Commodity
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Report

North Korea MY 2022/23 Seasonal Crop Outlook

In North Korea, the marketing year (MY) 2022/23 summer crops have progressed well throughout the season. The rainy season typically starts in April and about 80 percent of the annual precipitation, on average, occurs between July and September. This year's growing season began with beneficial soil moisture conditions, and the rainfall outlook continued to be favorable for planting, crop establishment, and reproduction during May to August. The conditions have continued to raise yield expectations from average to above-average for the major summer grown food security crops, corn and rice. Rice, corn, and soybeans are at advanced maturity and harvest stages (Figure 1). The main season (April – October) crops include rice and corn, accounting for almost 90 percent of the total crop output, plus small quantities of soybeans, potatoes, millet, and sorghum (Figure 2). Rice is predominantly produced in the western provinces of South Hwanghae (28%, Hwanghae-namdo), North Pyongan (22%, P'yongan-bukto), South Pyongan (20%, P'yongan-namdo), and South Hamgyong (11%, Hamgyong-namdo). The southern, southwestern, and western provinces are considered the "cereal bowl regions" (Figure 3). In recent years, potatoes have emerged as a staple crop next to rice and corn, contributing about 8 percent to the annual output of food crops. Conversely, wheat and barley are mainly winter crops with a small amount planted in early spring; wheat and barley contribute approximately 2 percent to total annual food production.   In addition to the favorable crop outlook, particularly for rice and corn, according to North Korea's Ministry of Agriculture, new land has been brought under production through such projects as river improvements, straightening of waterways, land reclamation, and relocation of public buildings.
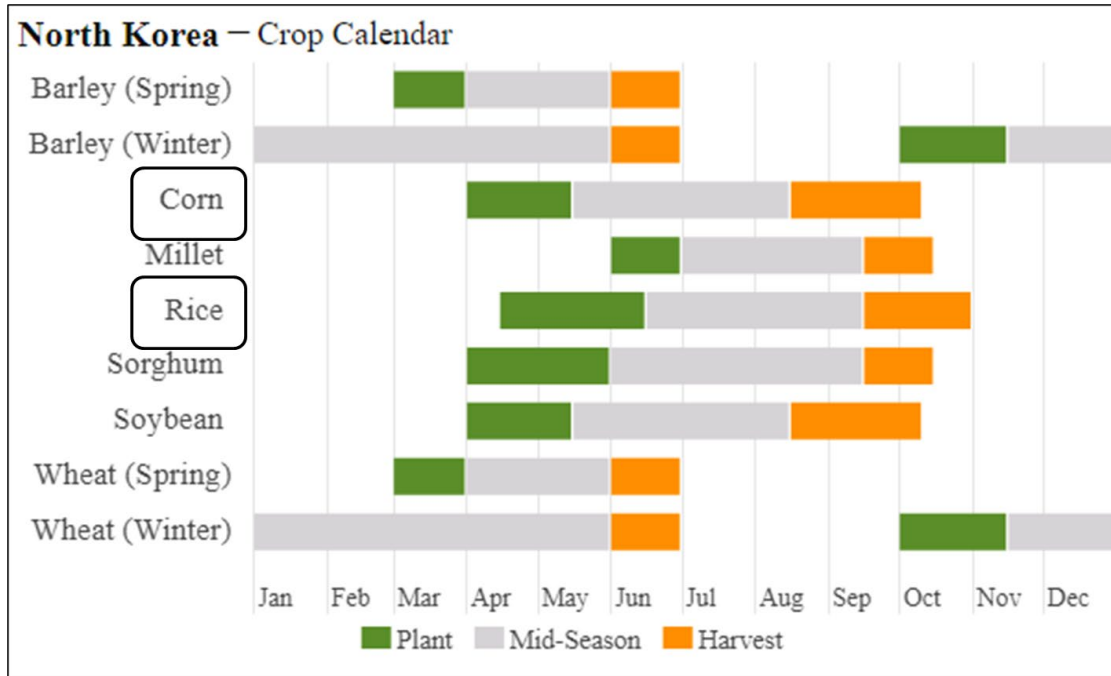
USDA forecasts MY 2022/23 North Korea rice production at 2.1 million tons(rough basis) and rough rice yield of 4.18 tons per hectare (t/ha). The current rice yield forecast is almost 12 percent below the 5-year average of 4.76 t/ha (Figure 4). The lower yields are primarily due to expansion of rice planted area in marginal lands and poor capacity to import much-needed agricultural inputs, such as improved hybrid seeds and fertilizers, due to economic sanctions and the two-year COVID-19 border closing with China. Rice planted area is up approximately 3 percent from the 5-year average.

