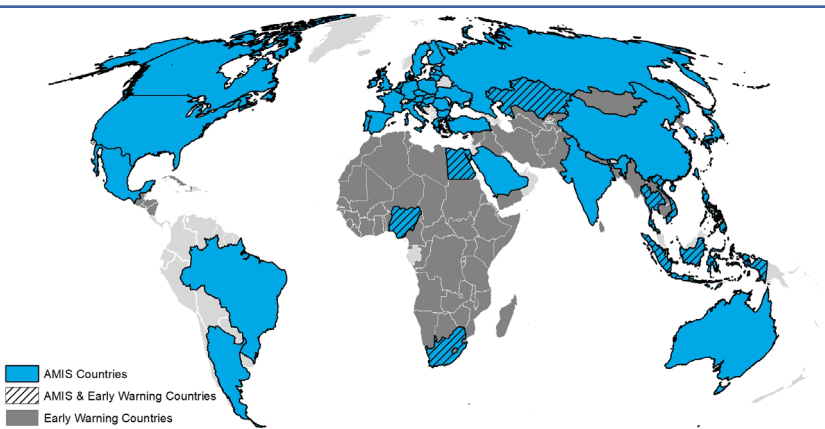




Crop Monitor for AMIS

Overview:

At the end of June, conditions are mixed for wheat, maize, rice, and soybeans. For wheat in the northern hemisphere, winter wheat is harvesting as spring wheat develops under mixed conditions. In the southern hemisphere, conditions are mixed in Argentina and eastern Australia. Maize conditions are mixed as dry conditions spread across the US, Mexico, northern China, and central Ukraine. Rice conditions are mixed as a late arriving monsoon delays sowing activities across India and Thailand. Soybean harvesting wraps up in Argentina as dry conditions develop in the US, Mexico, and northern China.

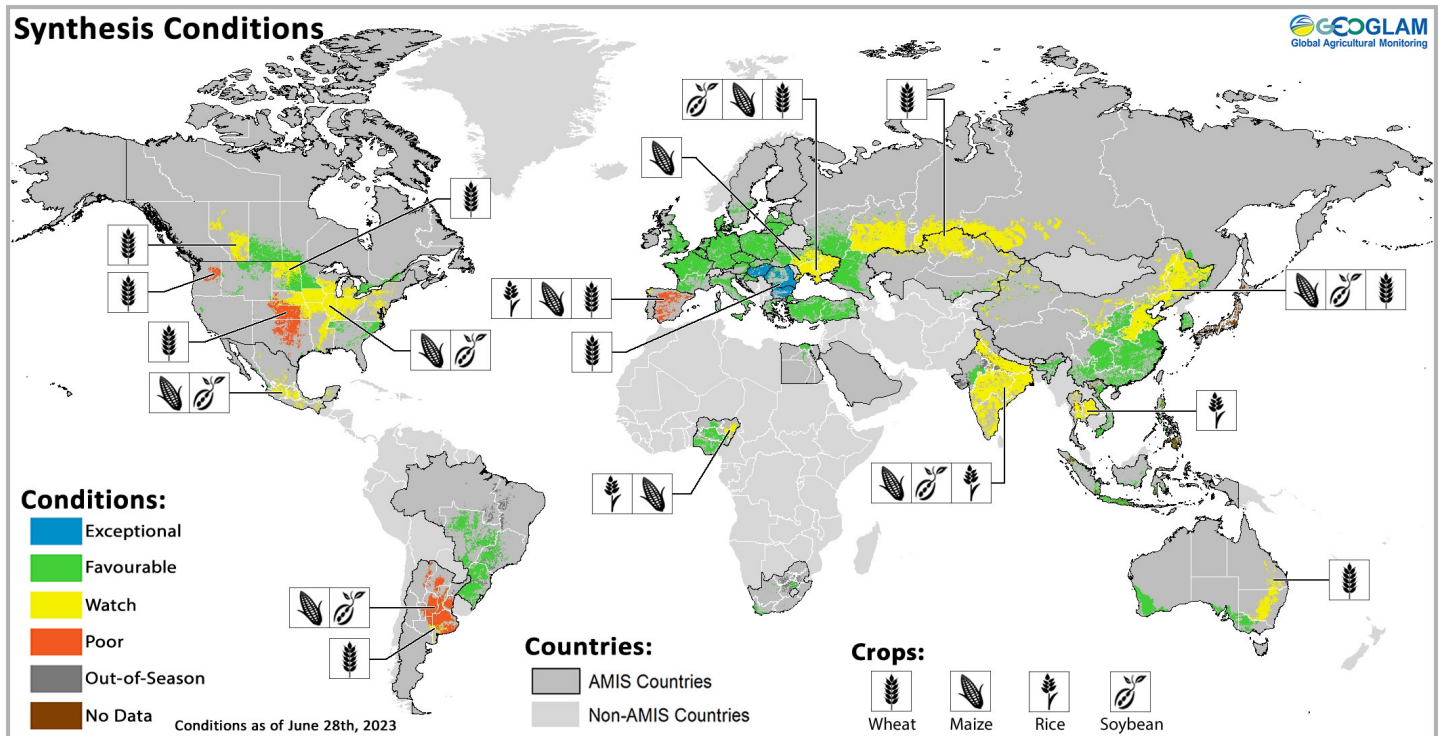


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Assessment based on information as of June 28th 2023

At a glance for AMIS countries (as of June 28th)



Global crop condition map synthesizing information for all four AMIS crops as of June 28th. Crop conditions over the main growing areas for wheat, maize, rice, and soybean are based on a combination of national and regional crop analyst inputs along with earth observation data from all Crop Monitors. **Crops that are in other than favourable conditions are displayed on the map with their crop symbol.**

Crop Conditions at a Glance

Wheat - In the northern hemisphere, winter wheat harvesting is ongoing and spring wheat sowing is wrapping up under mixed conditions. In the southern hemisphere, sowing is ongoing in Argentina under mixed conditions.

Maize - In the southern hemisphere, harvest is continuing in Argentina under poor conditions. In the northern hemisphere, drought is developing in the US, Mexico, northern China, and central Ukraine.

Forecasts at a Glance

Climate Influences – El Niño is currently present, and models predict that this will likely be a moderate or strong El Niño event that is expected to last through early 2024. Positive Indian Ocean Dipole (IOD) conditions may also develop during July to November.

Argentina – The short-term (two weeks) forecast indicates likely average precipitation across the majority of agricultural areas.

Rice - In China, harvesting of early-season rice is beginning. In India, the Kharif season begins with a delayed start. In Southeast Asia, sowing of wet-season rice progresses in the northern countries while in Indonesia sowing of dry-season rice continues.

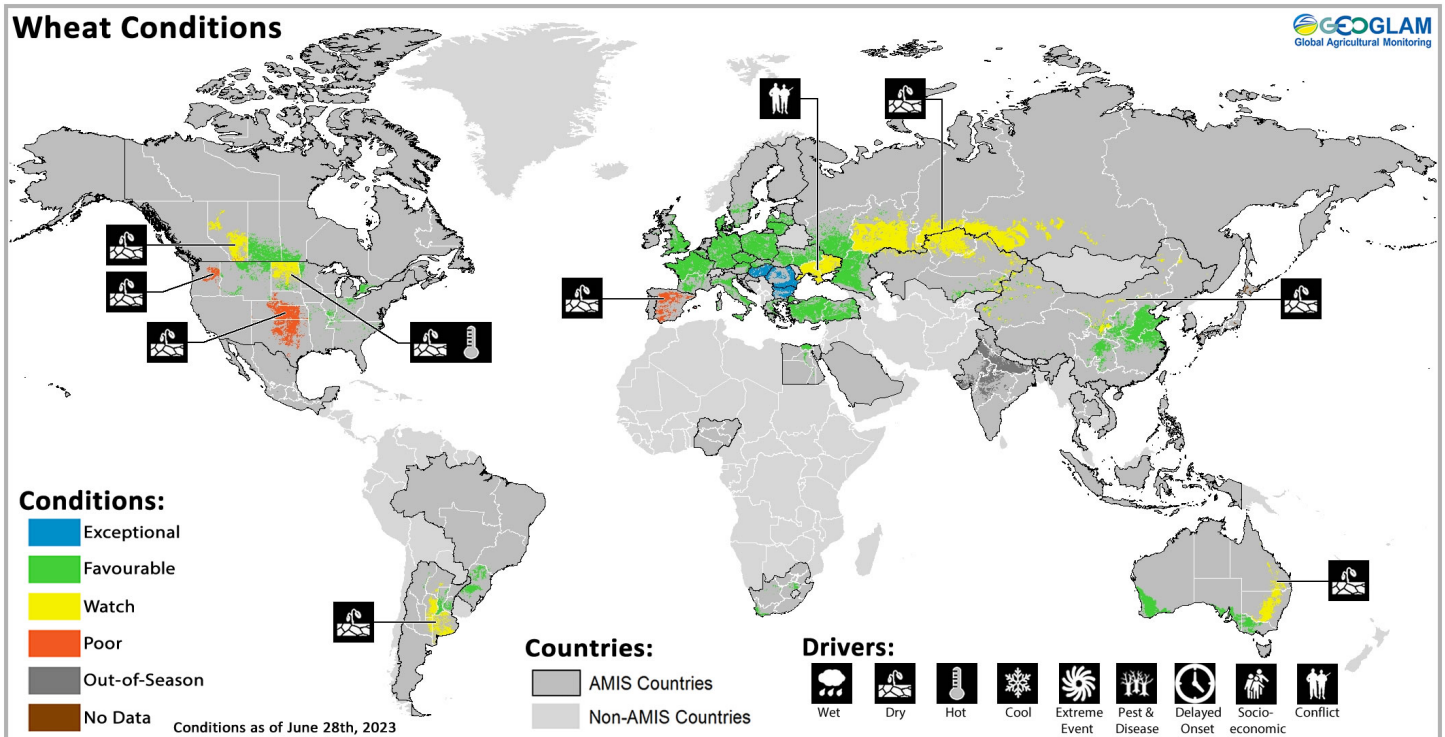
Soybeans - In the southern hemisphere, harvest is wrapping up in Argentina with poor yields. In the northern hemisphere, drought is affecting crops in the US and India begins the season with a delayed start.

Southeast Asia – During July to September (JAS) 2023, precipitation is likely to be above-average in the northern countries, while below average in the southern countries. At the same time, temperatures are likely to be warmer-than-average.

The United States – The short-term (two weeks) forecast indicates likely above-average precipitation across Mid-West and New England, while below-average in the Southwest.

