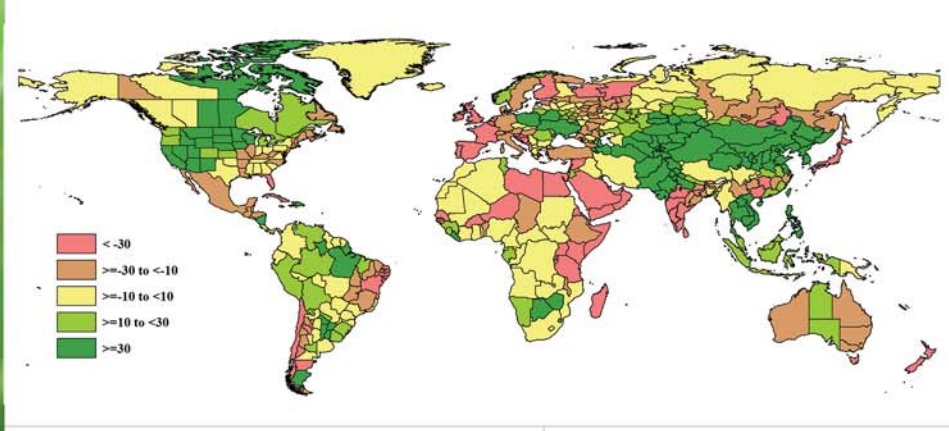

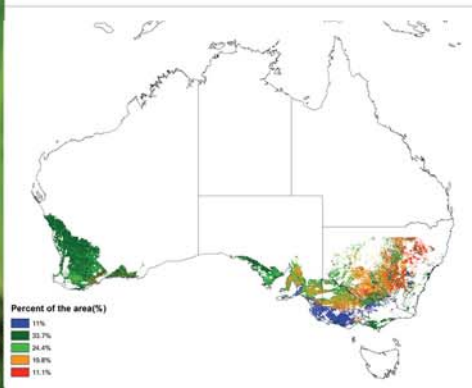

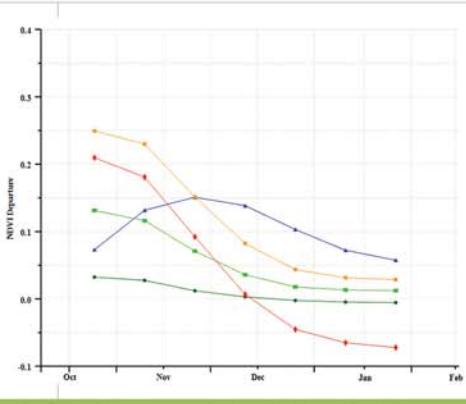

CropWatch bulletin

QUARTERLY REPORT ON GLOBAL CROP PRODUCTION

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Chinese Academy of Sciences (CAS)

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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 October-January from 2012 to 2016; one of the standard reference periods.
15YA	Fifteen-year average, the average for the four-month period from October-January 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 October 1 2016 and January 31 2017, a period referred to in this bulletin as the ONDJ (October, November, December, and January) period or just the "reporting period." The bulletin is the 104th 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 of 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, VCIx, and Cropping Intensity, 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 eight 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)	As above plus NDVI and GVG survey
Chapter 4	China	As above plus high resolution images
Chapter 5	Production outlook, disaster events, agriculture in South and Southeast Asia, and an update on El Niño.	
Online Resources	www.cropwatch.com.cn	

Regular updates and online resources

The bulletin is released quarterly in both English and Chinese. To sign up for the mailing list, please e-mail cropwatch@radi.ac.cn or visit CropWatch online at www.cropwatch.com.cn. Visit the CropWatch Website for additional resources and background materials about methodology, country agricultural profiles, and country long-term trends.

Executive summary

Introduction

The period from October 2016 to January 2017 is a relatively quiet period from an agricultural point of view. In the temperate northern hemisphere summer crops have been harvested, while winter crops have been planted and are now mostly dormant. In some tropical and equatorial countries, including the Philippines, Thailand, Vietnam and Brazil, planting of the second maize and rice generally starts around January, while in the southern hemisphere summer crops are at advanced development stages and nearing flowering, for example maize and soybean in Argentina, Brazil and South Africa.

Southern hemisphere production

Winter wheat harvesting was completed in the southern hemisphere, and the current CropWatch Bulletin provides a production estimate for the main producers: 11.245 million tons in Argentina, an increase of 5.0% over last year; 32.066 million tons in Australia (up by a spectacular 24.3%); and 7.747 million tons of winter wheat in Brazil (+10.0%). In Australia and Argentina, the output of the major production areas grew less than the areas that normally contribute little to exportable surpluses. For maize, the traditional producers and exporters in the southern hemisphere will be covered in detail in the May bulletin. The current situation for the crop, however, is promising in Brazil, the main producer in the south, but less favorable in Argentina where excess water has affected summer crops. South Africa, the third largest maize producer in the hemisphere with about 15 million tons in 2014 is currently doing well, after a rather poor performance in 2015 due to drought; CALF, the CropWatch cropped arable land fraction indicator, which assesses to what extent cropland is actually cultivated, increased by 7 percentage points. Although Australia is a minor producer of maize, CALF rose 40 percentage points over the average of the previous five years, the highest variation among all countries monitored by CropWatch. The maximum Vegetation Condition Index (VCIx), however, one of the crop performance indicators, is low for the country due to drought, which is likely to results in an altogether average output.