USDA forecasts MY 2022/23 North Korea corn production at 2.3 million tons. The current corn crop outlook for North Korea indicates a forecast yield of 3.93 t/ha, which is almost the same as the long-term average expectation.   Both rice and corn forecasts incorporate current satellite-based observations of soil moisture conditions and crop growth based on the NDVI (Normalized Difference Vegetation Index), as well as the seasonal rainfall

outlook based on various agro-climatological sources. For example, in Hwanghae-namdo (Hwanghae south), which accounts for roughly 30 percent of rice production, crop conditions are above average and slightly above last year (Figures 5, 6). There is, however, some variation within the country's cropping regions. Based on favorable seasonal rainfall and average soil moisture, most parts of North Korea's western cropping regions have an increased likelihood for this year's rice and corn crop to be above the long-term average, while some parts in the Central region and Northeast have an increased chance for an average crop.

In June and July, the rainfall and soil moisture conditions were generally favorable, ranging from normal to moderately wet across the major crop growing regions (Figures 7, 8). The beneficial early season growing conditions are projected to have encouraged further summer crop plantings across most parts of North Korea's cropping region.The soil moisture conditions continued to be adequate into August and September during advance reproductive crop stages ensuring a good finish to the crop (Figures 9, 10). All indications are that rainfall during June, July, and August was sufficient to fully recharge irrigation water reservoirs, coupled with significant carry over water levels from the 2021 season. Further evidence is also provided by the European Commission's Monitoring Agricultural Resources (MARS). MARS indicates that prospects are favourable for rice and corn, to be harvested in October and September, respectively, as crop biomass is average to above-average in all provinces. Throughout the 2022 season, MARS issued no anomaly hotspots of agricultural production (ASAP) (Figure 11). MARS states that with average to above-average rainfall, adequate soil moisture, and temperatures in the last three months, conditions have been favorable for corn and rice crops across the major production regions. Approximately 80 percent of total cereal is produced in Hamgyong-namdo, Hwanghae-bukto, Hwanghae-namdo, P'yongan-bukto, and P'yongan-namdo. So far, none of these major production regions have been flagged with anomaly hotspots.
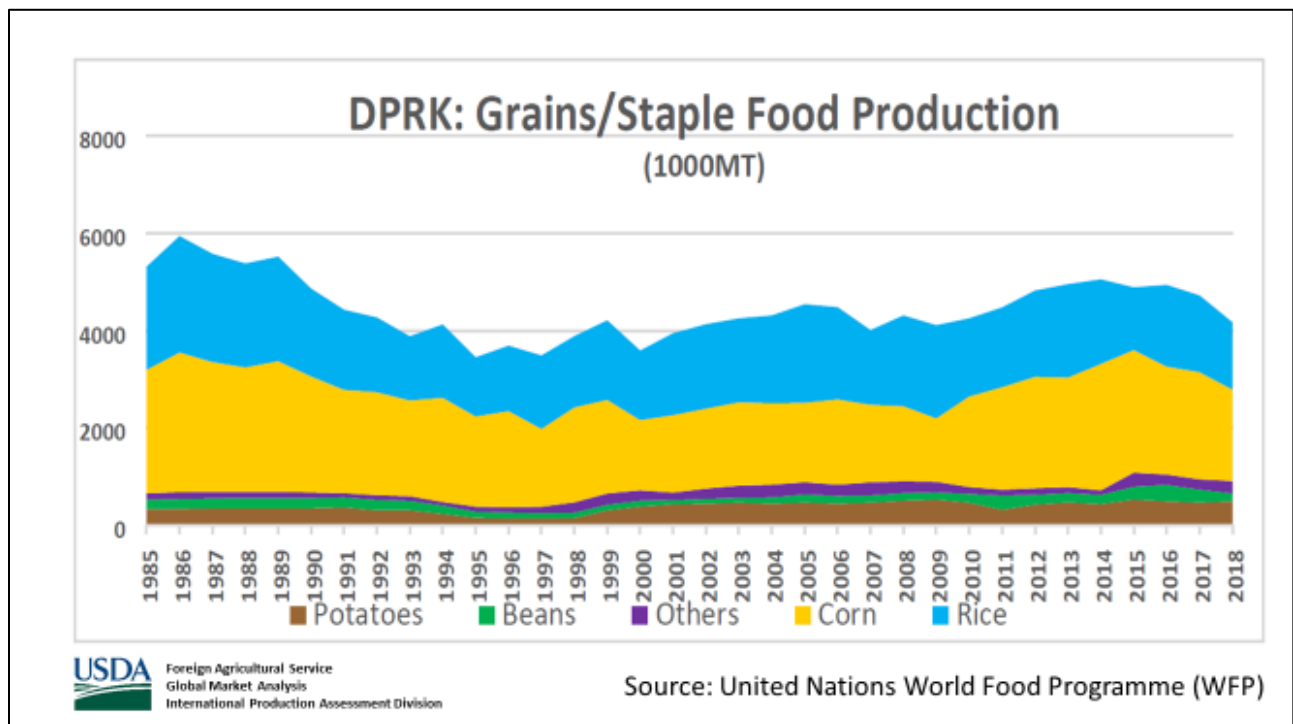
In summary, with the major food crops in advanced reproductive-to-maturity stages, the productivity prospects remain favorable barring major weather disruptions. Widespread favorable conditions during the remainder of the season across all parts of the country's cropping regions should induce favorable end-of-season crop results. It is also important to keep in mind that food production and food security in North Korea, beyond weather and agricultural conditions, is dependent on a wide range of changing political and social-economic factors. Many of these factors are poorly understood, which presents challenges in the timely and accurate prediction of crop production. Over the years, it has generally been recognized that in North Korea the food security situation is to a large extent influenced by the dynamics at the border with China and by continued international economic sanctions. Since 2020, according to the World Food Program (WFP), borders were fully closed and in-country labor mobility was severely restricted to prevent the spread of the COVID-19 virus. This resulted in severe import restrictions of food, farm inputs such as fertilizers, improved seeds, farming equipment, machinery spare parts, as well as humanitarian aid. The circumstances make it difficult to predict with certainty how these variables may impact the final crop harvest results. Overall, however, crop productivity is expected to be near-to-above average.