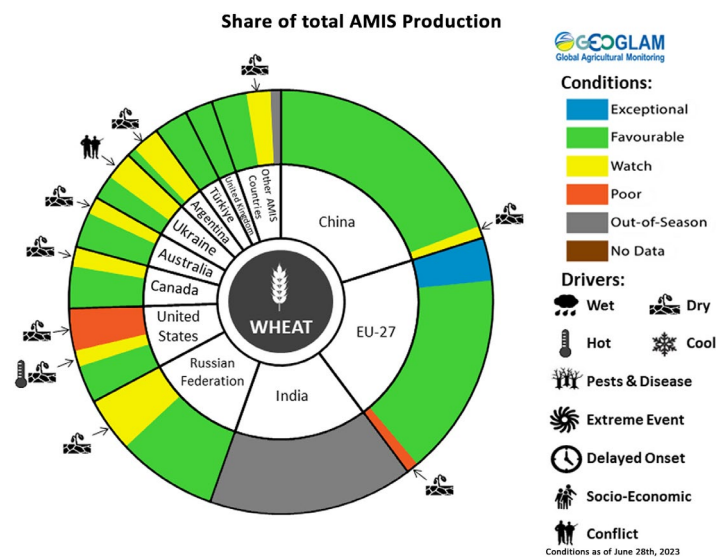
While the Crop Monitor for AMIS is primarily focused on documenting crop conditions based on environmental factors, the war in Ukraine and in other conflict areas will very likely negatively impact the ability of the crop to be harvested.

Wheat Conditions for AMIS Countries



Wheat crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs along with earth observation data. Crop condition information is based upon information as of June 28th. Where crops are in other than favourable conditions the climatic drivers responsible for those conditions are displayed. Crop Season Specific Maps can be found in Appendix 2.

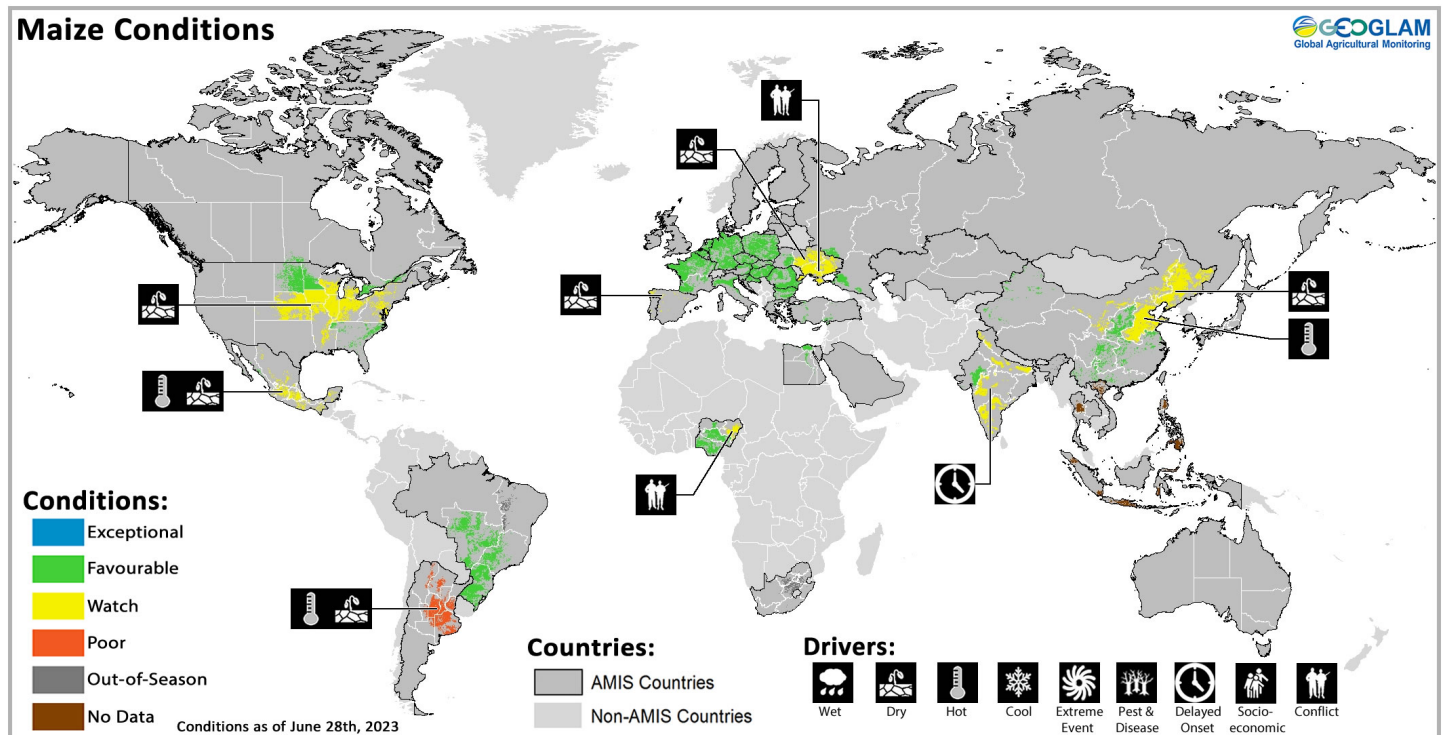
Wheat: In the **EU**, conditions are favourable, except for the Iberian Peninsula due to a catastrophic drought. In the **UK**, a wet spring has supported conditions through a dry May and June. In **Türkiye**, conditions are favourable thanks to ample spring rainfall. In **Ukraine**, harvesting is beginning in the south under favourable conditions away from the war zones. In the **Russian Federation**, harvesting of winter wheat is beginning under favourable conditions. Spring wheat sowing is wrapping up under dry conditions. In **China**, harvesting of winter wheat wraps up after record rainfall during the harvest that has likely degraded grain quality and localized yields. Spring wheat is under developing dryness in the north. In the **US**, harvesting of winter wheat is underway with poor conditions in the central and southern Great Plains due to prolonged drought. Spring wheat is under mixed conditions in parts of the Dakotas due to recent hot and dry weather. In **Canada**, conditions are mixed for both winter and spring wheat due to expanding drought across the western Prairies. In **Australia**, average to above-average June rainfall has benefited crop establishment and growth across most of the country; however, dry conditions persist across the east. In **Argentina**, sowing is beginning under mixed conditions as soil moisture levels begin to recover.



For detailed description of the pie chart please see box on page 6.

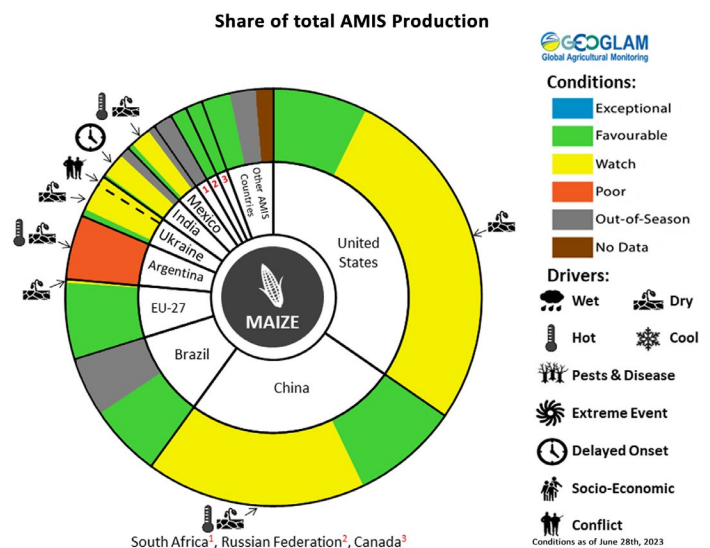
* Assessment based on information as of June 28th

Maize Conditions for AMIS Countries



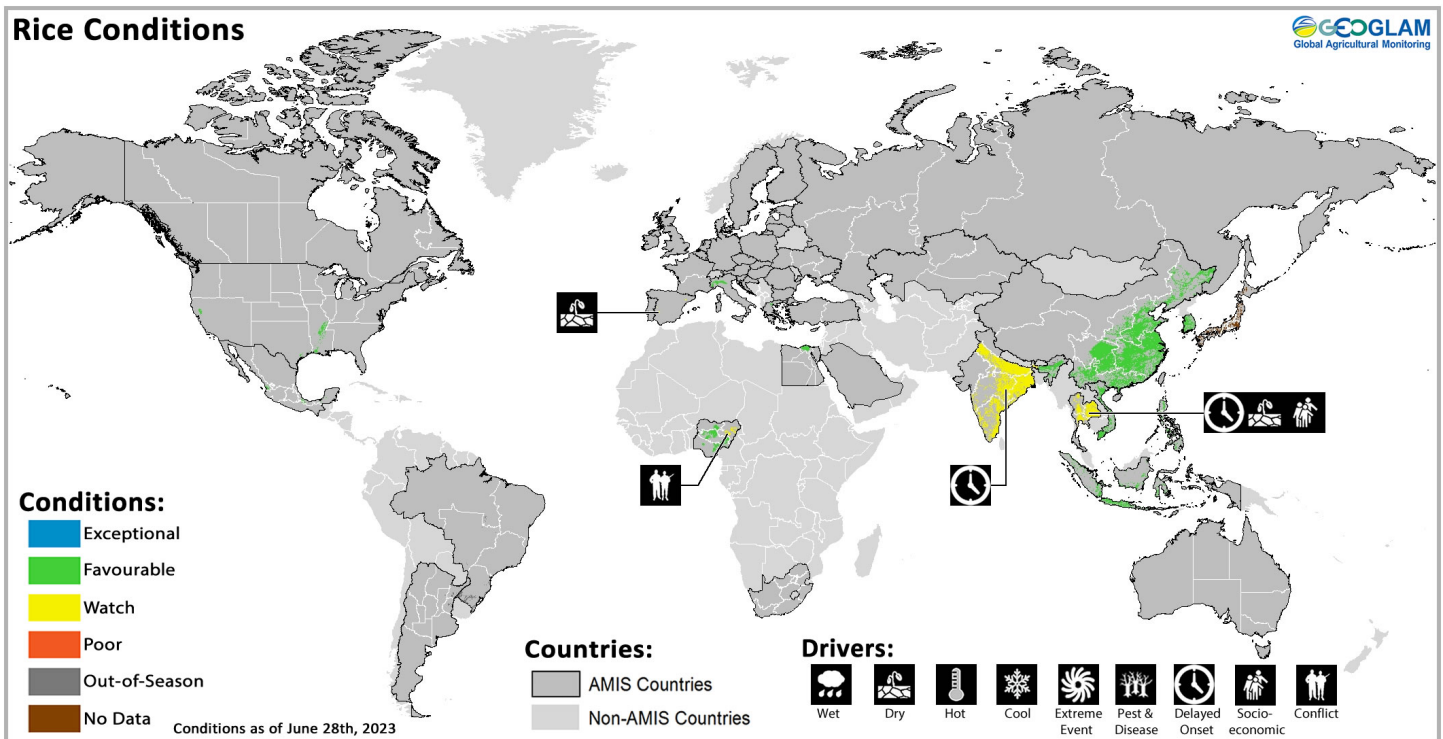
Maize crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs along with earth observation data. Crop condition information is based upon information as of June 28th. Where crops are in other than favourable conditions the climatic drivers responsible for those conditions are displayed. Crop Season Specific Maps can be found in Appendix 2.

