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Contents

NOTE: CROPWATCH RESOURCES, BACKGROUND MATERIALS AND ADDITIONAL DATA ARE AVAILABLE ONLINE AT WWW.CROPWATCH.COM.CN.

CONTENTS	III
ABBREVIATIONS	VI
BULLETIN OVERVIEW AND REPORTING PERIOD	VII
EXECUTIVE SUMMARY	9
CHAPTER 1. GLOBAL AGROCLIMATIC PATTERNS	11
1.1 INTRODUCTION TO CROPWATCH AGROCLIMATIC INDICATORS (CWAIs)	11
1.2 GLOBAL OVERVIEW	11
1.3 RAINFALL	14
1.4 TEMPERATURES	15
1.5 RADPAR	15
1.6 BIOMSS	16
CHAPTER 2. CROP AND ENVIRONMENTAL CONDITIONS IN MAJOR PRODUCTION ZONES	17
2.1 OVERVIEW	17
2.2 WEST AFRICA	18
2.3 NORTH AMERICA	19
2.4 SOUTH AMERICA	21
2.5 SOUTH AND SOUTHEAST ASIA	23
2.6 WESTERN EUROPE	25
2.7 CENTRAL EUROPE TO WESTERN RUSSIA	27
CHAPTER 3. CORE COUNTRIES	30
3.1 OVERVIEW	30
3.2 COUNTRY ANALYSIS	35
CHAPTER 4. CHINA	174
4.1 OVERVIEW	174
4.2 CHINA'S WINTER CROPS PRODUCTION	176
4.3 REGIONAL ANALYSIS	179
CHAPTER 5. FOCUS AND PERSPECTIVES	193
5.1 CROPWATCH FOOD PRODUCTION ESTIMATES	193
5.2 DISASTER EVENTS	196
5.3 UPDATE ON EL NIÑO	201
ANNEX A. AGROCLIMATIC INDICATORS	204
ANNEX B. QUICK REFERENCE TO CROPWATCH INDICATORS, SPATIAL UNITS AND METHODOLOGIES	211
DATA NOTES AND BIBLIOGRAPHY	219
ACKNOWLEDGMENTS	223
ONLINE RESOURCES	224

LIST OF TABLES

TABLE 1.1 DEPARTURES FROM THE RECENT 15-YEAR AVERAGE OF CROPWATCH AGRO-CLIMATIC INDICATORS OVER REGIONAL MRU GROUPS	14
TABLE 2.1 AGROCLIMATIC INDICATORS BY MAJOR PRODUCTION ZONE, CURRENT VALUE AND DEPARTURE FROM 15YA (JULY-OCTOBER 2020)	17
TABLE 2.2 AGRONOMIC INDICATORS BY MAJOR PRODUCTION ZONE, CURRENT SEASON VALUES AND DEPARTURE FROM 5YA (JULY-OCTOBER 2020).....	17
TABLE 3.1 JULY- OCTOBER 2020 AGRO-CLIMATIC AND AGRONOMIC INDICATORS BY COUNTRY, CURRENT VALUE AND DEPARTURE FROM AVERAGE.....	34
TABLE 3.2 AFGHANISTAN'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY - OCTOBER 2020	38
TABLE 3.3 AFGHANISTAN'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY - OCTOBER 2020..	38
TABLE 3.4 ANGOLA'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY - OCTOBER 2020	41
TABLE 3.5 ANGOLA'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY - OCTOBER 2020	41
TABLE 3.6 ARGENTINA'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY - OCTOBER 2020	44
TABLE 3.7 ARGENTINA'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY - OCTOBER 2020..	44
TABLE 3.8 AUSTRALIA'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY - OCTOBER 2020	47
TABLE 3.9 AUSTRALIA'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY-OCTOBER 2020....	47
TABLE 3.10 BANGLADESH'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY-OCTOBER 2020 ..	50
TABLE 3.11 BANGLADESH'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY-OCTOBER 2020....	50
TABLE 3.12 BELARUS'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY - OCTOBER 2020.	53
TABLE 3.13 BELARUS'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY - OCTOBER 2020.	53
TABLE 3.14 BRAZIL'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY - OCTOBER 2020	58
TABLE 3.15 BRAZIL'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY - OCTOBER 2020	58
TABLE 3.16 CANADA'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY - OCTOBER 2020	60
TABLE 3.17 CANADA'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY - OCTOBER 2020..	61
TABLE 3.18 GERMANY AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY-OCTOBER 2020..	65
TABLE 3.19 GERMANY'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUE AND DEPARTURE FROM 5YA, JULY-OCTOBER 2020	65
TABLE 3.20 EGYPT'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY- OCTOBER 2020	68
TABLE 3.21 EGYPT'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY- OCTOBER 2020.....	68

