CropWatch Bulletin

QUARTERLY REPORT ON GLOBAL CROP PRODUCTION

Monitoring Period:
January - April, 2020

Volume 20, No. 2
(No. 117)

May 31st ,2020

中国科学院空天信息创新研究院
Aerospace Information Research Institute,Chinese Academy of Sciences

CropWatch

May 2020

Aerospace Information Research Institute (AIR), Chinese Academy of Sciences
P.O. Box 9718-29, Olympic Village Science Park
West Beichen Road, Chaoyang
Beijing 100101, China

This bulletin is produced by the CropWatch research team, Aerospace Information Research Institute (AIR), Chinese Academy of Sciences, under the overall guidance of Professor Bingfang Wu.

Contributors are Diego de Abelleyra (Argentina), Awetahegn Niguse Beyene(Ethiopia), Jose Bofana (Mozambique), Ganbat Bavuudorj(Mongolia), Sheng Chang, Abdelrazek Elnashar (Egypt), Yicheng Cai (Hubei, China), Li Fu, Zhijun Fu, Wenwen Gao, Zhongyuan Li (Hubei, China), Wenjun Liu, Yuming Lu, Linghua Meng (Changchun, China), Zonghan Ma, Elijah Phiri (Zambia), Elena Proudnikova (Russia), Isaev Erkin (Kyrgyzstan), Mohsen N. Ramadan (Egypt), Rukundo Emmanuel (Rwanda), Igor Savin (Russia), Urs Christoph Schulthess (CIMMYT, Netherlands), Binfeng Sun (Jiangxi, China), Shengtao Su, Meng Tang (Hubei, China), Fuyou Tian, Battestseg Tuvdendorj (Mongolia), Huanfang Wang, Linjiang Wang, Yuandong Wang (Jiangxi, China), Zhengdong Wang, Bingfang Wu, Qiang Xing, Jiaming Xu, Nana Yan, Shanlian Yang (Jiangxi, China), Hongwei Zeng, Miao Zhang, Dan Zhao, Hang Zhao, Xinfeng Zhao, Liang Zhu, Weiwei Zhu, Xiwang Zhang (Henan, China) and Qifeng Zhuang (Jiangsu, China).

Thematic contributors for this bulletin include: Fengying Nie (niefengying@sohu.com) and Xuebiao Zhang (zhangxuebiao@caas.cn) for the section on food import and export outlook for 2020.

Editor: Nana Yan

Corresponding author: Professor Bingfang Wu
Aerospace Information Research Institute, Chinese Academy of Sciences
Fax: +8610-64858721, E-mail: **cropwatch@radi.ac.cn**, **wubf@radi.ac.cn**

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

Contents

LIST OF TABLES

LIST OF FIGURES

Abbreviations

5YA	Five-year average, the average for the four-month period from January to April for 2015-2019; one of the standard reference periods.
15YA	Fifteen-year average, the average for the four-month period from January to April for 2005-2019; 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	EI 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	Mapping and Reporting Unit
NDVI	Normalized Difference Vegetation Index
OISST	Optimum Interpolation Sea Surface Temperature
PAR	Photosynthetically active radiation
PET	Potential Evapotranspiration
AIR	CAS Aerospace Information Research Institute
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 2020, 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 117th such publication issued by the CropWatch group at the Aerospace Information Research Institute (AIR) of 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. 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; and (ii) agronomic indicators—VHIn, CALF, and VCIx and vegetation indices, describing crop condition and development. (iii) 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 B, 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, 42 major agricultural countries, and 201 Agro-Ecological Zones (AEZs).

This bulletin is organized as follows:

Chapter	Spatial coverage	Key indicators
Chapter 1	World, using Mapping 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	42 key countries (main producers and exporters) and 205 AEZs	As above plus NDVI and GVG survey
Chapter 4	China and regions	As above plus high resolution images; Pest and crops trade prospects
Chapter 5	Production outlook, 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**, **http://cloud.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 April 2020. It is prepared by an international team coordinated by the Aerospace Information Research Institute, Chinese Academy of Sciences.