Maize: In **Brazil**, the summer-planted crop (larger season) is primarily in the ripening to harvesting stages under favourable conditions. There is an increase in total sown area compared to last year. In **Argentina**, conditions are poor as the harvest is wrapping up for the early-planted crop (typically larger season) and as harvesting of the late-planted crop (typically smaller season) proceeds slowly. In the **US**, drought conditions are developing across much of the Corn Belt following an extremely dry spring. Good rains over the next month will be important for maintaining yields. In **Mexico**, harvesting of the Autumn-Winter crop (smaller season) wraps up as the Spring-Summer crop (larger season) suffers under drought conditions. In **Canada**, sowing is wrapping up under favourable conditions. In **China**, conditions are mixed as dryness develops in parts of the northeast and extreme heat is experienced in parts of the North China Plain. In **India**, sowing is off to a delayed start due to the late onset of the monsoon. In the **EU**, conditions are generally favourable as rain returns to the southern regions. In **Ukraine**, conditions are mixed due to recent hot and dry weather in the central regions and the implications of the ongoing war. In the **Russian Federation**, conditions are favourable.



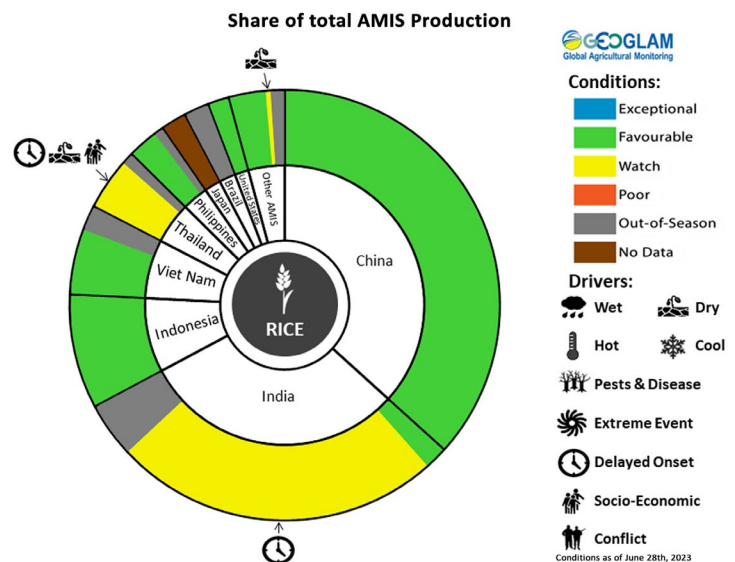
For detailed description of the pie chart please see box on page 6.

Rice Conditions for AMIS Countries



Rice crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs along with earth observation data. Crop condition information is based upon information as of June 28th. Where crops are in other than favourable conditions the climatic drivers responsible for those conditions are displayed. Crop Season Specific Maps can be found in Appendix 2.

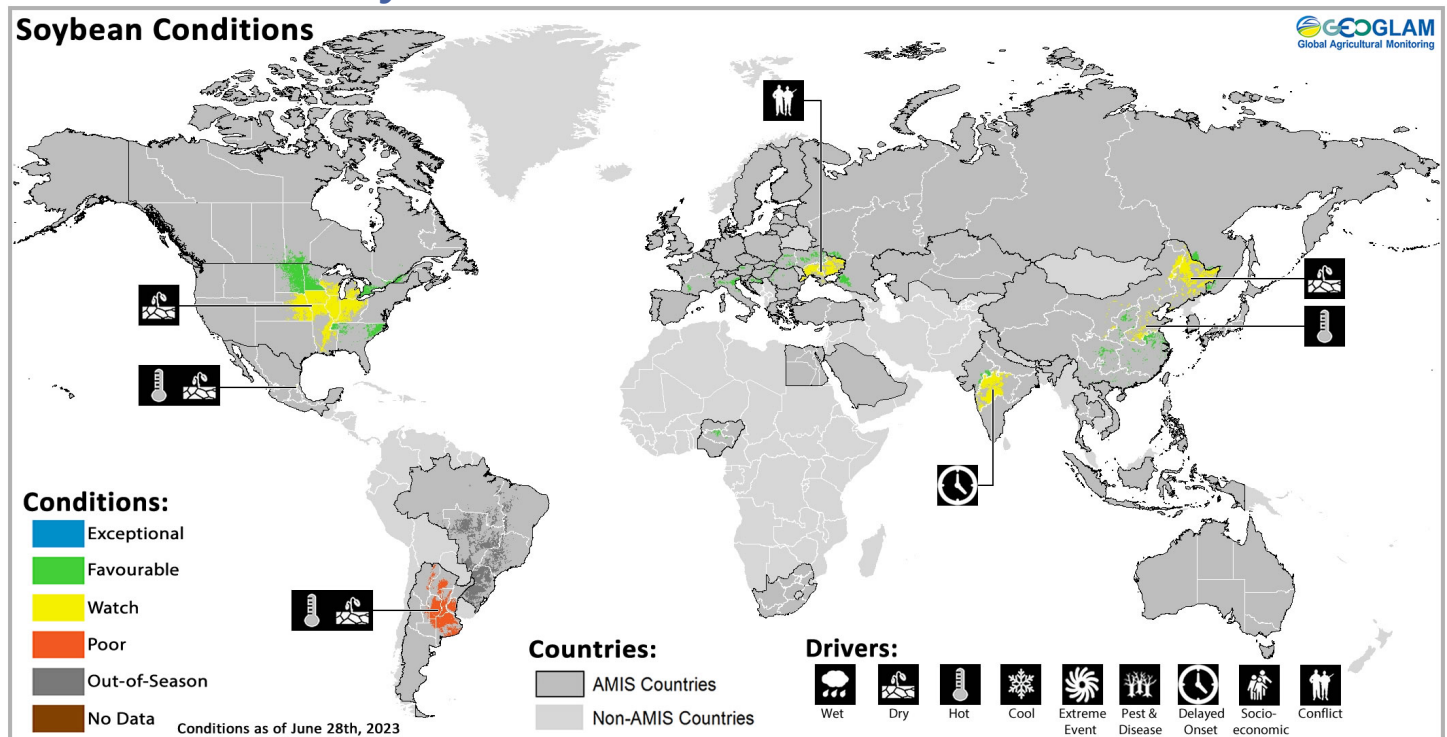
Rice: In **China**, harvesting of early-season rice is beginning under generally favourable conditions as the sowing of late-season rice begins. Above-average rainfall in the south is supporting favourable conditions for single-season rice. In **India**, sowing of the Kharif crop is beginning after a slightly delayed start due to the late onset of the monsoon. In **Indonesia**, harvesting of wet-season rice is wrapping up under favourable conditions, albeit with a slight reduction in the harvested area compared to last year. Conditions are favourable as the sowing of dry-season rice enters the third month. In **Viet Nam**, harvesting of dry-season rice (Winter-Spring) is ongoing in the north under favourable conditions while the sowing of wet-season rice (Summer-Autumn) begins. In the south, wet-season rice (Summer-Autumn) is under favourable conditions. In **Thailand**, sowing of wet-season rice has begun under mixed conditions due to a later-than-normal start of the rainy season and the high cost of agricultural inputs. The total sown area is expected to be reduced compared to last year. In the **Philippines**, wet-season rice is in the tillering to the young panicle-forming stage under favourable conditions. In the **US**, conditions are favourable with an increase in sown area compared to last year.



For detailed description of the pie chart please see box on page 6.

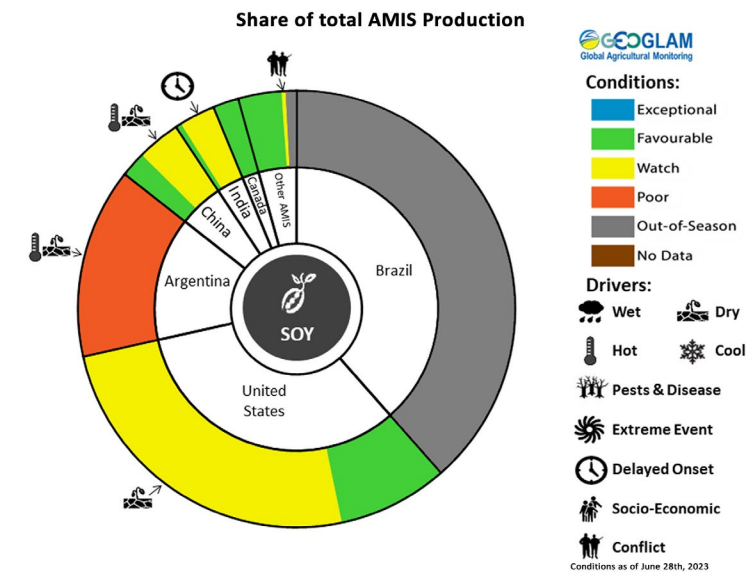
* Assessment based on information as of July 28th

Soybean Conditions for AMIS Countries



Soybean crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs along with earth observation data. Crop condition information is based upon information as of June 28th. Where crops are in other than favourable conditions the climatic drivers responsible for those conditions are displayed. Crop Season Specific Maps can be found in Appendix 2.

Soybeans: In **Argentina**, harvesting is wrapping up for both the early-planted crop (larger season) and the late-planted crop (smaller season) with poor yields and lower quality due to drought and extreme heat throughout the season. In the **US**, an extremely dry spring has reduced crop conditions across much of the main growing areas. Good rainfall during July and August will be important to preserve yields. In **Canada**, sowing is completed, and conditions are favourable. In **China**, conditions are mixed in the main producing areas due to extremely high temperatures in the North China Plain along with developing dry conditions in the northeast. In **India**, a slower-than-normal start to the monsoon has delayed the start of sowing this season. In **Ukraine**, sowing is wrapping up under generally favourable conditions away from the frontlines of the war.



For detailed description of the pie chart please see box below.

Information on crop conditions in non-AMIS countries can be found in the [GEOGLAM Crop Monitor for Early Warning](#), published July 6th

Pie chart description: Each slice represents a country's share of total AMIS production (5-year average). Main producing countries (representing 95 percent of production) are shown individually, with the remaining 5 percent grouped into the "Other AMIS Countries" category. The proportion within each national slice is coloured according to the crop conditions within a specific growing area; grey indicates that the respective area is out of season. Sections within each slice are weighted by the sub-national production statistics (5-year average) of the respective country. The section within each national slice also accounts for multiple cropping seasons (i.e., spring and winter wheat). When conditions are other than 'favourable', icons are added that provide information on the key climatic drivers affecting conditions.

