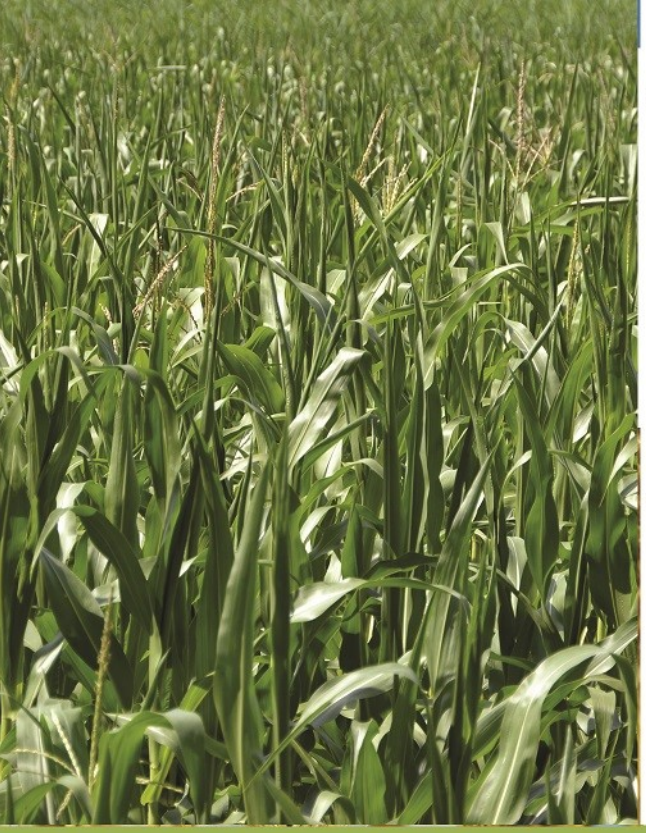

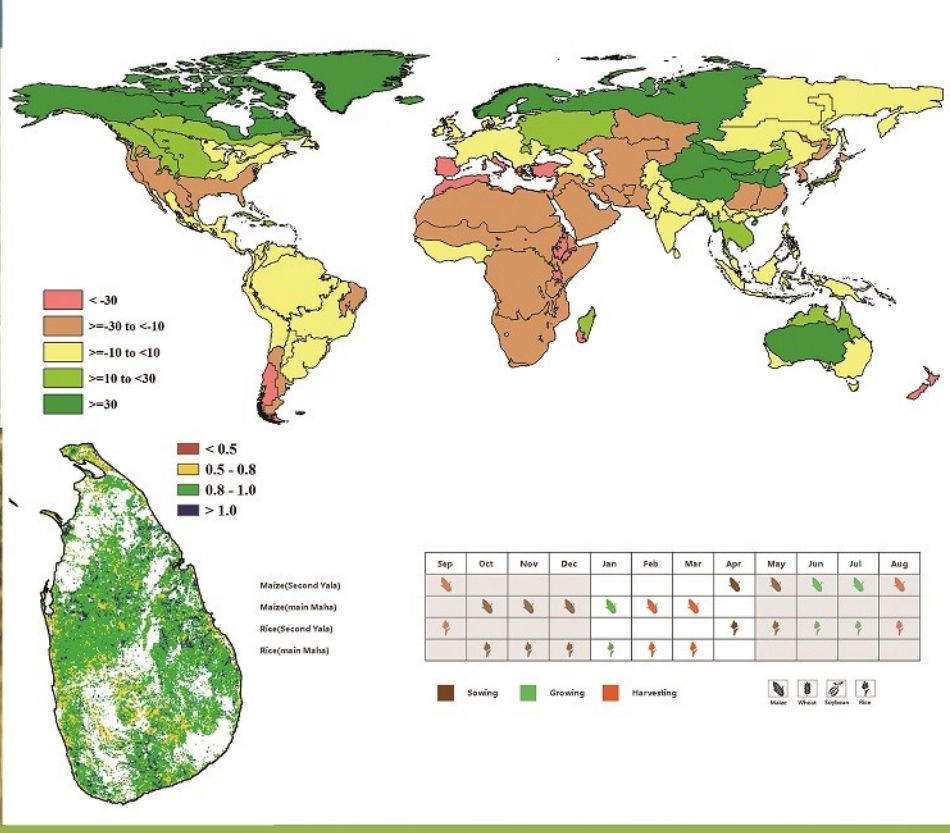

CropWatch bulletin

QUARTERLY REPORT ON GLOBAL CROP PRODUCTION

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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 January from 2013 to 2017 to April next year; one of the standard reference periods.
15YA	Fifteen-year average, the average for the four-month period from January from 2013 to 2017 to April next year; 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 January and April 2018, a period referred to in this bulletin as the JFMA (January, February, March and April) period or just the "reporting period." The bulletin is the 109th 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 analyses and indicators