TABLE 3.22 ETHIOPIA'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY- OCTOBER 2020 . 71	71
TABLE 3.23 ETHIOPIA'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY- OCTOBER 2020... 72	72
TABLE 3.24 FRANCE'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY- OCTOBER 2020 . 75	75
TABLE 3.25 FRANCE'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY- OCTOBER 2020..... 76	76
TABLE 3.26 UNITED KINGDOM'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY- OCTOBER 2020 79	79
TABLE 3.27 UNITED KINGDOM'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY- OCTOBER 2020... 79	79
TABLE 3.28 HUNGARY'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY- OCTOBER 2020 . 82	82
TABLE 3.29 HUNGARY'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY- OCTOBER 2020... 82	82
TABLE 3.30 INDONESIA'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY – OCTOBER 2020 84	84
TABLE 3.31 INDONESIA'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY - OCTOBER 2020.. 85	85
TABLE 3.32 INDIA'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY-OCTOBER 2020 88	88
TABLE 3.33 INDIA'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY-OCTOBER 2020 89	89
TABLE 3.34 IRAN'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY - OCTOBER 2020 92	92
TABLE 3.35 IRAN'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUE AND DEPARTURE FROM 5YA, JULY - OCTOBER 2020..... 92	92
TABLE 3.36 ITALY'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY-OCTOBER 2020 95	95
TABLE 3.37 ITALY'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY-OCTOBER 2020..... 95	95
TABLE 3.38 KAZAKHSTAN AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY-OCTOBER2020... 98	98
TABLE 3.39 KAZAKHSTAN, AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY-OCTOBER 2020 98	98
TABLE 3.40 KENYA'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY -OCTOBER 2020 101	101
TABLE 3.41 KENYA'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE, JULY - OCTOBER 2020 101	101
TABLE 3.42 KYRGYZSTAN'S AGROCLIMATIC INDICATORS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY - OCTOBER 2020 103	103
TABLE 3.43 KYRGYZSTAN'S AGRONOMIC INDICATORS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY - OCTOBER 2020..... 103	103
TABLE 3.44 CAMBODIA'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY - OCTOBER 2020 106	106

TABLE 3.45 CAMBODIA'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY - OCTOBER 2020	106
TABLE 3.46 SRI LANK'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY - OCTOBER 2020	109
TABLE 3.47 SRI LANK'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY - OCTOBER 2020	109
TABLE 3.48 MOROCCO'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY - OCTOBER 2020	111
TABLE 3.49 MOROCCO'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY - OCTOBER 2020	112
TABLE 3.50 MEXICO'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY - OCTOBER 2020	115
TABLE 3.51 MEXICO'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY - OCTOBER 2020	115
TABLE 3.52 MYANMAR'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY - OCTOBER 2020	118
TABLE 3.53 MYANMAR'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY - OCTOBER 2020	118
TABLE 3.54 MONGOLIA'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY - OCTOBER 2020	121
TABLE 3.55 MONGOLIA'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY - OCTOBER 2020	121
TABLE 3.56 MOZAMBIQUE AGRO-CLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY-OCTOBER 2020.	125
TABLE 3.57 MOZAMBIQUE AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY-OCTOBER 2020. .	125
TABLE 3.58 NIGERIA'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY - OCTOBER 2020	128
TABLE 3.59 NIGERIA'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY - OCTOBER 2020	128
TABLE 3.60 PAKISTAN'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY-OCTOBER 2020	131
TABLE 3.61 PAKISTAN'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY-OCTOBER 2020..	131
TABLE 3.62 PHILIPPINES' AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY - OCTOBER 2020	134
TABLE 3.63 PHILIPPINES' AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY - OCTOBER 2020	134
TABLE 3.64 POLAND'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY-OCTOBER 2020	137
TABLE 3.65 POLAND'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY-OCTOBER 2020.....	137

