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CropWatch Online Resources: This bulletin along with additional resources is also available on the CropWatch Website at http://www.cropwatch.com.cn.

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Note: CropWatch resources, background materials and additional data are available online at www.cropwatch.com.cn.

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Abbreviations

5YA	Five-year average, the average for the four-month period for July from 2013 to 2017 to October; one of the standard reference periods.
15YA	Fifteen-year average, the average for the four-month period from July from 2013 to 2017 to October; one of the standard reference periods and typically referred to as “average”.
AEZ	Agro-Ecological Zone
BIOMSS	CropWatch agroclimatic indicator for biomass production potential
BOM	Australian Bureau of Meteorology
CALF	Cropped Arable Land Fraction
CAS	Chinese Academy of Sciences
CWAI	CropWatch Agroclimatic Indicator
CWSU	CropWatch Spatial Units
DM	Dry matter
EC/JRC	European Commission Joint Research Centre
ENSO	El Niño Southern Oscillation
FAO	Food and Agriculture Organization of the United Nations
GAUL	Global Administrative Units Layer
GVG	GPS, Video, and GIS data
ha	hectare
kcal	kilocalorie
MPZ	Major Production Zone
MRU	Monitoring and Reporting Unit
NDVI	Normalized Difference Vegetation Index
OISST	Optimum Interpolation Sea Surface Temperature
PAR	Photosynthetically active radiation
PET	Potential Evapotranspiration
RADI	CAS Institute of Remote Sensing and Digital Earth
RADPAR	CropWatch PAR agroclimatic indicator
RAIN	CropWatch rainfall agroclimatic indicator
SOI	Southern Oscillation Index
TEMP	CropWatch air temperature agroclimatic indicator
Ton	Thousand kilograms
VCIx	CropWatch maximum Vegetation Condition Index
VHI	CropWatch Vegetation Health Index
VHIn	CropWatch minimum Vegetation Health Index
W/m^2	Watt per square meter

Bulletin overview and reporting period

This CropWatch bulletin presents a global overview of crop stage and condition between July and October 2018, a period referred to in this bulletin as the JASO (July, August, September and October) period or just the "reporting period." The bulletin is the 111th such publication issued by the CropWatch group at the Institute of Remote Sensing and Digital Earth (RADI) at the Chinese Academy of Sciences, Beijing.

CropWatch indicators

CropWatch analyses are based mostly on several standard as well as new ground-based and remote sensing indicators, following a hierarchical approach.

In parallel to an increasing spatial precision of the analyses, indicators become more focused on agriculture as the analyses zoom in to smaller spatial units. CropWatch uses two sets of indicators: (i) agroclimatic indicators—RAIN, TEMP, RADPAR, and potential BIOMSS, which describe weather factors and its impacts on crops; and (ii) agronomic indicators—VHIn, CALF, and VCIx, Cropping Intensity, and vegetation indices, describing crop condition and development. Importantly, the indicators RAIN, TEMP, RADPAR, and BIOMSS do not directly describe the weather variables rain, temperature, radiation, or biomass, but rather they are spatial averages over agricultural areas, which are weighted according to the local crop production potential. (ii) PAY indicators: planted area, yield and production.

For each reporting period, the bulletin reports on the departures for all seven indicators, which (with the exception of TEMP) are expressed in relative terms as a percentage change compared to the average value for that indicator for the last five or fifteen years (depending on the indicator).For more details on the CropWatch indicators and spatial units used for the analysis, please see the quick reference guide in Annex C, as well as online resources and publications posted at www.cropwatch.com.cn.

CropWatch analysis and indicators

The analyses cover large global zones; major producing countries of maize, rice, wheat, and soybean; and detailed assessments for Chinese regions, 41 major agricultural countries, and 190 Agro-Ecological Zones (AEZs).