Special attention is paid to the major producers of maize, rice, wheat and soybean throughout the bulletin. 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. Each is the object of a detailed analysis. Chapter 3 constitutes the bulk of the Bulletin. Chapter 4 zooms into China. The bulletin also presents this year's second CropWatch production estimates for selected countries and reviews the first production estimation in chapter 5.

In the Northern Hemisphere, wheat was the dominant crop that was in the field during this period. It had reached maturity in South Asia by April and was mostly in its vegetative growth phase in the other regions. Planting of spring wheat, soybean and rice started and was in full swing in most northern regions by late April. In the Southern Hemisphere, mainly in South America, maize and soybean were the key crops to be monitored. Harvest of the first crop and subsequent sowing of the second crop in Brazil took place in February, whereas harvest of the main crop in the other South American countries was well advanced by April. Closer to the Equator, this report covers the end tail of the harvest of the main season rice crop and production of the winter rice crops (Boro/Kharif) in South and South-East Asia.

The outbreak of COVID-19 and the impact of associated lock-downs on the agri-food chain are of major concerns for the whole world. So far, the impact on food production per se may have been limited according to CropWatch monitoring results, although there are reports that limited availability of farm-hands has caused delays in labor intensive rice harvest in India and there have been shortages of harvest labor for fruit and vegetable in Europe. This pandemic is also impacting the livestock sector.

Another plague, the outbreak of desert locusts in East Africa, Middle East and southwest Asia is still not under control either. Ample rainfall keeps maintaining a favorable environment for them to spread even further. Their impact on world food supply is limited, but is devastating for the farmers in the areas that are hit by a swarm.

Agro-climatic conditions

According to the analyses presented in Chapters 1 and 3.1, prevailing climate conditions during the current 2020 JFMA reporting period were dominated by record warm temperatures. Temperatures were 1.4ºC above the previous winter record, set in 2015-16. The Ukraine and the western half of Russia experienced 3.3ºC warmer - or less cold - temperatures than the average of the last 15 years. Warmer winter temperatures generally hasten spring green-up and phenological development of winter wheat. However, warmer temperatures do not prevent late season frosts. Untimely cold snaps in the Midsouth and Midwest of the USA caused some frost damage to wheat in mid-April and early May.

At a global scale, rainfall (RAIN) returned close to average levels after the high positive deviation during the last monitoring period. Photosynthetically active solar radiation (RADPAR) was slightly below average.

The following is a summary of the situation in key production regions and noteworthy anomalies:

- South Asia: This region experienced above-average rainfall and cooler temperatures. This was beneficial for wheat growth in India and Pakistan and boro rice production in India. Especially Indian farmers benefitted from the increased availability of stored water in reservoirs for irrigation during the dry winter season. This allowed them to increase the area of cultivated land and adequately irrigate their crops.

- West of North Africa (Maghreb): Morocco and Algeria suffered from a prolonged drought which lasted until March. It caused crop failures in Southern Morocco.

- Italy, South-East Europe and Ukraine: drier than normal conditions hampered winter wheat growth.

- South-East Asia: Dry season (Kharif) rice production suffered from drought due to below-average rainfall.

- Conditions in the key maize and soybean production regions in Argentina and Brazil were generally favorable, although in some parts short drought spells were observed. Southern Brazil also suffered from drier than normal conditions, which hampered soybean production mainly in the state of Parana.

- South Africa benefitted from generally favorable conditions after a severe drought a year ago.

- Conditions for winter wheat in North America, Europe, and Middle East were generally close to normal. Europe suffered from dry conditions in March and April.

- The situation for China was generally favorable. Winter wheat received above average rainfall and a production increase by 4% is expected. Planting of rice is on track.