TABLE 3.66 ROMANIA'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY - OCTOBER 2020	140
TABLE 3.67 ROMANIA'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY - OCTOBER 2020	140
TABLE 3.68 RUSSIA'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY - OCTOBER 2020	144
TABLE 3.69 RUSSIA'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY - OCTOBER 2020	144
TABLE 3.70 THAILAND'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY - OCTOBER 2020	148
TABLE 3.71 THAILAND'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY - OCTOBER 2020	148
TABLE 3.72 TURKEY'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY - OCTOBER 2020	151
TABLE 3.73 TURKEY'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY - OCTOBER 2020	151
TABLE 3.74 UKRAINE'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, - JULY- OCTOBER 2020	153
TABLE 3.75 UKRAINE'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY- OCTOBER 2020.....	154
TABLE 3.76 UNITED STATES' AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY2020 TO OCTOBER 2020	159
TABLE 3.77 UNITED STATES' AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE, JULY2020 TO OCTOBER 2020	159
TABLE 3.78 UZBEKISTAN'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY - OCTOBER 2020	161
TABLE 3.79 UZBEKISTAN'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY - OCTOBER 2020	162
TABLE 3.80 VIETNAM'S AGRO-CLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY-OCTOBER 2020	166
TABLE 3.81 VIETNAM'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY-OCTOBER 2020..	166
TABLE 3.82 SOUTH AFRICA'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY - OCTOBER 2020	170
TABLE 3.83 SOUTH AFRICA'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY - OCTOBER 2020	170
TABLE 3.84 ZAMBIA'S AGROCLIMATIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 15YA, JULY - OCTOBER 2020	172
TABLE 3.85 ZAMBIA'S AGRONOMIC INDICATORS BY SUB-NATIONAL REGIONS, CURRENT SEASON'S VALUES AND DEPARTURE FROM 5YA, JULY - OCTOBER 2020	172

TABLE 4.1 CROPWATCH AGROCLIMATIC AND AGRONOMIC INDICATORS FOR CHINA, JULY - OCTOBER 2020, DEPARTURE FROM 5YA AND 15YA.....	175
TABLE 4.2 CHINA 2020 WINTER CROPS, SUMMER CROPS AND TOTAL ANNUAL CROP PRODUCTION AND PERCENTAGE DIFFERENCE FROM 2019, BY PROVINCE.....	177
TABLE 4.3 CHINA 2020 PRODUCTION (THOUSAND TONS) OF MAIZE, RICE, WHEAT, AND SOYBEAN, AND PERCENTAGE CHANGE FROM 2019, BY PROVINCE	178
TABLE 4.4 CHINA 2020 EARLY RICE, SINGLE RICE/SEMI-LATE RICE, AND LATE RICE PRODUCTION AND PERCENTAGE DIFFERENCE FROM 2019, BY PROVINCE.....	179
TABLE 5.1 2020 CEREAL AND SOYBEAN PRODUCTION ESTIMATES IN THOUSAND TONNES. Δ IS THE PERCENTAGE OF CHANGE OF 2020 PRODUCTION WHEN COMPARED WITH CORRESPONDING 2019 VALUES.	193
TABLE A.1 JUL 2020 - OCT 2020 AGROCLIMATIC INDICATORS AND BIOMASS BY GLOBAL MONITORING AND REPORTING UNIT (MRU).....	204
TABLE A.2 JUL 2020 - OCT 2020 AGROCLIMATIC INDICATORS AND BIOMASS BY COUNTRY	206
TABLE A.3 ARGENTINA, JUL 2020 - OCT 2020 AGROCLIMATIC INDICATORS AND BIOMASS (BY PROVINCE)	207
TABLE A.4 AUSTRALIA, JUL 2020 - OCT 2020 AGROCLIMATIC INDICATORS AND BIOMASS (BY STATE)	207
TABLE A.5 BRAZIL, JUL 2020 - OCT 2020 AGROCLIMATIC INDICATORS AND BIOMASS (BY STATE)	207
TABLE A.6 CANADA, JUL 2020 - OCT 2020 AGROCLIMATIC INDICATORS AND BIOMASS (BY PROVINCE).....	207
TABLE A.7 INDIA, JUL 2020 - OCT 2020 AGROCLIMATIC INDICATORS AND BIOMASS (BY STATE)	208
TABLE A.8 KAZAKHSTAN, JUL 2020 - OCT 2020 AGROCLIMATIC INDICATORS AND BIOMASS (BY OBLAST)	208
TABLE A.9 RUSSIA, JUL 2020 - OCT 2020 AGROCLIMATIC INDICATORS AND BIOMASS (BY OBLAST, KRAY AND REPUBLIC)	209
TABLE A.10 UNITED STATES, JUL 2020 - OCT 2020 AGROCLIMATIC INDICATORS AND BIOMASS (BY STATE).....	210
TABLE A.11 CHINA, JUL 2020 - OCT 2020 AGROCLIMATIC INDICATORS AND BIOMASS (BY PROVINCE).....	210