This bulletin is organized as follows:

Chapter	Spatial coverage	Key indicators
Chapter 1	World, using Monitoring and Reporting Units (MRU), 65 large, agro-ecologically homogeneous units covering the globe	RAIN, TEMP, RADPAR, BIOMSS
Chapter 2	Major Production Zones (MPZ), six regions that contribute most to global food production	As above, plus CALF, VCIx, and VHIn
Chapter 3	41 key countries (main producers and exporters) and 190 AEZs	As above plus NDVI and GVG survey
Chapter 4	China and regions	As above plus high resolution images; information on pests and diseases; and food import/export outlook
Chapter 5	Production outlook, a focus on the perspectives in Mediterranean Agriculture, updates on disaster events and El Niño, and Pests and diseases for winter wheat in north Hemisphere.	

Regular updates and online resources

The bulletin is released quarterly in both English and Chinese. E-mail cropwatch@radi.ac.cn to sign up for the mailing list or visit CropWatch online at www.cropwatch.com.cn.

Executive summary

The current CropWatch bulletin describes world-wide crop condition and food production as appraised by data up to the end of October 2018. It is prepared by an international team coordinated by the Chinese Academy of Sciences.

The assessment is based mainly on remotely sensed data. It covers prevailing weather conditions, including extreme factors, at different spatial scales, starting with global patterns in Chapter 1. Chapter 2 focuses on agro-climatic and agronomic conditions in major production zones in all continents. Chapter 3 covers the major agricultural countries that, together, make up at least 80% of production and exports (the "core countries") while chapter 4 zooms into China. Special attention is paid to the major producers of maize, rice, wheat, and soybean. The bulletin then presents a global production estimate for crops harvested throughout 2018 (Chapter 5.1), revised from our second estimate published in August.

The bulletin is issued at a time when virtually all 2018 crops have been harvested in the temperate northern hemisphere, while in many tropical areas in both hemispheres rice crops are growing (to be harvested in early 2019) or are close to harvest. In the southern hemisphere the summer season/monsoon season is ongoing.

Agro-climatic conditions (Chapter 1)

Global agroclimatic conditions are assessed based on CropWatch Agroclimatic Indices (CWAIs) which describe weather and climate over agricultural areas only. They are referred to as RAIN, TEMP and RADPAR and expressed in the same units as the corresponding climatological variables (rainfall, temperature and photosynthetically active radiation). BIOMSS is an estimate of the plant biomass production potential.

The current monitoring period from July to October 2018 recorded RAIN 10% above the average of the previous 15 years. Some semi-arid areas benefit most from the increase through favorable rangeland development in areas where pastoralism prevails (figure below, classes F to H). On a continental basis, the increase was largest in central Asia (+33%) and in Africa and North America (both at +19%). This continent-wide anomaly has been present for the last two years and is compatible with climate change scenarios.

In relative terms, RAIN was lowest in Oceania (-33%) and in Europe (-7%). Europe (from Spain to the Ural Mountains and the Caucasus) had the largest TEMP and RADPAR anomalies (+0.8°C and +5%, respectively), which water-stressed summer crops. The area is included in clusters B, C and D. In addition to Oceania (-11%), the largest BIOMSS drops occurred in southern and eastern Asia (-12% and -7%, respectively) due to cool weather. Central Asia (+22%) and Latin America (+19%) had the largest BIOMSS increases.

Acutely abnormal weather conditions are described in Chapter 5. They include Central American droughts and floods in southern Asia (Kerala) and in Nigeria. Tropical cyclone activity was relatively calm except for typhoon Mangkut in the Philippines and two North American hurricanes (Florence and Michael).

Global Agricultural production estimates (Chapter 5.1)

This is the third estimate issued by the CropWatch team for 2018 production of the major commodities. About 90% of the production is actually modeled and about 10% is trend-based. Most of the production variability can be directly assigned to weather conditions described above.

The volumes produced in 2018 include 999 million tons of maize, down 1.1% from 2017, 721 millions for rice (down 1.8%), 723 million tons of wheat (with a 0.9% decrease below 2017 output) and 327 million tons of soybeans, just 0.1% over 2017. The major or "core" producers contribute 916 million tons of maize (-1.1%), 658 millions for rice (-1.9%), 648 million tons of wheat (a 0.9% drop) and 307 million tons of soybeans (up 0.3% above 2017 output).