CropWatch analyses are based mostly on several standard as well as new ground-based and remote sensing indicators, following a hierarchical approach. 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 which include 30 countries in previous bulletins and 11 newly increased countries (Afghanistan, Angola, Belarus, Hungary, Italy, Kenya, Sri Lanka, Morocco, Mongolia, Mozambique, Zambia), and 148 Agro-Ecological Zones (AEZs) for those 30 key countries (no sub-national regions are for these newly increased 11 countries in this bulletin). 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, and RADPAR, which describe weather factors; and (ii) agronomic indicators—BIOMSS, VHIn, CALF, and VCIx, 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. 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.

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 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, and updates on disaster events and El Niño.	

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

Introduction

This quarterly CropWatch bulletin is based mainly on current remote sensing inputs in addition to detailed and spatially accurate reference data about crops and their management. The scope is global and comprehensive.

The bulletin focuses on crops that were either growing or harvested between January and April 2018. It covers prevailing weather conditions, including extreme factors, as well as crop condition and size of cultivated areas, paying special attention to the major worldwide producers. The bulletin also describes the current crop situation globally - including detailed analyses for China - and presents a first quantitative estimate for crops to be harvested throughout 2018. The estimate is based on partial data and will be updated in the next two CropWatch 2018 bulletins as more countries reach harvest.

The current CropWatch bulletin is prepared jointly by several institutes of the Chinese Academy of Sciences (CAS) under the overall coordination of the Digital Agriculture Division of the Institute of Remote Sensing and Digital Earth (RADI). Several changes were introduced in this issue: 11 countries were added to improve the focus on Africa and Asia, which brings to total from 30 + 1 (China) to 41 +1, including at least 80% of production of the three main cereals (maize, rice, wheat) and soybean. Another new section covers major wheat pests in seven northern hemisphere countries where wheat development is currently in full swing after the end of the cold season dormancy.

Global agroclimatic conditions

Global agroclimatic conditions are monitored using CropWatch agroclimatic indices which are spatial averages over agricultural land only, giving more weight to areas with a large production potential. The indices are referred to as RAIN, TEMP, RADPAR for solar radiation and BIOMSS for the biomass production potential.

At the global scale, RAIN was 8% above the average value of the 15-year reference period (2003-2017). TEMP was average (-0.1°C) while RADPAR was well below average (-5%) in the majority of land areas. Above average RAIN and lower than average RADPAR are the continuation of a pattern that started one year ago and which is bound to negatively affect photosynthesis. Eight Indian States and Bangladesh had a sunshine deficits in excess of 10%. Low sunshine was one of the major and largest global features of the reporting period.

Another dominant and continent-wide feature was cooler than average Equatorial and tropical areas. A more intense cold wave hit western Russia and Kazakhstan extending as far west as Morocco, while a serious heatwave area centred around Iran occurred in late March and early April, extending from Syria to North India while Areas of drought (RAIN values below average) include parts of central, south and east Asia and surrounding areas (-49% in Indian Punjab, -16% in Pakistan, -24% in Yunnan, -23% in Fujian), parts of southern Africa (Malawi -22%, Swaziland -16%) and the Mediterranean (Montenegro -32%, Tunisia -50%), some major agricultural areas centred around north Argentina (-41% in the provinces of the Pampas and Entre Rios) as well as parts of north America including some major wheat producing areas (Manitoba -23%, Oregon -22%, Nebraska -27%, Kansas -58%). For Canada and for the USA as a whole, the percent decrease in cropped area was significant at the end of April: -49% and -25%, respectively, as assessed by the CropWatch Cropped Arable Land Fraction (CALF) indicator. For Argentina,

Canada and the USA, the CropWatch Vegetation Condition Index (VCIx) reaches 0.66, 0.62 and 0.65 indicating average crop condition at best.

Positive rainfall anomalies are mentioned mainly for east Africa and some semi-arid areas in central and eastern Asia, the central Gulf of Guinea and the general Caribbean area including Mexico.

Production outlook

The final outcome of the 2018 season will depend on agroclimatic conditions up to the end of the year: for crops that are still growing, the listed estimates assume that environmental and phytosanitary conditions will be average between the time of reporting and harvest.