Figure 1. Major food crops, corn and rice, at advanced maturity and harvest stages in North Korea

**Figure 2. Corn and rice are the major staple food production crops for DPRK (North Korea).
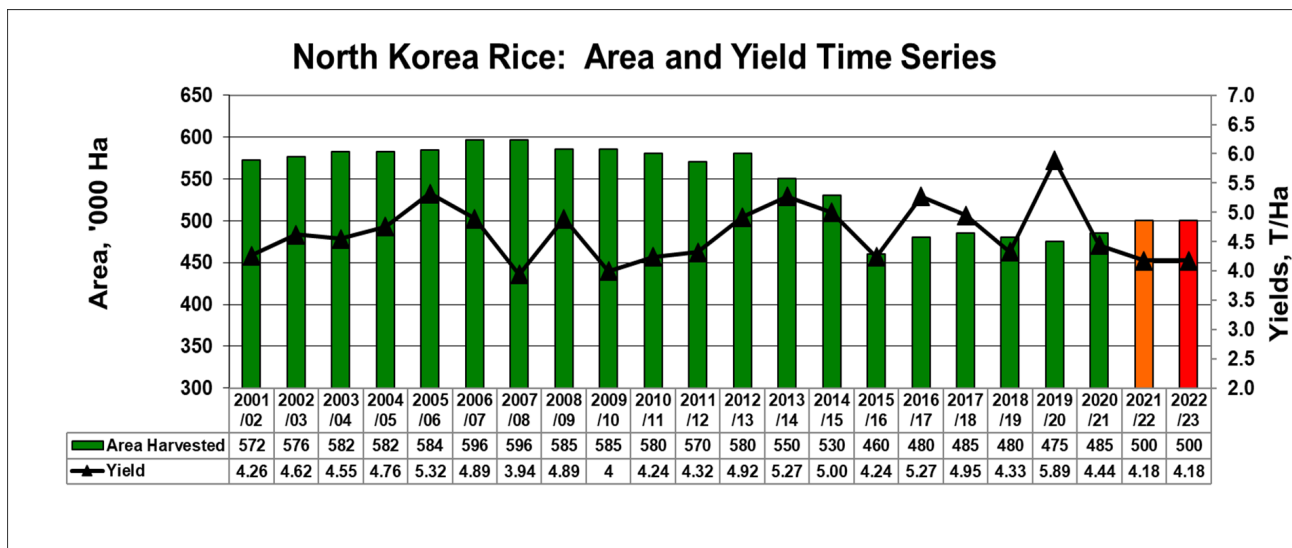Source: World Food Programme**

