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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 from October-January, from 2010-2011 to 2014-2015; one of the standard reference periods.
14YA	Fourteen-year average, the average for the four month period from October-January, from 2001-2002 to 2014-2015; one of the standard reference periods and typically referred to as “average.”
BIOMSS	Agroclimatic indicator for biomass production potential
BOM	Australian Bureau of Meteorology
CALF	Cropped Arable Land Fraction
CAS	Chinese Academy of Sciences
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
GMO	Genetically Modified Organism
GVG	GPS, Video, and GIS data
ha	hectare
kcal	kilocalorie
MPZ	Major Production Zone
MRU	Monitoring and Reporting Unit
NDVI	Normalized Difference Vegetation Index
OCHA	UN Office for the Coordination of Humanitarian Affairs
PAR	Photosynthetically active radiation
RADI	CAS Institute of Remote Sensing and Digital Earth
RADPAR	PAR agroclimatic indicator
RAIN	Rainfall agroclimatic indicator
SOI	Southern Oscillation Index
TEMP	Air temperature agroclimatic indicator
Ton	Thousand kilograms
VCIx	Maximum Vegetation Condition Index
VHI	Vegetation Health Index
VHIn	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 1 October 2015 and 10 January 2016 (from hereon referred to as October-January). It is the 100th bulletin produced by the CropWatch group at the Institute of Remote Sensing and Digital Earth (RADI) at the Chinese Academy of Sciences, Beijing. CropWatch analyses are based mostly on several standard and 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 the increasing spatial precision of the analyses, indicators become more focused on agriculture as the analyses zoom into 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, CI, and VCIx, describing crop condition and development. 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 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.

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, CI
Chapter 3	30 key countries (main producers and exporters)	As above plus NDVI
Chapter 4	China	As above
Chapter 5	Special topics: Southern hemisphere production update, disaster events, an overview of agricultural and environmental issues in the Zambezi basin, and El Niño.	
Online Resources	www.cropwatch.com.cn	

Newsletter 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

The period from October 2015 to mid-January 2016 is a relatively quiet period from an agricultural point of view. In the temperate northern hemisphere summer crops have been harvested, while winter crops were planted and are 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.

In the same countries, wheat harvesting was mostly completed or is about to be completed and the current CropWatch Bulletin provides a production update as well a first quantitative assessment of maize in South Africa, a region badly hit by El Niño-related drought, the most noteworthy feature of the current reporting period (sections 5.1, 5.2 on disasters and the South Africa page in section 3.2).

In Argentina, the updated CropWatch wheat output estimate stands at 10.7 million tons, 11% below the 2014-2015 production; both harvested area and yield decreased when compared to last year due to complex agroclimatic patterns. In neighboring Brazil, wheat production is up 4.5% over last year, to reach a total of 7 million tons.

For Australia, CropWatch puts the overall output at 25 million tons, 1% below last year, due to prevailing drought conditions (maximum vegetation condition index VCIx at 0.68, one of the lowest national values recorded) in spite of a CALF increase of 4%. Other countries with low VCIx values include Russia, Ukraine, Kazakhstan and India.

According to the CropWatch cropped arable land fraction indicator (CALF; see tables 2.2 and 3.1) the major food producing areas in South America, which are located in Argentina and Brazil, cultivated almost all available arable land (98%), an increase of 9% over the average of the recent five years (8% in Argentina and 14% in Brazil). In contrast, all other main producers in Asia, Europe and North America cultivated about 85% of arable land, which is about the same area (referring to the October 2015-January 2016 period) as during the previous season. In none of them does the change come close to the South American values: Russia, +4%; USA +2%; France, Germany, United Kingdom, Thailand, Vietnam, Philippines: all 0%. There are also negative values which can mostly be linked with agroclimatic conditions, including Canada, -2%; Poland, -3%; Romania -5%; Ukraine, -3%; Turkey, -3% and Pakistan, -2%.

South Africa is one of the countries most seriously hit by adverse weather conditions during the current reporting period. Due to drought, CALF of South Africa dropped 12% and VCIx reached just 0.48, the absolute record low for any country. CropWatch analyses show a considerable reduction of area cultivated under maize (-34%) in otherwise significant producer provinces (Free State, North West and Limpopo). Combined with low yields (down 16% from last year) the estimated total maize output of South Africa will be down to 7.3 million tons, a 45% reduction from last year's 13.2 million tons output. The precipitation deficit reached 44% in Lesotho, 42% in Zimbabwe and 36% in Malawi.

Abnormal weather conditions are also reported from several other, spatially coherent areas (Chapter 1 and section 3.1, Figures 1.1. to 1.4 and 3.1 to 3.4). Even if, for some of them, it is still early to evaluate impacts in terms of production, they include (1) the Horn of Africa, especially Ethiopia (See sections 3.2 and 5.2) where more than ten million people are severely food insecure due to drought; (2) many southern European and Mediterranean countries, which all grow winter crops planted at the end of the year and which recorded a drop in precipitation close to or exceeding 50% (Morocco, -74%; Portugal, -55%

and Lebanon, -54%); (3) northern South America (-56% of rainfall on average, e.g. -70% in Suriname and -62% in Guyana and several states in Brazil, such as Roraima (-78%) and Amapa (-71%); (4) south-east Asia to New-Zealand (New Zealand, -66%; Timor Leste, -57%; Tasmania, -75%); (5) the northern part of the Indian subcontinent, with an average precipitation departure of -52% affecting Bangladesh and Bhutan (-38% and -37%, respectively) as well as several Indian states (Meghalaya, -81%; Jharkhand, -80%; West Bengal, -73%).

Several of the same areas have also suffered from floods; (6) California (-37% precipitation over the reporting period), north-eastern USA and Canada with deficits ranging from -52% (Maine) to -39% (Massachusetts) and (7) Baltic states (Estonia, -41%; Latvia, -37%) as well as the adjacent Russian areas to the east: S. Petersburg (-48%), Adygeya Republic, Tverskaya and Pskovskaya Oblasts.

In China, the reporting period is the major planting time of winter crops including winter wheat and rapeseed, right after the harvest of autumn crops. Agroclimatic conditions were generally warm and wet (Figures 4.1 and 4.2) in all seven agricultural regions recorded above average rainfall, especially in the areas south of Yangtze River. VCIx (Figure 4.4) was distributed unevenly, with high values mostly in Sichuan and Central Hebei Province and low values in the North China Plain and north-west region. CALF was close to average. Assuming average agro-climatic conditions to the time of harvest, CropWatch estimates that 2015-16 winter crop output will be slightly above 2014-2015.

Based on the combination of agroclimatic and agronomic indicators, CropWatch lists the following countries as likely to under-perform in terms or production: South Africa and some neighboring countries, Ethiopia, Indonesia, Turkey and other Mediterranean countries. Output is expected to only be fair in India (due to widespread and repeated environmental shocks) and Bangladesh, Ukraine and possibly Poland and Romania, where cropped arable land decreased under water stress conditions. Both Russia and Kazakhstan recorded satisfactory precipitation but poor vegetation condition is widespread. In Brazil, the overall situation is unclear due to low rainfall in the major soybean producing state of Mato Grosso.