2020 Production estimate

The production estimate proposed in Chapter 5.1 will be updated three times this year. Except for the Southern Hemisphere, it is currently based largely on a mix of actual crop and weather data for the JFMA period and estimates for May onward. The share of actual data monitored by remote sensing varies from approximately 21% for maize (Southern Hemisphere), 36% for rice (dry season of Southeast and South Asia), 77% for wheat (most of it being Northern Hemisphere winter wheat) and 46% for soybeans (Southern Hemisphere).

CropWatch predicts the global production of the major commodities at 1057 million tonnes of maize, and 755 million tonnes for rice, bothof which are teh same as 2019. Wheat and soybean productions are projected at 737 million tonnes, and 329 million tonnes, up by 3% and 1% from 2019, respectively. The outlook for the key countries is summarized below.

Two countries stand out for large increases in maize production: Kenya (+15%) and South Africa with (+27%). A larger production (+4%) is estimated for Bangladesh. Myanmar, which was affected by dry conditions, has its production reduced by 12%. In all other countries, the estimates are close to those for the previous years, in the range from +3% to -2%. This includes Argentina (+2%) and Brazil (-2%).

For rice, production increases are forecasted for Argentina (+5%) and Thailand (+6%). Considerable reductions were calculated for Bangladesh (-5%), and drought-stricken countries in South-East Asia: Cambodia (-5%), Myanmar (-4%) and Vietnam (-3%). A reduction by 4% is expected for Brazil.

Larger year to year fluctuations were estimated for wheat, which is mostly rainfed: Afghanistan (-17%), Belarus (-11%), Kyrgyzstan (12%) and the Ukraine (-22%) are the ones with lower yields as compared to last year. On the other hand, substantial increases were calculated for: China (+4%), Egypt (+8%), Hungary (+7%), India (+14%), Mexico (+23%), Pakistan (+10%) and Russia (+6%). Production for the other countries

is expected to be close to those from last year. It is also noteworthy that the top wheat producers (China, India, Russia) all present an increased wheat production, by 4%, 14% and 6% respectively, which contribute to a 20.54 million tonnes of production increase.

This monitoring period covers soybean in two important countries only: Production for Argentina is expected to increase by 2%, whereas for Brazil, it is expected to drop by 1%, due to drier-than- usual conditions in the south of that country.

The performance of major exporters and importers does not rise any concerns for the availability of maize, rice, wheat, and soybean.

China

During the current monitoring period, winter wheat and rapeseed were still at the growing stage while spring crops including spring maize and early rice were at the planting stage.

Climatic variables and the resulting crop conditions were generally favorable in the main winter crop producing areas. Both precipitation and temperature were above average (by 19.7% and 0.8°C, respectively). The cropping season is well underway in southern and central China. According to the spatial VCIx patterns favorable crop condition occurred widely all across China. Huanghuaihai benefitted most from the above-average precipitation (RAIN +51%).

CropWatch puts the total output of winter crops for China at 132.33 million tons, up by 3% or 4.29 million tons. The total winter wheat production in 2020 is estimated to reach 122.24 million tons, an increase of 4.44 million tons or 4% from 2019. The national winter wheat area is 23,898 thousand hectares, an increase of 3% over the same period of last year. The average winter wheat yield nationally is 5115 kg/ha, up by 1% compared to 2019. The increase in total production is mainly due to the two main winter wheat producing provinces of Henan and Shandong, which further expanded the winter wheat planted area by 5% and 3%, respectively. Decreases were observed in Hebei and Shanxi, down by 2% and 1% from 2019, respectively. The reduction of winter crops planted area might be a consequence of the water-saving and sustainable groundwater management policy. It is also noteworthy that after the end of the lockdown, winter crops in Hubei recovered from unfavorable conditions in March.

The results also show that COVID-19 had limited impacts on early rice cultivation at the national level. It is expected that the area of early rice in the eight main early rice producing provinces in 2020 will increase by 2.2% compared with 2019. In 2020, the total early rice area is estimated at 5101.4 thousand hectares, an increase of 109.7 thousand hectares or 2.2% up from 2019.

So far, conditions for the 2020 cereal production have generally been favorable not only for China, but for most of the important crop production regions on Earth.