North Korea: Rice Production
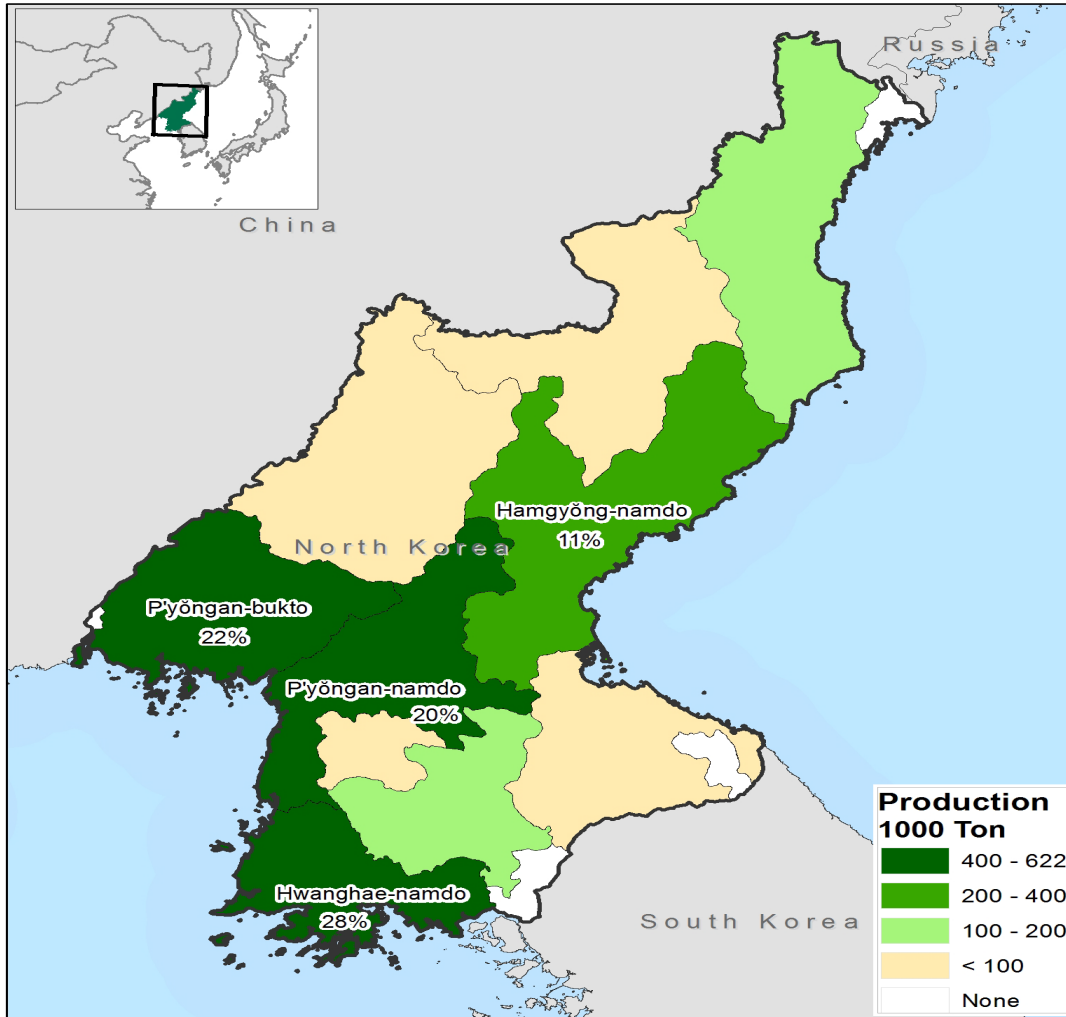
Source: FAO and WFP. 2019.
Average Crop Production of 2017-2018

Foreign Agriculture Service
Office of Global Analysis
International Production Assessment Division