CropWatch estimates the global 2018 production of the major commodities at 1045 million tonnes of maize, up 1.8% over 2017, 745 millions for rice (up 0.6%), 697 million tonnes of wheat (a 3.2% drop below 2017) and 323 million tonnes of soybeans, virtually equivalent to 2017 (-0.1%). The share of the "minor producers" (142 countries that together contribute less than 20% of world production) has decreased by up to 5.6 percentage points (wheat); soybeans are down 1.3 percentage points illustrating the trend towards the consolidation of the position of the major producers. In terms of 2018 production change compared to 2017, major producers outperform "minor producers" for maize and rice (1.8% Vs. 1.4% and 0.6% Vs. 0.3%, respectively) while minor producers outperform the major producers for wheat (0.5% Vs. -3.5%) and especially soybean (6.4% Vs. -0.5%) as more countries are trying to join the closed club of soybean producers dominated by the USA, Argentina and Brazil and some of their south-American neighbours.

Countries that experienced large **maize production** increases include Brazil (+3.1%), one of the largest global suppliers of the crop (3rd exporter worldwide). The second largest exporter (Argentina) suffered a drop in maize output of 3.8% due to drought in the northern provinces, which affected as well adjoining areas in Uruguay and Brazil. Mixed conditions prevail in southern Africa where maize is a main staple. South Africa is an important exporter (10th worldwide) but suffered a reduced output 6.8% below last year's. Mexico had a drop in maize production of 1.8% and the Philippines are up 2.2%.

Rice suffered a generalised drop in production in South-East Asia, starting with Cambodia (-2.2%), Indonesia (-1.1%), Thailand (-5.2%) and Vietnam (-1.4%). It is not evident what caused the drop, although reduced sunshine may have played a part. Countries further to the north (Bangladesh, India, Myanmar, Philippines) increased their output by 3.2%, 2.6%, 1.5% and 3.8%, respectively.

Reductions in **wheat production** exceeding 5.0 % occurred on all continents, affecting some of the major global producers such as Canada (-13.0 %) and the United States (-13.5 %) due to unfavourable weather including poor sunshine, drought, water logging and cold waves. Other major producers such as India, Kazakhstan and Russia suffered a drop in production reaching 6.3%, 12.9% and 7.9%, respectively. It is mostly the poor performance of the large global producers of wheat that are responsible for the global drop of production mentioned above (-3.2%). Countries with positive outcomes include Iran and Turkey (respectively +6.2% and +7.9%, a welcome change in both countries after a run of bad or mixed seasons), Belarus, Poland and Romania (+9.7%, +11.9% and +6.5%, respectively), and Egypt (+7.0%) where the good rice crop comes in addition to increased maize and rice productions.

In the northern hemisphere the **soybean crop** was just planted or is still to be planted. In Argentina the soybean crop production is down (-8.2%) while, in comparison, Brazil did relatively well (+0.8%).

The analysis of the performance of major importers and exporters of cereals and soybean shows that some difficulties may arise with wheat supply if the situation does not improve in the USA and Canada as the projected production deficit of the top 10 exporters reaches just above 17 million tonnes.

China

China experienced mixed weather conditions as both rainfall and RADPAR dropped by 8% compared to average at the national scale. CALF was 14% below the average of the previous 5 years and VCIx was rather low at 0.54 indicating both reduced planting and low yield expectations. At the regional scale several northern regions had positive RAIN anomalies in excess of 30% while the Lower Yangtze and Southern China had deficits close to 20%. The highest VCIx values occur in the central part of China.

The unfavourable agro-climatic conditions resulted in a 1.4% decrease in wheat yield compared to the previous season. Winter wheat production is forecast at 112.7 million tons, a decrease of 3.3 million tons or 2.8% below 2017. CropWatch puts the total winter crop production at 122.8 million tons, a 2.8 percent decrease from the 2017's bumper production. Planted areas decreased 1% for Hebei, Jiangsu, Shandong and Henan and 2% in Sichuan. The largest increases of winter wheat hectarage was observed in the provinces of Shanxi (+3%) and Shaanxi (+5%). In addition to poor weather, wheat sheath blight and aphids were widespread: the first causes concern especially in southern China and the Lower Yangtze region where 7% or areas are severely affected; aphids occur in all regions to the extent that more than 35% of fields are infested in southern and south-west China, 10% severely so in the latter.

The largest winter wheat production inter-annual change (+11%) occurred in Shaanxi as a result of both increased planted area and yield. The top three winter wheat producing provinces (Henan, Shandong and Hebei) all suffered from unfavourable conditions and report large production drops of 2%, 6% and 2%, respectively. Hebei mainly suffered from drought while the decreased production for Shandong and Henan was mostly due to delayed crop development.