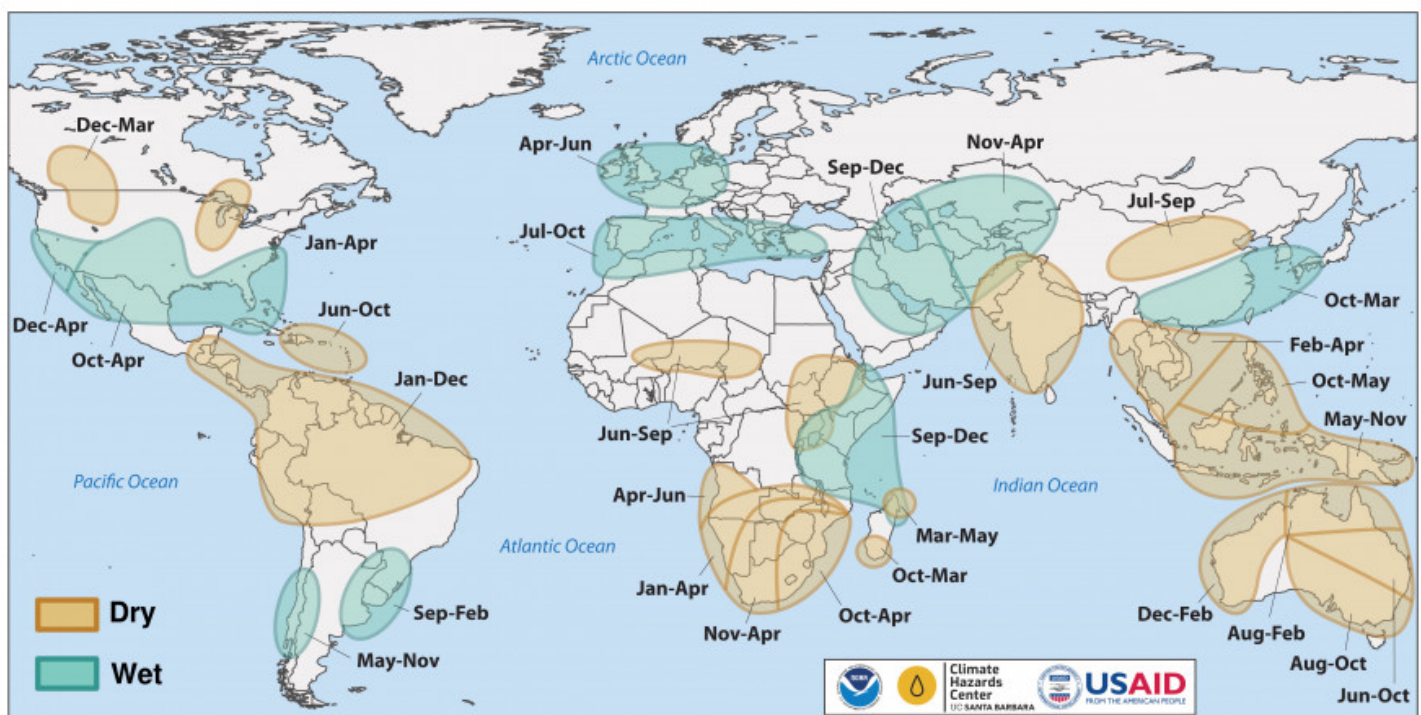
Climate Influences: El Niño Advisory and Positive IOD Watch

The El Niño-Southern Oscillation (ENSO) is currently in the El Niño phase. Models predict that this will likely be a moderate or strong El Niño event that is expected to last through early 2024.

El Niño events tend to enhance rainfall in Central Asia, southern North America, south-eastern South America, southern Europe, eastern and southern East Africa, and southern and eastern China. Drier-than-average conditions tend to occur in Central America, the Caribbean, northern South America, parts of western and northern East Africa, Southern Africa, India, Northern China, the Maritime Continent, and Australia.

Positive Indian Ocean Dipole (IOD) conditions may also develop during July to November, according to the Australian Bureau of Meteorology forecast. Positive IOD conditions can enhance El Niño-related drying influences in Australia and the Maritime Continent, and wetting influences during the East Africa short rains.

Source: UCSB Climate Hazards Center

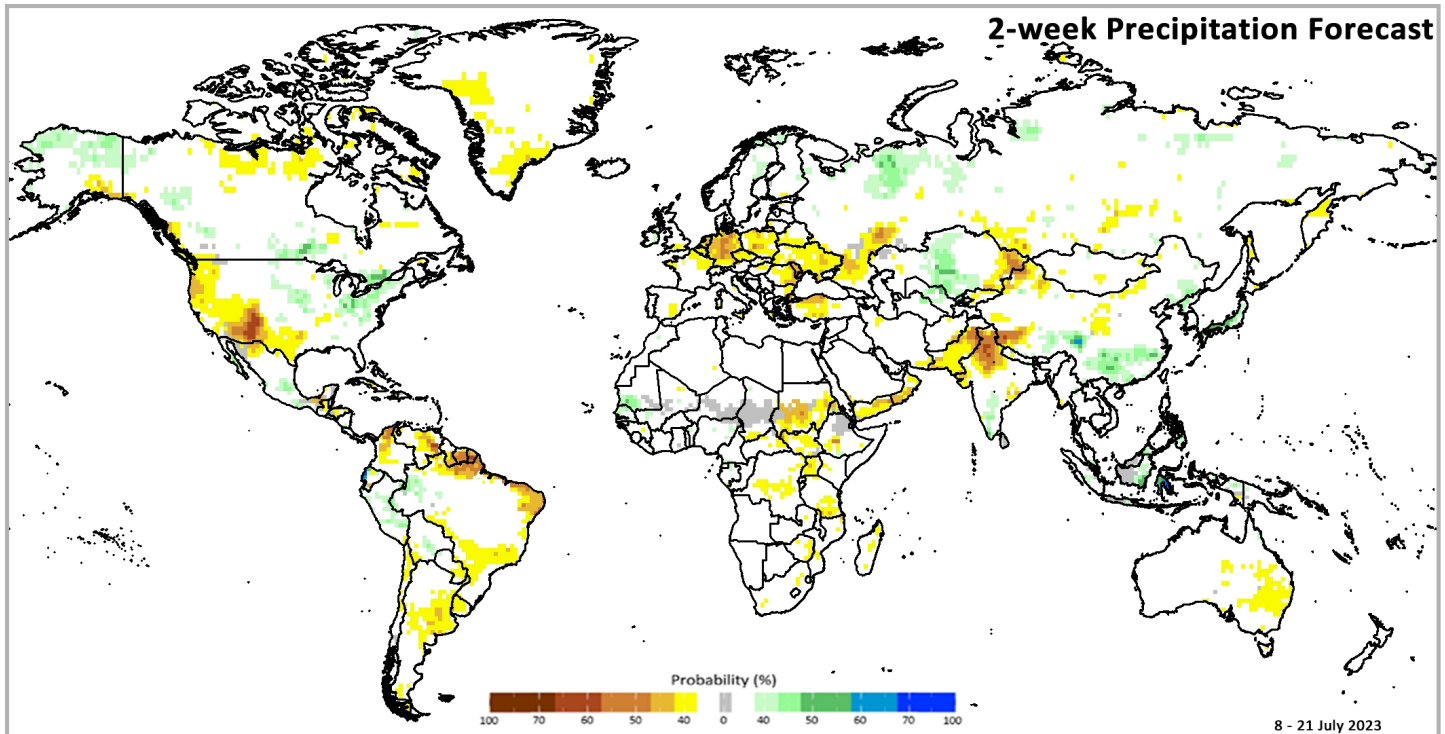


Location and timing of likely above- and below-average precipitation related to El Niño events. Based upon observed precipitation during 22 El Niño events since 1950, wet and dry correspond to a statistically significant increase in the frequency of precipitation in the upper and lower thirds of historical values, respectively. Statistical significance at the 95% level is based on the resampling of precipitation during neutral El Niño-Southern Oscillation conditions. Source: [FEWS NET & NOAA & CHC](#)

Global Two-week Forecast of Areas with Above or Below-Average Precipitation

The two-week forecast (Figure 1) indicates a likelihood of above-average rainfall over Ontario and Quebec in Canada, the eastern Mid-west and western New England in the US, central Mexico, eastern Peru, western Brazil, southwest Mauritania, northern Senegal, central Kazakhstan, central Uzbekistan, southern India, southern China, southern Philippines, eastern Indonesia, western Democratic Republic of Korea, and southern Japan.

There is also a likelihood of below-average rainfall over western and southwest US, western Columbia, western Venezuela, southern Guyana, Suriname, French Guiana, northern and northeast Brazil, central Argentina, the Netherlands, Germany, Czechia, Poland, Ukraine, Moldova, Romania, northwestern Türkiye, southern Russian Federation, Yemen, Oman, Sudan, South Sudan, southwest Ethiopia, Uganda, southern Tanzania, eastern Kazakhstan, Pakistan, northern India, northwest and southwest China, and eastern Australia.



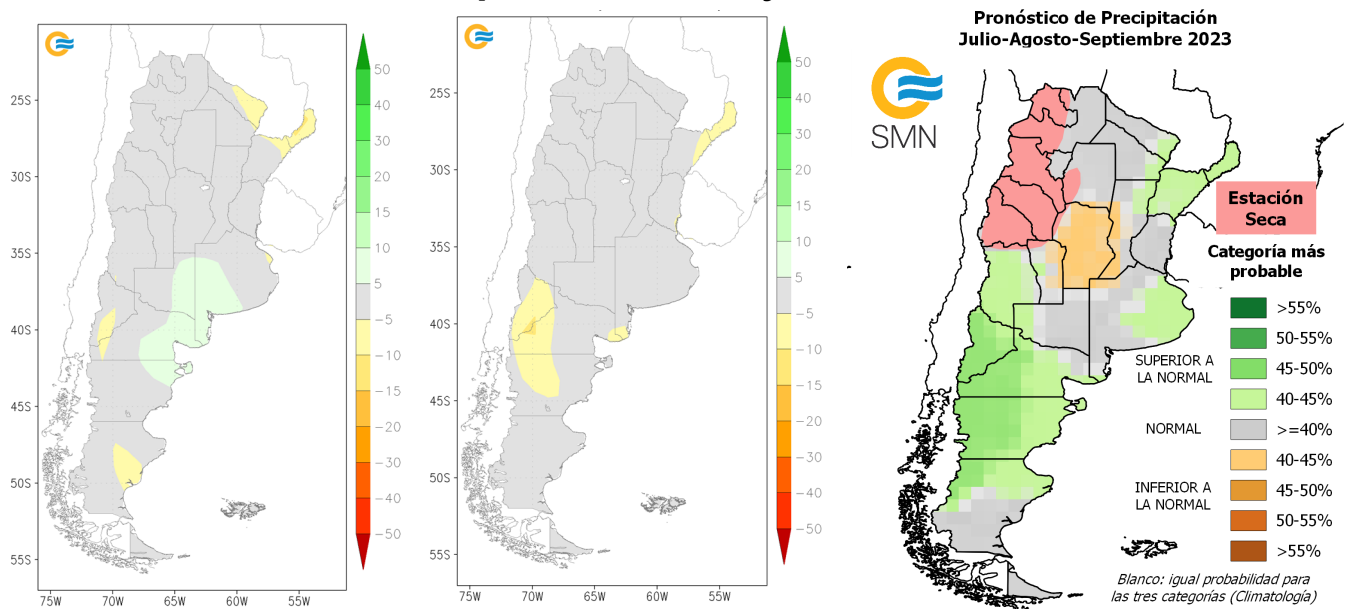
IRI SubX Precipitation Biweekly Probability Forecast for 8 – 21 July 2023, issued on 30 June 2023. The forecast is based on statistically calibrated tercile category forecasts from three SubX models. Source: [IRI Subseasonal Forecasts Maproom](#)

Argentina Outlook

The 5 – 11 July precipitation forecast anomaly (left) indicates likely average rainfall over the majority of growing areas. During the same period, temperatures are likely to be above-average over much of the northern agricultural areas. The 12 – 18 July precipitation forecast anomaly (center) shows likely average rainfall over the majority of growing areas. During the same period, temperatures are likely to be below-average across much of the northern agricultural areas.