For the current 2018 season, global output was below 5-year trend values, which is clearly the result of unfavorable conditions in several major producers.
For maize, China, the second largest producer, did well as production increased 1.4%, equivalent to 2649 thousand tons. The major global producer, the United States experienced a drop of 2.1%, or about 8 million tons. Among the other major producers, very few did well; they include Brazil (+1.8%), Nigeria (+5.3%) and Romania (+7,5%). Drops occurred in Ukraine (-7.8%), South Africa (-6.9%), Argentina (-6.2%), India (-5,8%), Indonesia (-4.9%) and France (-1.5%). The production of the top exporters is down about 2%, which corresponds to about 20 million tons.
With few exceptions, all major Asian rice producers recorded drops in production in 2018 compared with the previous season. This includes essentially China (-1.6%), India (-2.1%) and Indonesia (-4.7%). In Thailand, the second largest exporter on par with India, did relatively well with a drop of 0.5%. Among the non-Asian exporters, both the United States and Brazil increased their output (+1.0% and +2.2%, respectively). The Production of the top ten rice exporters is down 1.7% (equivalent to about 5 million tons).
Among the major producers Australia's estimated production of wheat for 2018 is down by a very significant 12.8%, followed by Russia (-10.3%) and Ukraine (-7.1%). The overall wheat production drop was contributed to by almost all major wheat producing countries in Europe (Poland, the United Kingdom, France, Germany, all down by more than 4%), south America (Argentina -4.4%, Brazil -3.8%) and north America (United States -3.9%). In comparison, the large Asian countries did relatively well with India at -2.3% and China at just -0.1%.
Soybean importers did particularly well in 2018, increasing output by about 3%, which results from the reversal of the negative production trend in China (now at +2.1%). Other countries with production increases include Canada (+0.4%), Brazil (+1.2%), United States (+2.8%) and Russia (+3.9%). India is down, and so is a major exporter, Argentina (-7.6%).

China (Chapter 4)
The total 2018 annual crop production is estimated at 579.1 million tons; down 0.1% from 2017 (397 thousand tons decrease). The output of summer crops (including maize, single rice, late rice, spring wheat, soybean, minor cereals, and tubers) at 418.8 million tons, the same level as 2017. A remarkable feature is the poor performance of Shandong province with all crops (winter wheat, maize, soybean, or total winter crops and summer crops) producing less than during 2017.

Maize production is 1.4% over 2017. As a result of the suppression of maize price subsidization three years ago, the planted area continued to decrease but only marginally so (-0.2%) compared to 2017. The most significant increase of maize production was observed in the semi-arid Loess Region, including Gansu (+8%), Shaanxi (5%), and Shanxi (7%). The main maize producing province – Heilongjiang – also produced 4% more maize compared to 2017. Maize production of most other provinces remained stable or dropped since 2017.
Compared with 2017 rice is down 1.6%, due to the decrease in planted area and yield. The largest drop of single rice production was observed in Ningxia province (-15%) which contributes only little to the total output. Top producers such as Heilongjiang, Hunan and Sichuan slightly increased production compared to 2017. A large drop for single rice production was observed in Chongqing, Jiangsu and Hubei. Late rice production remains at the same level as 2017 but the relative share of provinces changed, with drops in Anhui (4%), Guangxi (6%), Jiangsu (9%) and Zhejiang (4%).
Wheat production stays at the same level as 2017 with 122 million tons.
At 14 million tons, soybean production is up 2.1% due to 1.5% increase in yield and 0.6% increase of planted area. The production is the highest level since 2012. Among the major producing provinces, Anhui, Jiangsu, Liaoning and Shandong reduced outputs compared to 2017 while the two top producers (Heilongjiang and Inner Mongolia), were 2% and 4% above 2017, respectively.