Global environmental conditions

Globally, CropWatch analyses identify several large areas of continental scale where conditions varied in a coherent fashion since last October. They are numbered from W01 to W05 (wet) and D01 to D10 (dry), to which the already mentioned Australia belongs. Their location is illustrated in figure 3.1.

Wet areas

The first area, W01 or northwestern America, includes major production zones of Canada and the United States (CALF, +10 percentage points) where temperature exceeded seasonal values and where prospects of winter crops are favorable. Next, in northern and central-south America (W02), some areas recorded excess rainfall, as was already mentioned for parts of Argentina. Contrary to W01, W03 (northern-central Europe) was not only wet but also cold, and crop prospects are about average. The area includes Poland (VCIx=0.88) and Ukraine, two countries where snow was unusually abundant in January. In Ukraine, VCIx was just fair (0.67) and CALF dropped by 12 percentage points compared with the recent seasons. The next area, W04, is very large and extends from the western Caspian and northwest India to eastern Asia (Qinghai province of China). It recorded about double of average precipitation, and the CropWatch biomass production potential (BIOMSS) increased accordingly. The last wet area, W05, encompasses

most of continental and maritime Southeast Asia; it had some very large rainfall increases (Cambodia, RAIN, +120%), some of which were brought about by cyclones (see also section 5.2 on disasters for details). Altogether, CALF in this area was relatively stable (extremes are -4% in Cambodia and 0% in Thailand), but VCIx was high, at least 0.87 (Cambodia, Indonesia), reaching 0.94 in Thailand. Production prospects are generally above average.

Dry areas

In America, the first identified dry area (D01) extends from the northeastern United States to the Caribbean and Honduras. The average rainfall deficit here reached 21%, with temperature (TEMP) above average by 1°C. In Mexico, which is part of the area, CALF is up 8% with VCIx=0.88, and crop prospects are favorable. In the second dry area, D02 or the western Cono Sul, an area that includes some important pastoral areas, the drop in the biomass production potential indicator (BIOMSS) reached 28% due to drought and low temperature.

The next area, D03, coincides approximately with the Western European Major Production Zone (MPZ) for which chapter 2 provides a detailed analysis. Low rainfall (-30% on average) combined with below average temperature (-1.8°C) affected mostly France where VCIx is 0.73. In other areas, considering the still early stage of the season, prospects remain average or just below.

In D04, the Eastern Mediterranean, the average rainfall deficit was 39%. Turkey, the major agricultural country in the area experienced a marked drop in CALF (-20 percentage points) with one of the lowest VCIx values (0.55). In Egypt, the most populated country in the area and a major global food importer, prospects of winter crops are below average.

Next, in Eastern Africa (D05), BIOMSS dropped 39% due to drought; in several countries 2016 was the second consecutive drought year. In Ethiopia, however, in spite of RAIN being down 26%, CALF is up 6 percentage points with a VCIx of 0.90.

D06 to D09 occur in the eastern European continent and Asia. The first covers western Russia, where RAIN was down by 21% and TEMP by -2.0°C. Considering that CALF in this area is up 16 percentage points, crop prospects remain favorable. D07, southern Siberia to Japan, is of minor global wheat production areas, where rainfall deficit in the region average is -28%, with a temperature anomaly of -1.2°C. The D08 area, which includes several Chinese provinces (Yunnan to Jiangxi) and where rainfall was 28% below average, will be mentioned again below. D09 (most of southern and eastern India) is one of the most problematic areas of the current reporting period. The deficit of rainfall reaches 46%, and this occurs after the damage caused by floods in previous months (and reported in previous CropWatch bulletins). At the same time, however, the northwestern and northern-central areas, which are mostly irrigated, benefited from above average rainfall. Altogether, considering that CALF did not change significantly, crop prospects remain fair.

Finally, D10 includes Australia, which was mentioned above, and New Zealand, where rainfall fell 52% nationwide during the reporting period.

China

China enjoyed crop conditions not unlike those of the previous season: TEMP was 0.7°C above average and RAIN was up 12%, combined with a drop in solar radiation (RADPAR, -12%).

Generally, the Northeast and Inner Mongolia regions do not have any crops in the field at this time of reporting because temperature is climatically too low for winter crops. Hibernating winter wheat occurs in all other regions, so that current water supply (as rain or snow) will eventually benefit crops after the winter dormancy phase, especially in the Loess region and Southwest China, two regions where

production prospects are favorable. The regions that will need close monitoring include Huanghuaihai (CALF, down 6 percentage points), Lower Yangtze (CALF dropped 8 percentage points, and indicators undergo a lot of spatial variability), as well as Southwest China where adverse conditions could develop in Chongqing, Guizhou, Hubei, Hunan, and especially Sichuan. In Southern China, crop condition in central Guangdong deserves close monitoring as well, due to its below average condition during the whole period, with VCIx below 0.5.

At the national level, CALF was generally stable with a bit of decreasing in comparison with the previous five years' average, and the overall expectations for the forthcoming winter wheat remain fair.

The bulletin also includes a section on domestic prices; they include a likely increase for rice and a projected decrease for maize and wheat. For soybeans, wide fluctuations are conjectured.