The long-term July-August-September 2023 forecast (right) forecasts below-average precipitation over Cordoba, while above-average across eastern Buenos Aires, Corrientes, and Misiones. During the same period, temperatures are likely to be above-average across the majority of agricultural areas.

Precipitation Anomaly Forecasts



Left: 5 – 11 July 2023 forecast precipitation anomaly in mm. **Center** 12 – 18 July 2023 forecast precipitation anomaly in mm. Images from the [National Meteorological Service of Argentina](#). **Right:** July-August-September 2023 forecast rainfall anomaly. Image from the [National Meteorological Service of Argentina](#).

Southeast Asia Outlook

Below-average rainfall and above-average temperatures impacted northern areas during the past several months. April 1st to June 25th rainfall was [historically very low](#)—around half of what is typical for these months—in northern and southwestern Thailand and southern Myanmar (Figure 1 left). In many areas, daytime highs frequently exceeded 35 degrees Celsius, and temperatures in northern Thailand and northern-central Myanmar exceeded 38 degrees Celsius for more than 20 days (Figure 1 middle-left). Such high temperatures are capable of damaging crops, especially in combination with ongoing dry conditions such as in northern Thailand. Thailand's rice harvests tend to be below-average during El Niño years.

During July to September (JAS) 2023, multi-model ensemble seasonal forecasts strongly agree that regional temperatures will likely be warmer-than-normal (Figure 1 middle-right). For JAS 2023 rainfall, WMO, C3S, and NMME forecasts generally all indicate a pattern of above-normal rainfall in the north and below-normal rainfall in the south (Figure 1 right). There is notably low confidence in the JAS rainfall outlook in areas farther in the north, due to model disagreement. During June 29th to July 13th, above-average rainfall is likely in southern areas, based on the two-week unbiased GEFS forecast from June 29th. Below-average rainfall is forecast in some northern deficit areas, including central and northern portions of Thailand, Laos, and Vietnam, as well as in central Myanmar.

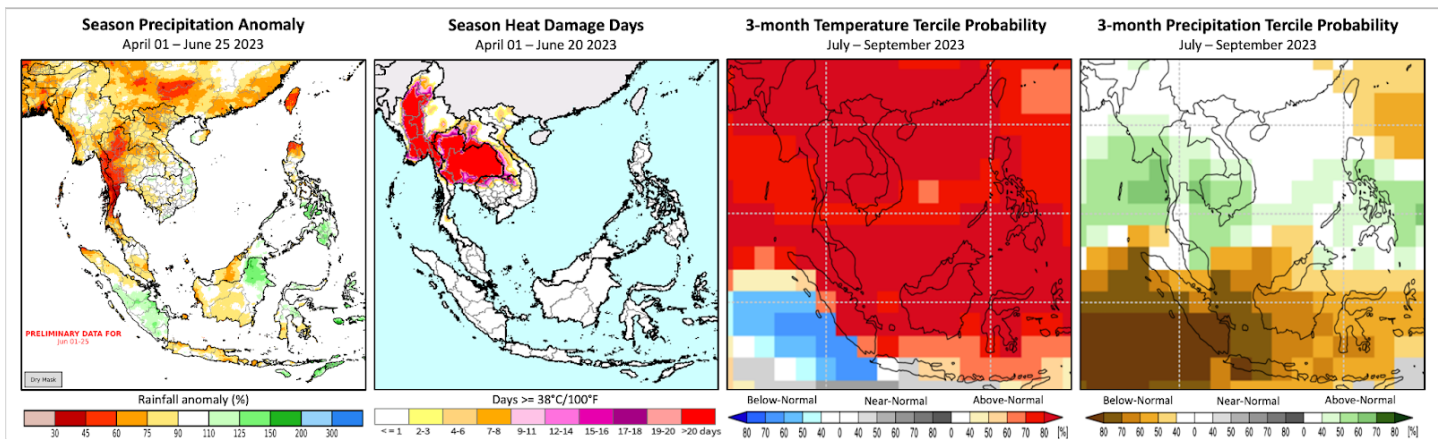


Figure 1. A seasonal rainfall anomaly, seasonal heat damage days, and 3-month probabilistic forecasts for 2m temperature and precipitation. The left panel is a CHC Early Estimate, which compares current precipitation totals to the 1981-2022 CHIRPS average for respective accumulation periods. It shows the percent of average precipitation for April 1st to June 25th, 2023, using CHIRPS Prelim for June 1st to 25th. The middle-left panel shows the number of days this season, from April 1st to June 20th, in which the daily temperature max exceeded 38°C/100°F. Based on NOAA CPC data. Image from the [USDA FAS Crop Explorer](#). The middle-right and right panels are WMO probabilistic forecasts for July to September 2023 2m temperature and precipitation, respectively, based on models initialized in June. These images are from the [WMO Lead Centre Long-Range Forecast Multi-Model Ensemble](#).

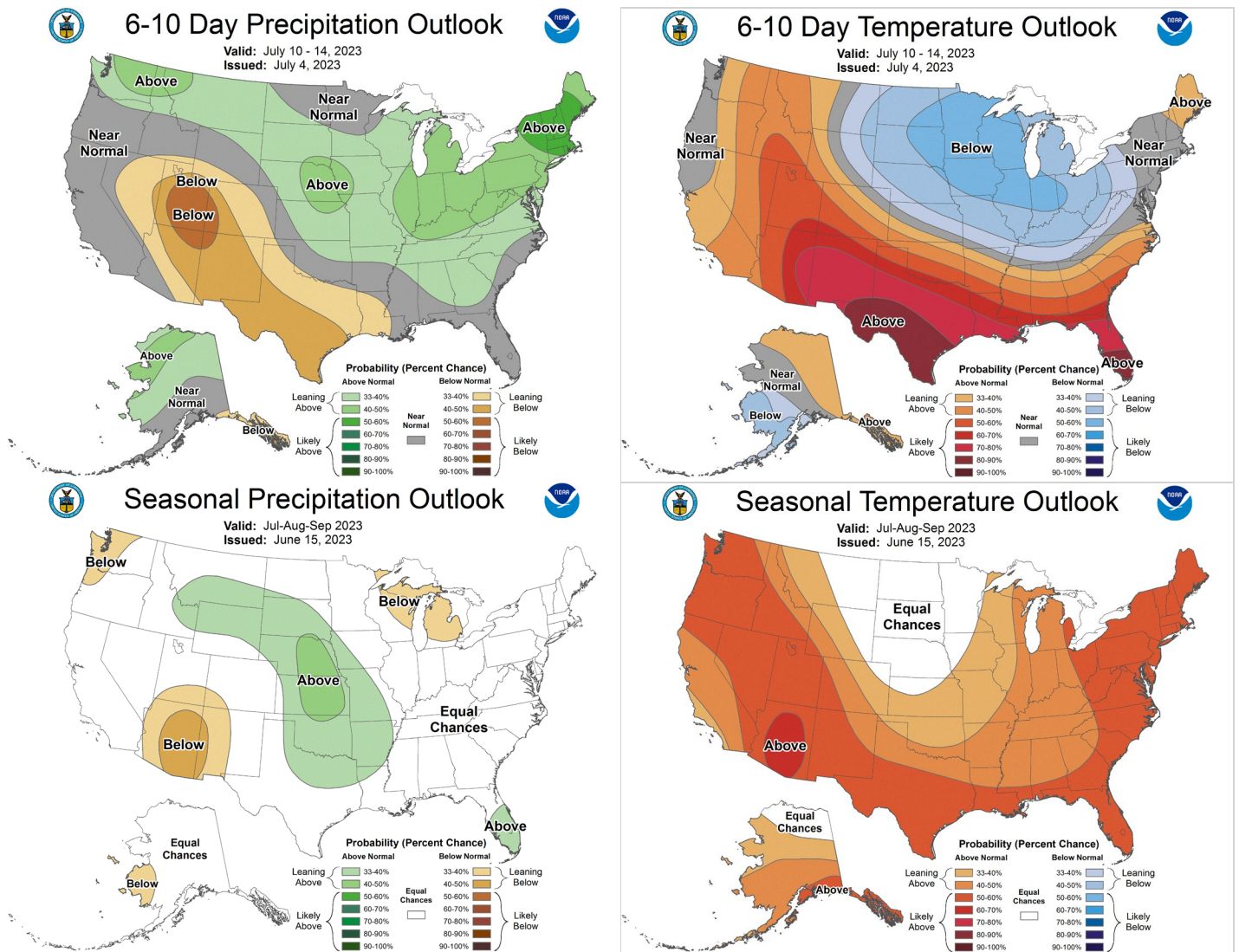
Source: UCSB Climate Hazards Center

United States Outlook

The 10 – 14 July 2023 outlook indicates there is likely above-average precipitation across the Pacific Northwest, central Great Plains, Mid-West, and New England, while likely below-average precipitation over the Southwest and southern Texas. During the same time, temperatures are likely to be above-average across the southern part of the country and stretching up the Rocky Mountains, while likely below-average temperatures across the northern Great Plains and the Mid-West.

For the long-term seasonal July-August-September (JAS) 2023 outlook, there is a leaning toward above-average precipitation over the central Great Plains, while leaning toward below-average Michigan and the Southwest. During the same period, temperatures are likely to be above-average across most of the country except for the northern Great Plains, where there are equal chances of above and below-average temperatures.

Short-term and Seasonal Outlooks



Upper Left: 6 - 10 precipitation outlook issued on 30 June 2023. **Upper Right:** 6 - 10 precipitation outlook issued on 30 June 2023. **Lower Left:** Extended June-July-August precipitation outlook issued on 18 June 2023. **Lower Right:** Extended June-July-August temperature outlook issued on 18 June 2023. Maps from NOAA/National Weather Service, National Centers for Environmental Predictions, and Climate Prediction Center <https://www.cpc.ncep.noaa.gov/products/forecasts/>.

Source: NOAA Climate Prediction Center

* Assessment based on information as of July 28th

Appendix 1: Terminology & Definitions

Crop Conditions:

Exceptional: Conditions are much better than average* at the time of reporting. This label is only used during the grain-filling through harvest stages.

Favourable: Conditions range from slightly lower to slightly better than average* at reporting time.

Watch: Conditions are close to average* but there is a potential risk to final production. The crop can still recover to average or near average conditions if the ground situation improves. This label is only used during the planting-early vegetative and the vegetative-reproductive stages.

Poor: Crop conditions are well below average*. Crop yields are likely to be more than 5% below average. This is only used when conditions are not likely to be able to recover, and an impact on production is likely.