LIST OF FIGURES

FIGURE 1.1 GLOBAL DEPARTURE FROM RECENT 15 YEAR AVERAGE OF THE RAIN, TEMP AND RADPAR INDICATORS SINCE 2017 ONDJ PERIOD (AVERAGE OF 65 MRUS, UNWEIGHTED)	13
FIGURE 1.2 GLOBAL MAP OF RAINFALL ANOMALY (AS INDICATED BY THE RAIN INDICATOR) BY CROPWATCH MAPPING AND REPORTING UNIT: DEPARTURE OF JULY TO OCTOBER 2020 TOTAL FROM 2005-2019 AVERAGE (15YA), IN PERCENT....	14
FIGURE 1.3 GLOBAL MAP OF TEMPERATURE ANOMALY (AS INDICATED BY THE TEMP INDICATOR) BY CROPWATCH MAPPING AND REPORTING UNIT: DEPARTURE OF JULY TO OCTOBER 2020 AVERAGE FROM 2005-2019 AVERAGE (15YA), IN °C	15
FIGURE 1.4 GLOBAL MAP OF PHOTOSYNTHETICALLY ACTIVE RADIATION ANOMALY (AS INDICATED BY THE RADPAR INDICATOR) BY CROPWATCH MAPPING AND REPORTING UNIT: DEPARTURE OF JULY TO OCTOBER 2020 TOTAL FROM 2005-2019 AVERAGE (15YA), IN PERCENT.	15
FIGURE 1.5 GLOBAL MAP OF BIOMASS ACCUMULATION (AS INDICATED BY THE BIOMSS INDICATOR) BY CROPWATCH MAPPING AND REPORTING UNIT (MRU), DEPARTURE FROM 15YA BETWEEN BETWEEN JULY TO OCTOBER 2020.....	16
FIGURE 3.1 NATIONAL AND SUBNATIONAL RAINFALL ANOMALY (AS INDICATED BY THE RAIN INDICATOR) OF JULY TO OCTOBER 2020 TOTAL RELATIVE TO THE 2005-2019 AVERAGE (15YA), IN PERCENT	32
FIGURE 3.2 NATIONAL AND SUBNATIONAL TEMPERATURE ANOMALY (AS INDICATED BY THE TEMP INDICATOR) OF JULY TO OCTOBER 2020 AVERAGE RELATIVE TO THE 2005-2019 AVERAGE (15YA), IN °C	32
FIGURE 3.3 NATIONAL AND SUBNATIONAL SUNSHINE ANOMALY (AS INDICATED BY THE RADPAR INDICATOR) OF JULY TO OCTOBER 2020 TOTAL RELATIVE TO THE 2005-2019 AVERAGE (15YA), IN PERCENT	33
FIGURE 3.4 NATIONAL AND SUBNATIONAL BIOMASS PRODUCTION POTENTIAL ANOMALY (AS INDICATED BY THE BIOMSS INDICATOR) OF JULY TO OCTOBER 2020 TOTAL RELATIVE TO THE 2005-2019 AVERAGE (15YA), IN PERCENT.....	33
FIGURE 3.5 AFGHANISTAN'S CROP CONDITION, JULY - OCTOBER 2020	37
FIGURE 3.6 ANGOLA'S CROP CONDITION, JULY-OCTOBER 2020.....	39
FIGURE 3.7 ARGENTINA'S CROP CONDITION, JULY - OCTOBER 2020.....	43
FIGURE 3.8 AUSTRALIA'S CROP CONDITION, JULY - OCTOBER 2020	45
FIGURE 3.9 BANGLADESH'S CROP CONDITION, JULY - OCTOBER 2020.....	48
FIGURE 3.10 BELARUS'S CROP CONDITION, JULY - OCTOBER 2020.....	51
FIGURE 3.11 BRAZIL'S CROP CONDITION, JULY - OCTOBER 2020.....	55
FIGURE 3.12 CANADA'S CROP CONDITION, JULY - OCTOBER 2020	59
FIGURE 3.13 GERMANY'S CROP CONDITION, JULY-OCTOBER 2020	63
FIGURE 3.14 EGYPT'S CROP CONDITION, JULY- OCTOBER 2020	66
FIGURE 3.15 ETHIOPIA'S CROP CONDITION, JULY-OCTOBER 2020.....	70
FIGURE 3.16 FRANCE'S CROP CONDITION, JULY - OCTOBER 2020.....	74
FIGURE 3.17 UNITED KINGDOM'S CROP CONDITION, JULY - OCTOBER 2020	77
FIGURE 3.18 HUNGARY'S CROP CONDITION, JULY-OCTOBER 2020	81
FIGURE 3.19 INDONESIA'S CROP CONDITION, JULY – OCTOBER 2020.....	83
FIGURE 3.20 INDIA'S CROP CONDITION, JULY-OCTOBER 2020	87
FIGURE 3.21 IRAN'S CROP CONDITION, JULY - OCTOBER 2020.....	90
FIGURE 3.22 ITALY'S CROP CONDITION, JULY-OCTOBER 2020	93
FIGURE 3.23 KAZAKHSTAN'S CROP CONDITION, JULY-OCTOBER 2020	96
FIGURE 3.24 KENYA'S CROP CONDITION, JULY-OCTOBER 2020	99
FIGURE 3.25 KYRGYZSTAN'S CROP CONDITION, JULY - OCTOBER 2020	102

