CropWatch Bulletin

QUARTERLY REPORT ON GLOBAL CROP PRODUCTION

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Institute of Remote Sensing and Digital Earth (RADI), 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 at the Digital Agriculture Division, Institute of Remote Sensing and Digital Earth (RADI), Chinese Academy of Sciences, under the overall guidance of Professor Bingfang Wu.

Contributors are Jose Bofana, Sheng Chang, Bulgan Davdai, Mohammed Ahmed El-Shirbeny, René Gommes, Wenwen Gao, Zhaoxin He, Mingyong Li, Wenjun Liu, Olipa N. Lungu, Zonghan Ma, Jai Singh Parihar, Elijah Phiri, Shen Tan, Fuyou Tian, Battestseg Tuvdendorj, Linjiang Wang, Meiling Wang, Bingfang Wu, Qiang Xing, Jie Xiong, Jiaming Xu, Nana Yan, Mingzhao Yu, Hongwei Zeng, Miao Zhang, Xin Zhang, Dan Zhao, Xinfeng Zhao, Liang Zhu and Weiwei Zhu.

Thematic contributors for this bulletin include: Wenjiang Huang (huangwj@radi.ac.cn) and Yingying Dong (dongyy@radi.ac.cn) for the section on pest and diseases monitoring; Fengying Nie (niefengying@sohu.com) and Xuebiao Zhang (zhangxuebiao@caas.cn) for the section on food import and export outlook for 2017; English version editing was provided by Anna van der Heijden.

Corresponding author: Professor Bingfang Wu
Institute of Remote Sensing and Digital Earth, 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.

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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-October from 2012 to 2016; one of the standard reference periods.
15YA	Fifteen-year average, the average for the four-month period from July-October from 2002 to 2016; one of the standard reference periods and typically referred to as “average.”
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 2017, 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 107th 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 30 major agricultural countries and Chinese regions. 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	30 key countries (main producers and exporters) and sub-national regions	As above plus NDVI and GVG survey
Chapter 4	China	As above plus high resolution images; information on pests and diseases; and food import/export outlook
Chapter 5	Production outlook, Rangeland management and issues in Africa, 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

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).

Crop condition and production assessments are based mainly on actual and reference data on weather and crops from ground and satellite observations. Reference data include recent historical information and agricultural statistics. Data were turned into agronomically meaningful indicators, such as sunshine, cultivated areas, and crop yields, using biophysical and crop models. The scope of the analyses is global, but CropWatch pays special attention to thirty major agricultural countries and China (the "30+1" countries). Together, they make up at least 80% of the global production and exports of maize, rice, wheat, and soybean. The bulletin also includes specific sections on global production, as well as pests and diseases, trade, and prices in China.

The bulletin is issued at a time when virtually all 2017 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 2018) or are close to harvest. In the southern hemisphere the summer season/monsoon season is ongoing.

Global agroclimatic patterns

Disasters took a heavy toll on all continents during the period from July to October 2017. The period was characterized by several key events, including (1) the continuation of the complex emergency situation with a drought component in the Horn of Africa, (2) heat waves around the Mediterranean and in north America, (3) more than ten tropical storms and cyclones, essentially in Asia and the Caribbean, and (4) exceptional floods in southern Asia. Weather conditions were also abnormal in a less spectacular way: below average sunshine has affected close to 70% of the CropWatch monitoring units. The departure is sometimes in excess of -15%, which is considerable for a variable that normally undergoes little spatial variability. Especially in rice growing areas, sunshine – rather than rainfall – is often the factor that limits plant growth.

Above-average rainfall

Although "above-average" rainfall over the reporting period has damaged crops, it was often beneficial for grazing lands in semi-arid areas such as in much of the West African Sahel (Mauritania, with a CropWatch RAIN indicator measurement 33% above average) and Central Asia, where the highest departures were recorded in Southern Mongolia (RAIN +144%) and Gansu-Xinjiang (+97%). Excesses close to 30% occurred in China (Loess Region, Qinghai-Tibet, and Huanghuaihai). Large areas in Southern Asia suffered from flooding: up to one third of Bangladesh has been under water. Other areas to be mentioned include parts of southern Africa, central North America (Corn Belt and Northern Plains), and northern-central Europe (+55% in Poland), an area that also recorded abnormally cool weather and a drop in sunshine.

Rainfall deficits

The largest spatially continuous precipitation deficit area covers the whole Mediterranean basin as well the adjacent areas in the east, from the Caucasus and beyond. It includes twenty-five countries as far as

northern India. The timing corresponds to the last stages of winter crops as well as the biomass peak for summer crops, which have suffered in non-irrigated areas. Drought at the end of the period is likely to have delayed planting and germination of winter crops. Iran is one of the countries where the agricultural impact was most severe.