Out of Season: Crops are not currently planted or in development during this time.

No Data: No reliable source of data is available at this time.

*" Average" refers to the average conditions over the past 5 years.

Conditions:

	Exceptional
	Favourable
	Watch
	Poor
	Out-of-Season
	No Data

Drivers:

These represent the key climatic drivers that are having an impact on crop condition status. They result in production impacts and can function as either positive or negative drivers of crop conditions.

Wet: Wetter than average (includes water logging and floods).

Dry: Drier than average.

Hot: Hotter than average.

Cool: Cooler than average or risk of frost damage.

Extreme Events: Catch-all for all other climate risks (i.e., hurricane, typhoon, frost, hail, winter kill, wind damage, etc.). When this category is used, the analyst will also specify the type of extreme event in the text.

Delayed-Onset: Late start of the season.

	Wet
	Dry
	Hot
	Cool
	Extreme Event
	Delayed-Onset

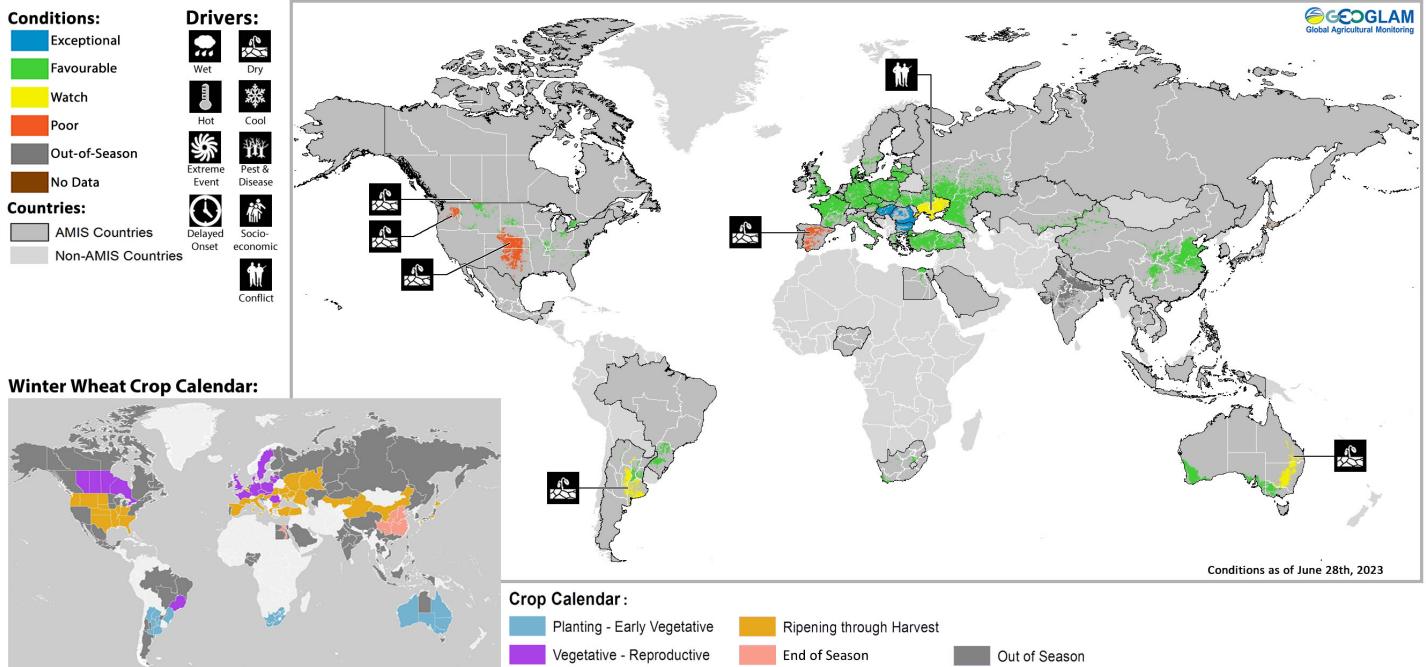
Crop Season Nomenclature:

In countries that contain multiple cropping seasons for the same crop, the following chart identifies the national season name associated with each crop season within the Crop Monitor. Within the Crop Monitor for AMIS countries, the larger producing season (most recent 5 years) has been assigned to the first season.

Crop Season Nomenclature				
Country	Crop	Season 1 Name	Season 2 Name	Season 3 Name
Argentina	Soybean	Spring-planted	Summer-planted	
Brazil	Maize	Summer-planted (larger producing season)	Spring-planted (smaller producing season)	
Canada	Wheat	Winter-planted	Spring-planted	
China	Maize	Spring-planted	Summer-planted	
China	Rice	Single-season	Late-season	Early-season
China	Wheat	Winter-planted	Spring-planted	
Egypt	Rice	Summer-planted	Nili season (Nile Flood)	
India	Maize	Kharif	Rabi	
India	Rice	Kharif	Rabi	
Indonesia	Rice	Wet-season	Dry-season	
Mexico	Maize	Spring-planted	Autumn-planted	
Nigeria	Maize	Main-season	Short-season	
Nigeria	Rice	Main-season	Off-season	
Philippines	Rice	Wet-season	Dry-season	
Russian Federation	Wheat	Winter-planted	Spring-planted	
Thailand	Rice	Wet-season	Dry-season	
United States	Wheat	Winter-planted	Spring-planted	
Viet Nam	Rice	Wet-season	Dry-season	

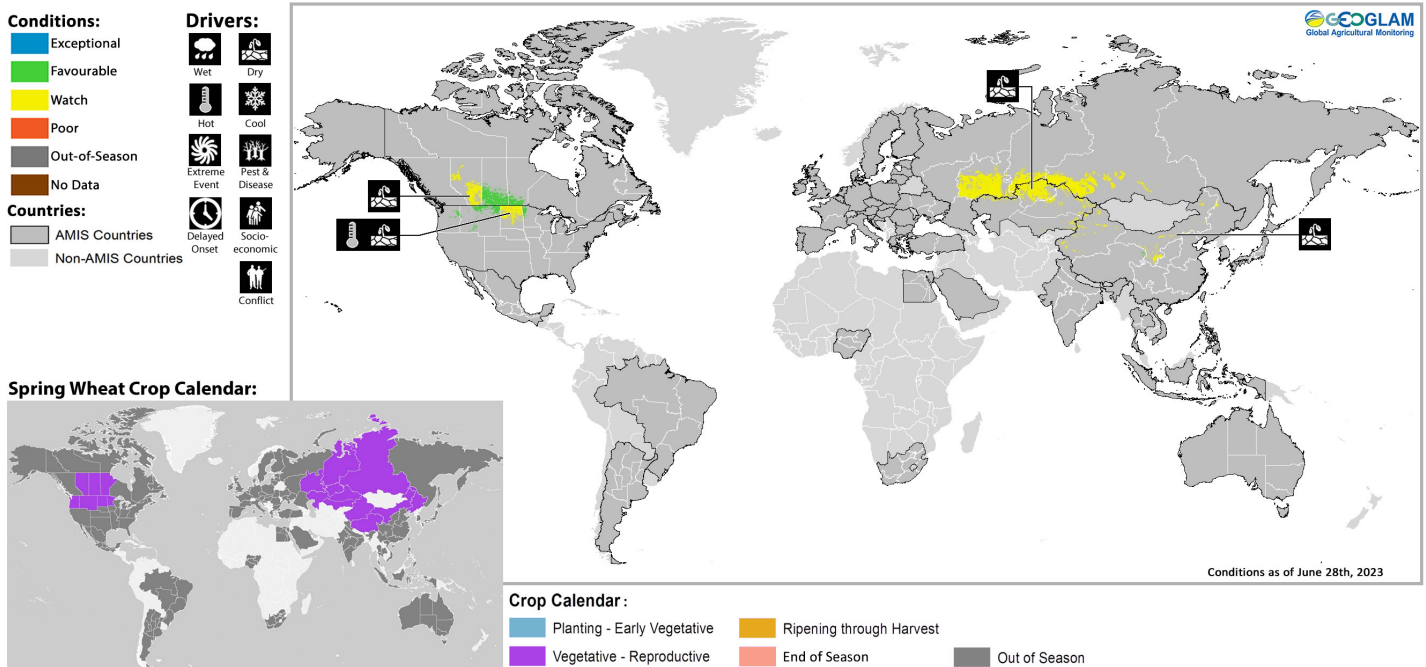
Appendix 2: Crop Season-Specific Maps

Winter Planted Wheat Conditions for AMIS Countries



Winter wheat crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs along with earth observation data. Crop condition information is based upon information as of June 28th. Where crops are in less than favourable conditions the climatic drivers responsible for those conditions are displayed. The crop calendar is provided as a point of reference to provide information on what part of the life cycle the crops are currently in for each area.

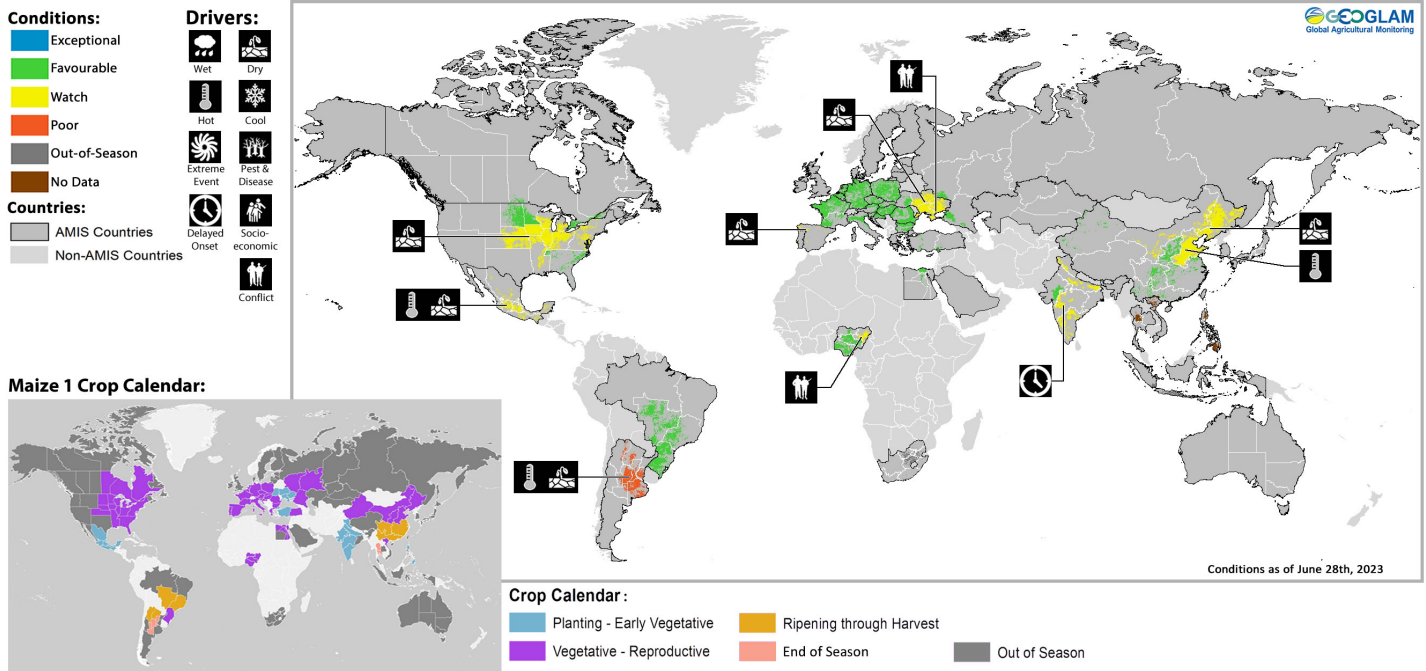
Spring Planted Wheat Conditions for AMIS Countries



Spring wheat crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs along with earth observation data. Crop condition information is based upon information as of June 28th. Where crops are in less than favourable conditions the climatic drivers responsible for those conditions are displayed. The crop calendar is provided as a point of reference to provide information on what part of the life cycle the crops are currently in for each area.