FIGURE 3.26 CAMBODIA'S CROP CONDITION, JULY - OCTOBER 2020	105
FIGURE 3.27 SRI LANKA'S CROP CONDITION, JULY - OCTOBER 2020	108
FIGURE 3.28 MOROCCO'S CROP CONDITION, JULY - OCTOBER 2020.....	110
FIGURE 3.29 MEXICO'S CROP CONDITION, JULY - OCTOBER 2020	113
FIGURE 3.30 MYANMAR'S CROP CONDITION, JULY - OCTOBER 2020	116
FIGURE 3.31 MONGOLIA'S CROP CONDITION, JULY - OCTOBER 2020.....	119
FIGURE 3.32 MOZAMBIQUE'S CROP CONDITION, JULY - OCTOBER 2020	122
FIGURE 3.33 NIGERIA'S CROP CONDITION, JULY - OCTOBER 2020	126
FIGURE 3.34 PAKISTAN'S CROP CONDITION, JULY-OCTOBER, 2020	129
FIGURE 3.35 PHILIPPINES' CROP CONDITION, JULY - OCTOBER 2020	133
FIGURE 3.36 POLAND'S CROP CONDITION, JULY - OCTOBER 2020.....	136
FIGURE 3.37 ROMANIA'S CROP CONDITION, JULY - OCTOBER 2020	139
FIGURE 3.38 RUSSIA'S CROP CONDITION, JULY - OCTOBER 2020	142
FIGURE 3.39 THAILAND'S CROP CONDITION, JULY - OCTOBER 2020	146
FIGURE 3.40 TURKEY'S CROP CONDITION, JULY - OCTOBER 2020	149
FIGURE 3.41 UKRAINE'S CROP CONDITION, JULY- OCTOBER 2020.....	152
FIGURE 3.42 UNITED STATES' CROP CONDITION, JULY - OCTOBER 2020.....	157
FIGURE 3.43 UZBEKISTAN'S CROP CONDITION, JULY - OCTOBER 2020.....	160
FIGURE 3.44 VIETNAM'S CROP CONDITION, JULY-OCTOBER 2020.....	164
FIGURE 3.45 SOUTH AFRICA'S CROP CONDITION, JULY - OCTOBER 2020.....	168
FIGURE 3.46 ZAMBIA'S CROP CONDITION, JULY - OCTOBER 2020	171
FIGURE 4.1 CHINA CROP CALENDAR.....	175
FIGURE 4.2 CHINA SPATIAL DISTRIBUTION OF RAINFALL PROFILES, JULY TO OCT 2020 ..	175
FIGURE 4.3 CHINA SPATIAL DISTRIBUTION OF TEMPERATURE PROFILES, JULY TO OCT 2020	175
FIGURE 4.4 CHINA CROPPED AND UNCROPPED ARABLE LAND, BY PIXEL, JULY TO OCT 2020.....	176
FIGURE 4.5 CHINA MAXIMUM VEGETATION CONDITION INDEX (VCIX), BY PIXEL, JULY TO OCT 2020.....	176
FIGURE 4.6 CHINA BIOMASS DEPARTURE MAP FROM 15YA, BY PIXEL, JULY TO OCT 2020	176
F FIGURE 4.7 CHINA MINIMUM VEGETATION HEALTH INDEX (VHIM), BY PIXEL, JULY TO OCT 2020.....	176
FIGURE 4.8 CROP CONDITION CHINA NORTHEAST REGION, JULY - OCTOBER 2020.....	181
FIGURE 4.9 CROP CONDITION CHINA INNER MONGOLIA, JULY - OCTOBER 2020	182
FIGURE 4.10 CROP CONDITION CHINA HUANGHUAHAI REGION, JULY - OCTOBER 2020	184
FIGURE 4.11 CROP CONDITION CHINA LOESS REGION, JULY - OCTOBER 2020	185
FIGURE 4.12 CROP CONDITION CHINA LOWER YANGTZE REGION, JULY - OCTOBER 2020	187
FIGURE 4.13 CROP CONDITION CHINA SOUTHWEST REGION, JULY-OCTOBER 2020.....	189
FIGURE 4.14 CROP CONDITION CHINA SOUTHERN REGION, JULY - OCTOBER 2020.....	191
FIGURE 5.1 FAO DESERT LOCUST BULLETIN, THE CURRENT SITUATION DURING NOVEMEBR 2020.....	197
FIGURE 5.2 FAO DESERT LOCUST BULLETIN, FORECAST UNTIL MID-DECEMBER 2020.	198
FIGURE 5.3 THE MASSIVE DAMAGE OF THE MAIZE FIELDS IN IOWA, USA, AFTER THE DERECHO ON AUGUST 10, 2020.....	198

