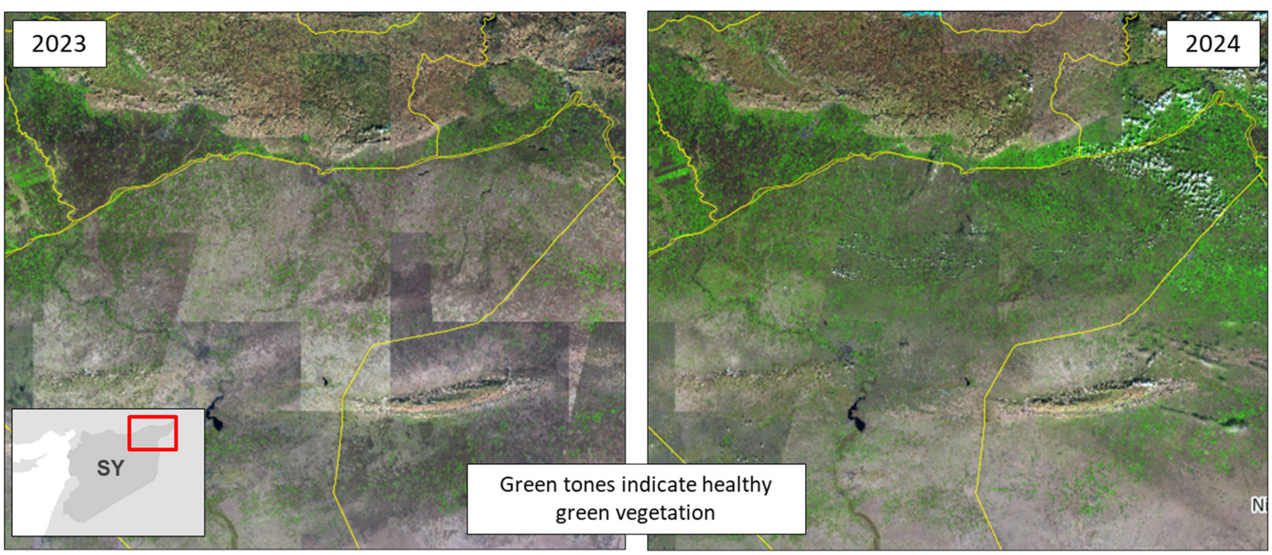

Figure 19. Imagery analysis of winter wheat during green-up in Al Hasakah, Syria indicates improved crop conditions over last year. Shades of bright green indicate healthy green vegetation. Source: GDA Corp, GeoChronicles (Sentinel-2/Landsat-8 30-day composite, SWIR1 / NIR / Red bands) 10-meter resolution imagery

Nineveh, Iraq: Imagery Analysis of Winter Wheat

January 21 – February 20, 2024

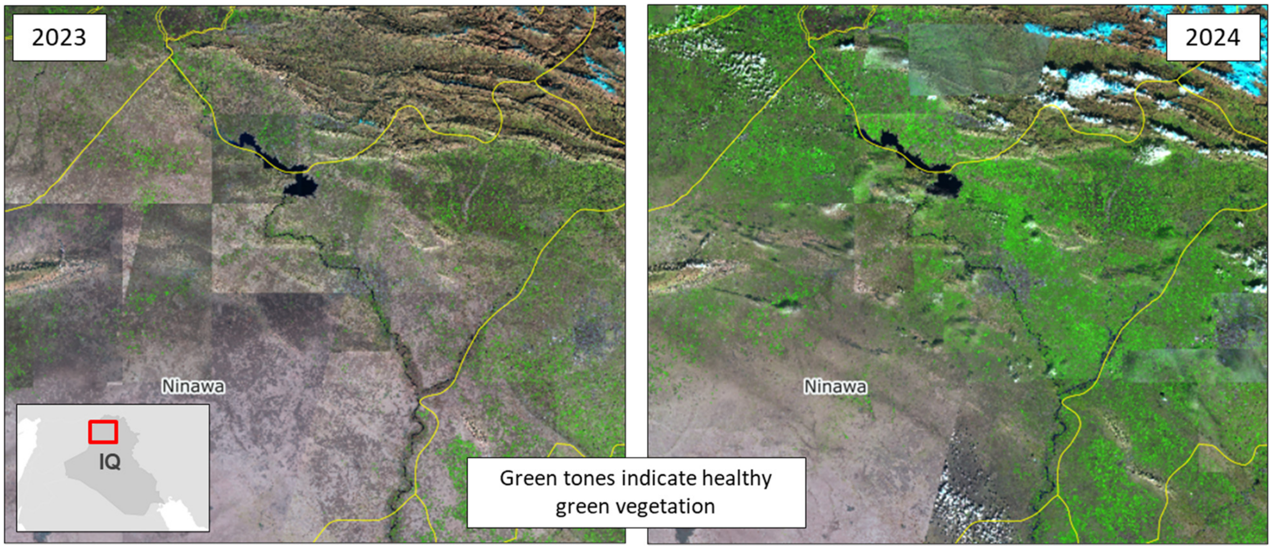

Figure 20. Imagery analysis of winter wheat during green-up in Nineveh (Ninawa), Iraq indicates improved crop conditions over last year. Shades of bright green indicate healthy green vegetation. Source: GDA Corp, GeoChronicles (Sentinel-2/Landsat-8 30-day composite, SWIR1 / NIR / Red bands) 10-meter resolution imagery

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