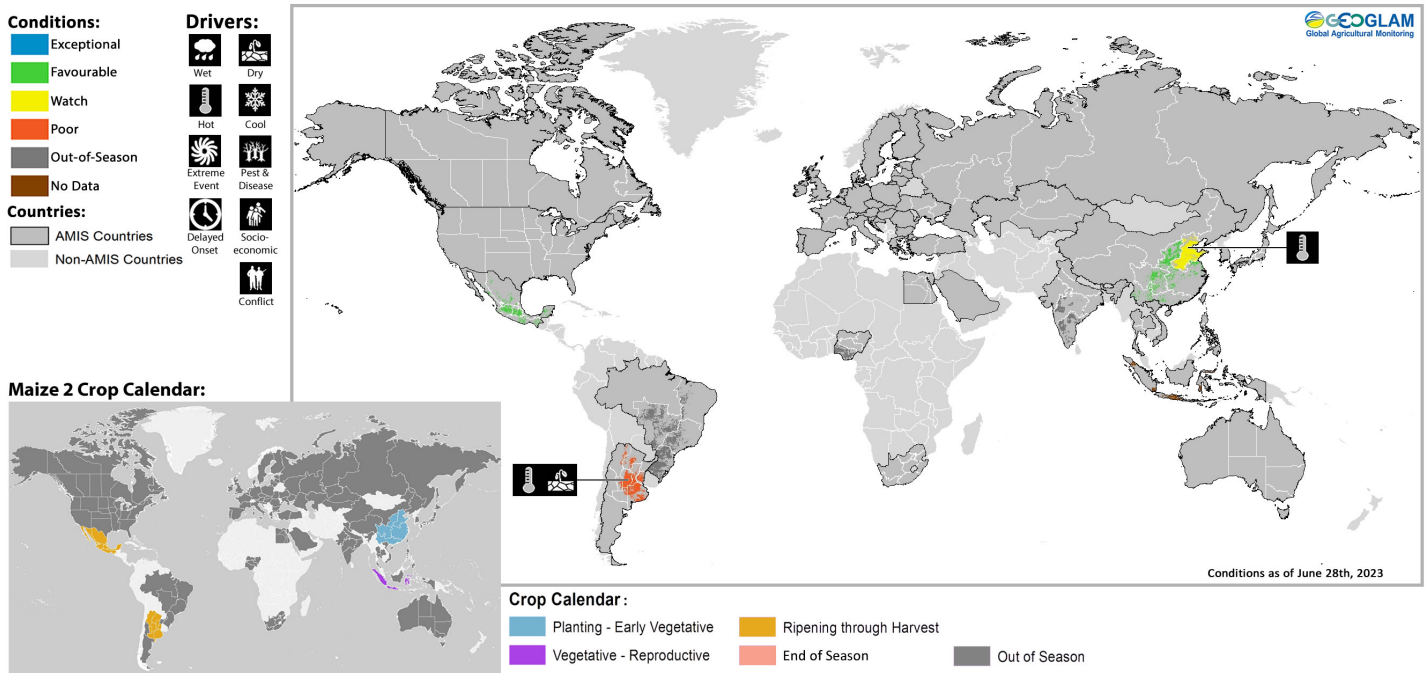
* Assessment based on information as of July 28th

Maize 1 Conditions for AMIS Countries



Maize 1 crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs along with earth observation data. Crop condition information is based upon information as of June 28th. Where crops are in less than favourable conditions the climatic drivers responsible for those conditions are displayed. The crop calendar is provided as a point of reference to provide information on what part of the life cycle the crops are currently in for each area.

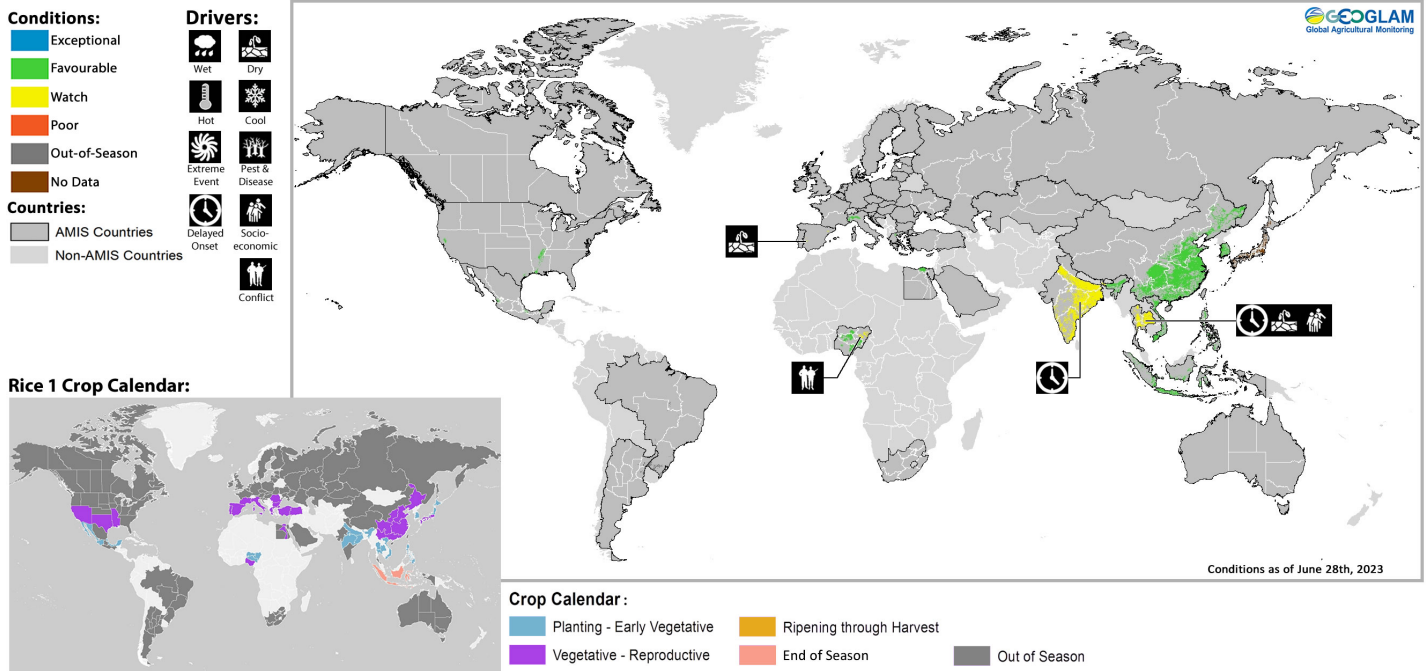
Maize 2 Conditions for AMIS Countries



Maize 2 crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs along with earth observation data. Crop condition information is based upon information as of June 28th. Where crops are in less than favourable conditions the climatic drivers responsible for those conditions are displayed. The crop calendar is provided as a point of reference to provide information on what part of the life cycle the crops are currently in for each area.

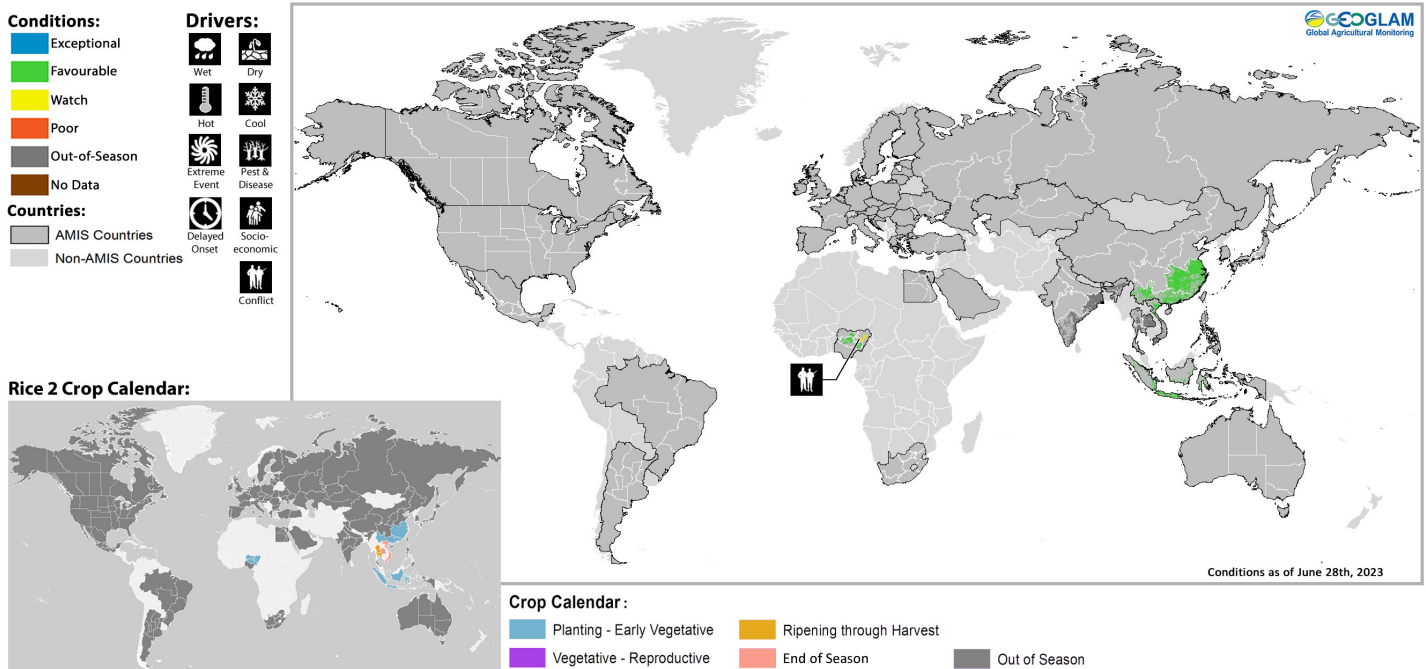
* Assessment based on information as of July 28th