FIGURE 5.4 REMOTE SENSING MONITORING RESULTS OF MAIZE LODGING IN HEILONGJIANG AND JILIN PROVINCES OF CHINA IN 2020	199
FIGURE 5.5 COMPARISON BETWEEN UAV AERIAL IMAGERY AND REMOTE SENSING MONITORING OF MAIZE LODGING AREA IN ZHAODONG, HEILONGJIANG PROVINCE	199
FIGURE 5.6 THE OVERFLOW IN SONGHUA RIVER LOCATED IN THE HEILONGJIANG PROVINCE OF NORTHEAST CHINA ON OCTOBER 25, 2020 (RIGHT) COMPARED TO NORMAL YEAR (NOVEMBER 1, 2019, ON THE LEFT). THE RIVER OVERFLOW WAS CAPTURED BY TWO MODIS TERRA SATELLITE IMAGES DISPLAYED IN FALSE-COLOR USING INFRARED AND VISIBLE LIGHT (BANDS 7-2-1) TO BETTER DISTINGUISH WATER FROM LAND. VEGETATION APPEARS GREEN, WATER APPEARS DARK BLUE, AND BARE LAND APPEARS BROWN.	200
FIGURE 5.7 THE STANDARDIZED PRECIPITATION-EVAPOTRANSPIRATION INDEX (SPEI) ESTIMATED GLOBALLY FOR THE MONTHS; JULY TO SEPTEMBER OF 2020,	201
FIGURE 5.8 MONTHLY SOI-BOM TIME SERIES FROM JULY 2019 TO JULY 2020	202
FIGURE 5.9 MAP OF NINO REGION	202
FIGURE 5.10 OCTOBER 2020 SEA SURFACE TEMPERATURE DEPARTURE FROM THE 1961-1990 AVERAGE	203

Abbreviations

5YA	Five-year average, the average for the four-month period from July to October for 2015-2019; one of the standard reference periods.
15YA	Fifteen-year average, the average for the four-month period from July to October 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	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	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 July and October 2020, 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 119th 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 217 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 210 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 October 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 third CropWatch production estimates for selected countries and reviews the first production estimation in chapter 5.

This report for the period from July to October 2020 covers wheat, maize, soybean and rice production in the Northern Hemisphere. Winter wheat reached maturity in June/July. The harvest of the summer crops (spring wheat, maize, rice and soybean) started in August and was mostly finished by the end of October. In the southern hemisphere, wheat is the only major crop that was grown during this monitoring period. It reaches maturity in October (Southern Brazil) or in November and December (Argentina, South Africa and Australia).