Other precipitation deficit areas to be mentioned include the eastern Africa region, where drought has been lasting for two years now; equatorial eastern Brazil and the west and south of the South American continent; parts of Oceania (New Zealand, -46%); and East Asia, especially the Korean peninsula because of the length of the ongoing drought. Several large areas in East Asia suffered from poor sunshine, including important production areas in China (Huanghuaihai, the Loess region, and Southwest China) as well as maritime Southeast Asia.

Production

Global

CropWatch puts the total output of the crops produced during 2017 at 2,509 million tons of major grains and 326 million tons of soybeans. The major grains are made up almost exactly by 41% maize (1,027,897 thousand tons, 2.5% over last year's output), 30% rice (as paddy, 745,448 thousand tons, up 1.0%), and 29% wheat (735,587 thousand tons, down 0.5%). The 2016 shares were 40% for maize and 30% for wheat; the differences are small but show the continuing global trend of maize expanding at the expense of rice and wheat.

Among the three major cereal producers, the output of China reached 519,584 thousand tons (down -1.9% compared with 2016); 435,918 thousand tons in the United States (+0.1%); and a significantly lower amount of 275,676 thousand tons for India (+5.4%). Although India remains a relatively minor producer of maize (19,034 thousand tons) it still out-produces the 4th and 5th cereal producers in terms of total cereal output (Brazil, 103,483 thousand tons, +16.2%; Indonesia, 86,202 thousand tons, -1.6%).

The two South American “giants” (Argentina and Brazil) significantly increased their maize output compared with the previous season (+16.5% and +19.3%, respectively). Rice producers did well in southern Asia (Pakistan +8.3%, recovering from last year’s dip; India +4.1%, in spite of widespread floods) and Vietnam (+6.7%). In general, East and Southeast Asia under-performed due to adverse weather conditions, especially the major producer China (no change in production) and Bangladesh, Thailand, Indonesia, and Myanmar where production fell 5.1%, 2.9%, 1.3%, and 0.5%, respectively.

Regarding wheat, Australia suffered a major drop (-22.1%), while the largest wheat production increases occurred in Brazil (+5.4%) and India (+8.6%).

The major producer of soybean, the United States, suffered a slight decrease in the crop's production (-0.3%), equivalent to 375 thousand tons, which is more than compensated by the production increase in Brazil (+5.4%) equivalent to 4.9 million tons. For the third year in a row, China has increased its soybean production as a result of the new agricultural policy; production numbers are reported below.

China

The current bulletin includes the latest and final revision of the CropWatch 2017 production estimates for maize, single rice, late rice, and soybean.

Overall, CropWatch puts the total 2017 output of summer crops (including maize, single rice, late rice, spring wheat, soybean, minor cereals, and tubers) at 403.0 million tons, a significant decrease (-3%) from 2016. The total annual crop production (including cereals, tubers, and legumes) is 562.3 million tons, a 1.0%

drop or 8.0 million tons less compared with 2016. Increases in total annual crop production in excess of 4% nevertheless occurred in Jiangxi, Shandong and Zhejiang provinces.

The combined production of winter and spring wheat in China increased 0.3%, while the production of maize is down to 1,889 million tons, representing a 5.2% drop compared to last year. This drop results mainly from a 3.7% decrease in planted area for maize in response to the low producer prices that have now been lasting five years. Gansu and Jiangsu are the only two provinces where maize output increased, with +4% and +1%, respectively. Responding to reduced planted areas, production drops in the range of 2% to 3% occurred in Heilongjiang, Henan, Inner Mongolia, Jilin, Liaoning, Shanxi, and Sichuan provinces. The largest drop (-5.3%) of maize area was observed in Henan province where many maize fields were converted to groundnuts.

The rice output for China did not change from 2016, although the production of late rice decreased by 1%. Production decreases linked with management and environmental conditions occurred in Fujian and Sichuan (-3% each) and Ningxia (-5%). In contrast, production increases were brought about by increased hectarage and yield in Hubei, Jiangsu, Jiangxi, and Zhejiang. Production of late rice in Hubei, Jiangxi, and Zhejiang also increased by more than 4%.

At 13,745 thousand tons, the soybean production is up 3.4% over last year. This is the second consecutive year China increases soybean production: a 1.3% yield drop was largely offset by cultivated area expansions that occurred mostly in Inner Mongolia and Heilongjiang, the country's top soybean region. Soybean production decreased in the Henan, Shanxi, Anhui, Liaoning, and Jilin resulting from unfavorable agro-climatic conditions.