Rice 1 Conditions for AMIS Countries



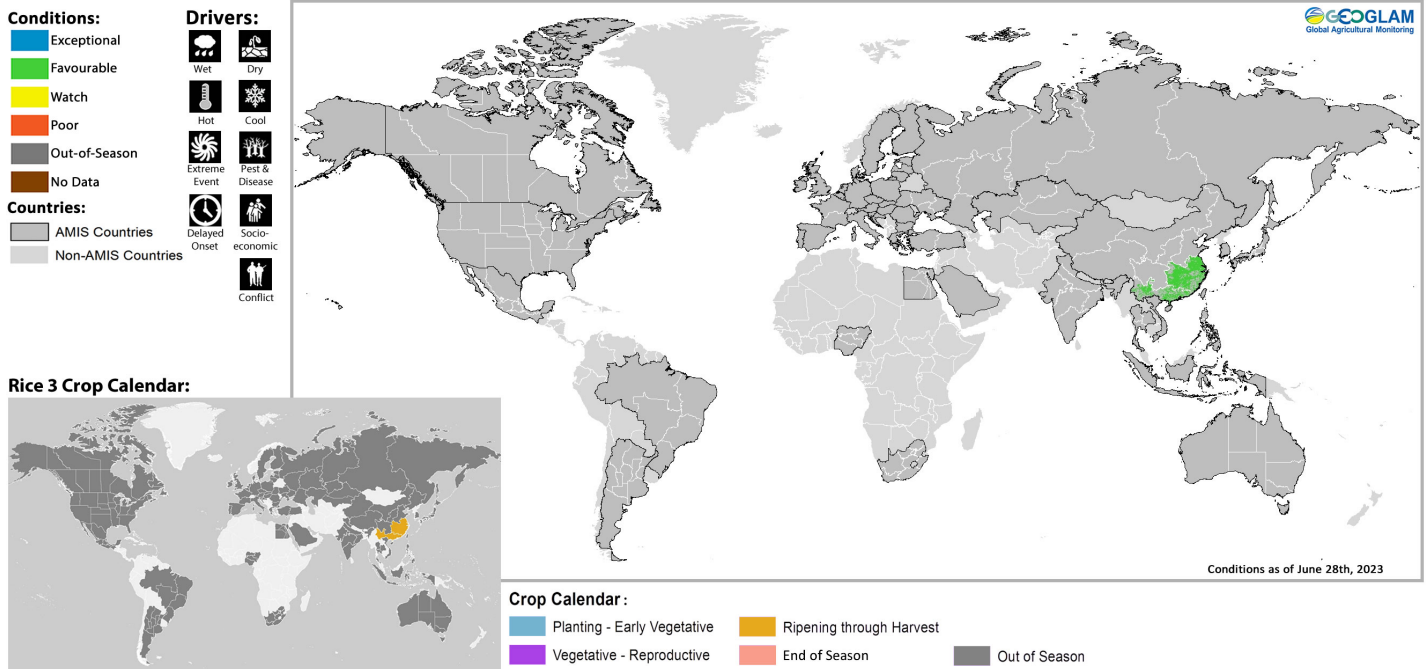
Rice 1 crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs along with earth observation data. Crop condition information is based upon information as of June 28th. Where crops are in less than favourable conditions the climatic drivers responsible for those conditions are displayed. The crop calendar is provided as a point of reference to provide information on what part of the life cycle the crops are currently in for each area.

Rice 2 Conditions for AMIS Countries



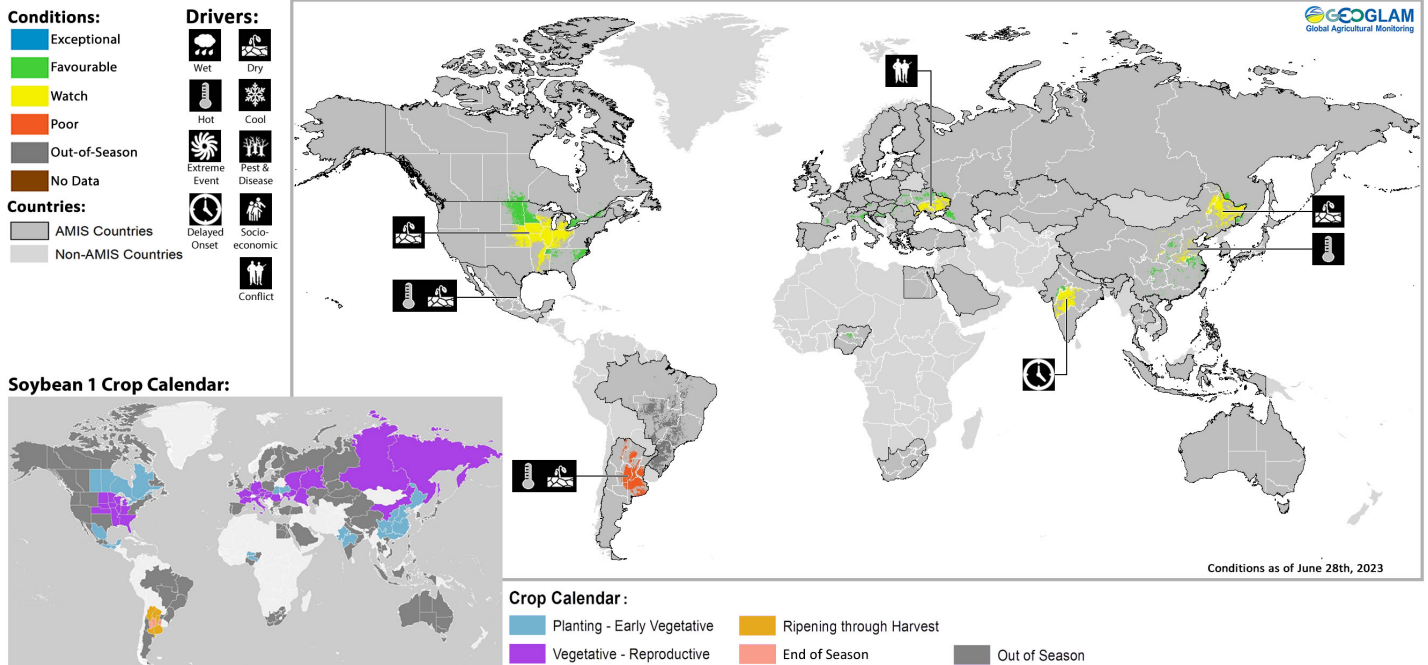
Rice 2 crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs along with earth observation data. Crop condition information is based upon information as of June 28th. Where crops are in less than favourable conditions the climatic drivers responsible for those conditions are displayed. The crop calendar is provided as a point of reference to provide information on what part of the life cycle the crops are currently in for each area.

Rice 3 Conditions for AMIS Countries



Rice 3 crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs along with earth observation data. Crop condition information is based upon information as of June 28th. Where crops are in less than favourable conditions the climatic drivers responsible for those conditions are displayed. The crop calendar is provided as a point of reference to provide information on what part of the life cycle the crops are currently in for each area.

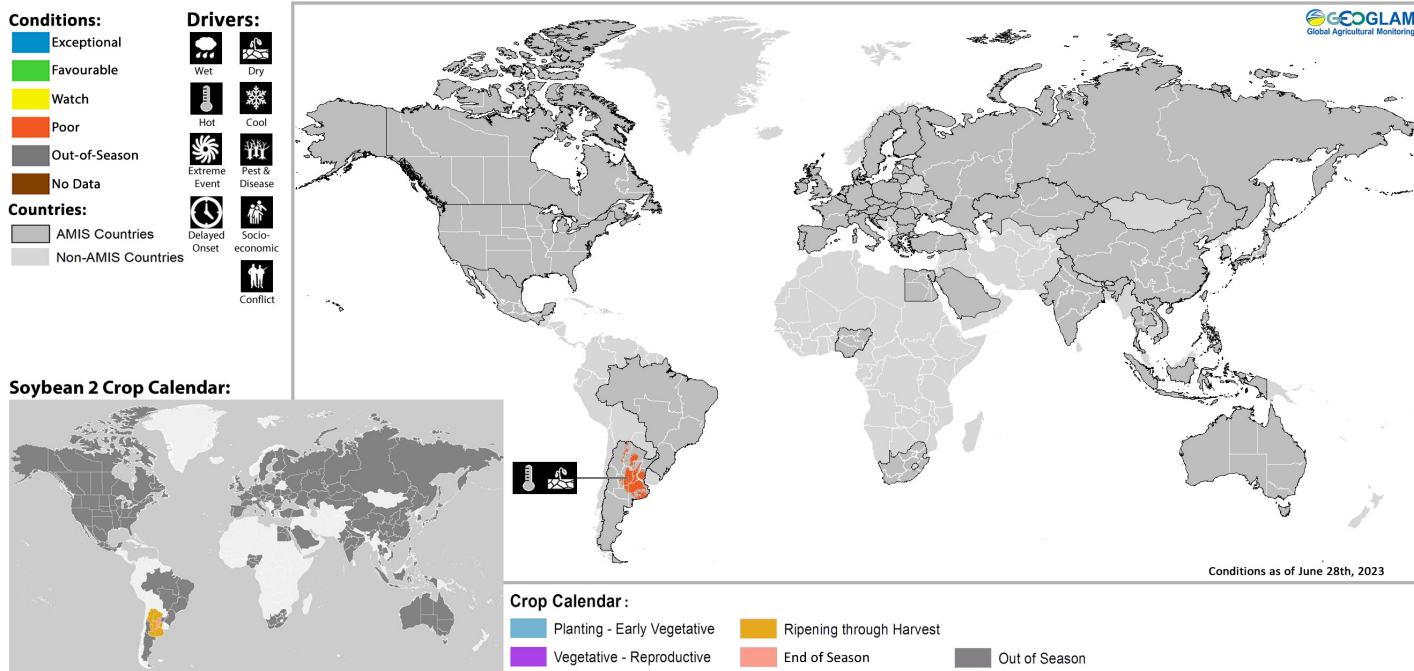
Soybean 1 Conditions for AMIS Countries



Soybean 1 crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs along with earth observation data. Crop condition information is based upon information as of June 28th. Where crops are in less than favourable conditions the climatic drivers responsible for those conditions are displayed. The crop calendar is provided as a point of reference to provide information on what part of the life cycle the crops are currently in for each area.

* Assessment based on information as of July 28th

Soybean 2 Conditions for AMIS Countries



Soybean 2 crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs along with earth observation data. Crop condition information is based upon information as of June 28th. Where crops are in less than favourable conditions the climatic drivers responsible for those conditions are displayed. The crop calendar is provided as a point of reference to provide information on what part of the life cycle the crops are currently in for each area.

* Assessment based on information as of July 28th



Prepared by members of the GEOGLAM Community of Practice
Coordinated by the University of Maryland with funding from NASA Harvest
Climatic Influences by Climate Hazards Center of UC Santa Barbara

The Crop Monitor is a part of GEOGLAM, a GEO global initiative.

Photo courtesy of Brian Barker

<https://cropmonitor.org/>

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