So far, the outbreak of COVID-19 has had limited impact on the production of the major crops. As this, and other reports, show, production levels of the major staple crops, such as maize, rice, wheat and soybean remained high and also benefitted from generally favorable weather conditions. However, disruptions in the domestic food supply chains, price hikes, loss of remittances and income have mostly hurt the people who were already poor. Before the pandemic outbreak covered the entire globe, 690 million people were already chronically and 135 million were acutely food insecure. The U.N. World Food Programme has warned that an additional 130 million could face acute food insecurity by the end of 2020.

Another plague, the outbreak of desert locusts in East Africa, Middle East and southwest Asia is still not under control either. According to the FAO, the situation remains alarming in Ethiopia, Kenya and Somalia, a region where millions of people already face acute food insecurity.

Agro-climatic conditions

According to the analyses presented in Chapters 1 and 3.1, prevailing climate conditions during the current 2020 JASO reporting period were close to normal for cropland. Average temperatures, rainfall and photosynthetically active solar radiation stayed close to the 15-year average. No prolonged heat wave in any of the major production countries was observed during this period.

At the global scale, the series of record or close to record high temperatures continued throughout this monitoring period: July and August ranked as 2nd, September as 1st and October as the 4th warmest respective months in past 141 years. For the months from January to October, this was the second warmest period on record. The temperature departure was +1.0°C above the 20th century average.

Overall, the prospects for crop production were quite favorable, mainly because no prolonged, large scale droughts were observed. In many regions, the crops benefitted from the above average rainfall that had

been recorded for the previous monitoring period. The stored soil moisture helped sustain crop growth, even when precipitation was below average. Below average rainfall was recorded for Central and South America (-14%) and North America (-11%), mainly in the Western USA. Conditions were drier than usual in Europe as well (-6%). Above average rainfall was recorded for Central Asia (+20%) and East Asia (+19%). The latter started this monitoring period under drought conditions, but a series of typhoons and tropical depression brought large amounts of rainfall to that region. Conditions turned back to normal in Oceania as well, where rainfall was 8% above average.

The following is a summary of the conditions in the key production regions:

- North America: Production conditions were generally favorable for maize and soybean. Harvest benefitted from slightly drier than usual conditions. US maize (+2%), rice (+2%) and soybean (+2%) production is estimated to increase. A reduction by 3 % is expected for wheat. In Canada, soybean production remained at the same level as last year, whereas wheat increased by +5%.

- South America: Wheat production in Brazil was favorable (+3%), but Argentina suffered from drought conditions (-16%). A delay in the onset of the summer rains delayed sowing of maize and soybean in Brazil. La Niña may cause further rainfall deficits in Brazil and Argentina in the coming months.

- Europe: Rainfall was generally on the dry side. Production of summer crops was slightly below normal.

- Africa: Abundant rainfall benefitted the crops in the Horn of Africa and West Africa. Wheat in South Africa also benefitted from favorable weather conditions

- Eastern Europe to the Ural: Romania, the northern Caucasus and Volga regions of Russia, as well as the Ukraine suffered from a rainfall deficit which caused reduced yields of the summer crops.

- Siberia and Kazakhstan: benefited from above average rainfall and above average wheat yields were harvested in that region.

- China: It generally benefitted from abundant rainfall and production slightly increased over last year's levels: Maize production is estimated to increase by 0.8%, wheat by 2.9% and soybean by 0.9%. Rice production remained stable (-0.2%), despite of the heavy floods in the Yangtze river basin in early summer. The north-east was hit by 3 typhoons, causing wind damage and local floods affecting about 1 million ha of maize.

- South Asia: India, as well as Pakistan benefitted from favorable monsoon rains and rice production increased by more than 6% in both countries. Bangladesh, on the other hand, experienced severe floods and production is expected to decrease by 6%.

- South-East Asia: This region recovered from the drought conditions. Several typhoons, most of them hitting the area just after harvest of the main rice crops, brought plenty of rainfall to the region. Production is estimated at average levels.

- Australia: Especially the south-east recovered from last year's severe drought and a sharp increase by 8.57 million tons (+44.3%) from 2019 is estimated for wheat.

In 2020, global maize production is expected to be at 1.070 billion tons, an increase of 1.4% or equivalent to 15.15 million tons; global rice production is expected to be 760 million tons at an increase of 0.9% or an increase of 6.80 million tons; global wheat production is 738 million tons, an 3.1% increase of 21.98 million tons; global soybean production is expected to be 323 million tons, a slight decrease of 0.2%. In 2020, the global production of the major cereals and oil crops will be generally stable.