Production 1000 Ton
- 400 - 622
- 200 - 400
- 100 - 200
- < 100
- None

Figure 3. The western provinces are considered the "cereal bowl regions" The map shows the percent proportion of rice produced in the western provinces. Similar trends are true for corn and other major staple food production crops. Source: USDA Foreign Agricultural Service

North Korea Rice: Area and Yield Time Series

	2001 /02	2002 /03	2003 /04	2004 /05	2005 /06	2006 /07	2007 /08	2008 /09	2009 /10	2010 /11	2011 /12	2012 /13	2013 /14	2014 /15	2015 /16	2016 /17	2017 /18	2018 /19	2019 /20	2020 /21	2021 /22	2022 /23
Area Harvested	572	576	582	582	584	596	596	585	585	580	570	580	550	530	460	480	485	480	475	485	500	500
Yield	4.26	4.62	4.55	4.76	5.32	4.89	3.94	4.89	4	4.24	4.32	4.92	5.27	5.00	4.24	5.27	4.95	4.33	5.89	4.44	4.18	4.18

USDA Foreign Agricultural Service / Global Market Analysis / International Production Assessment Division

Source: USDA/FAS PS&D Online

Figure 4. The current rice yield forecast is almost 12 percent below the 5-year average of 4.76 t/ha. In recent years the declining yield trend is primarily due to expansion of rice planted area in marginal lands and poor capacity to import much-needed agricultural inputs such as improved hybrid seeds and fertilizers due to economic sanctions and the two-year COVID-19 border closing with China. Source: USDA Foreign Agricultural Service
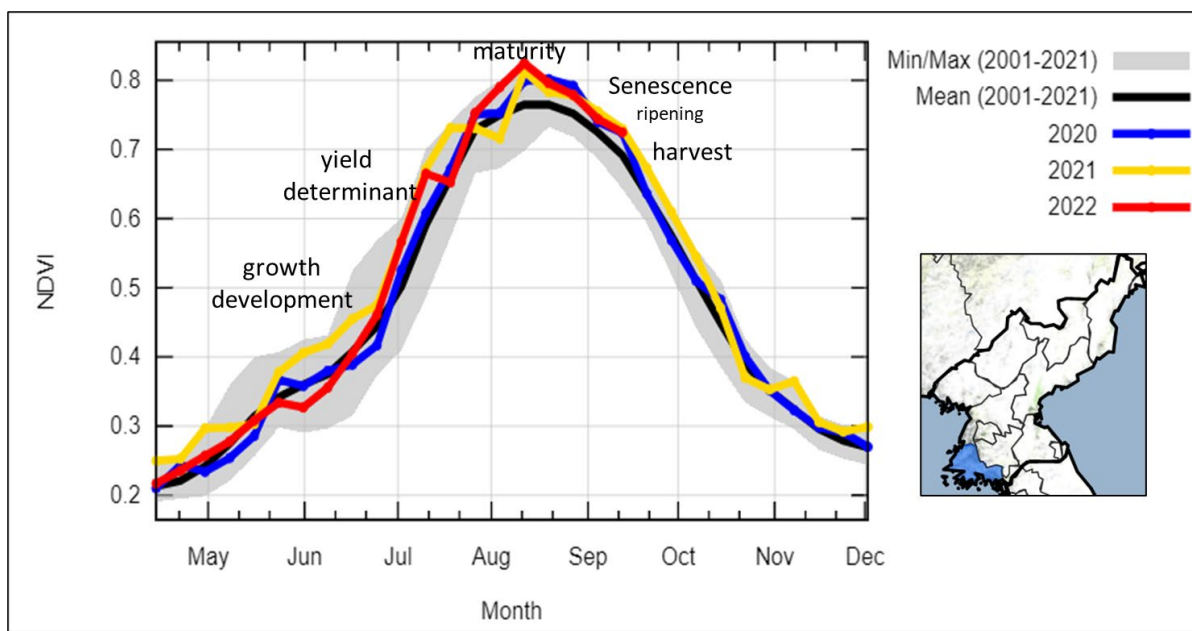

Figure 5. NDVI (Normalized Difference Vegetation Index) time series for South Hwanghae province (Hwanghae-namdo). The NDVI graphs indicate favorable crop performance for 2022 relative to the long-term average. Source: USDA/NASA GLAM, MODIS 8-day NDVI
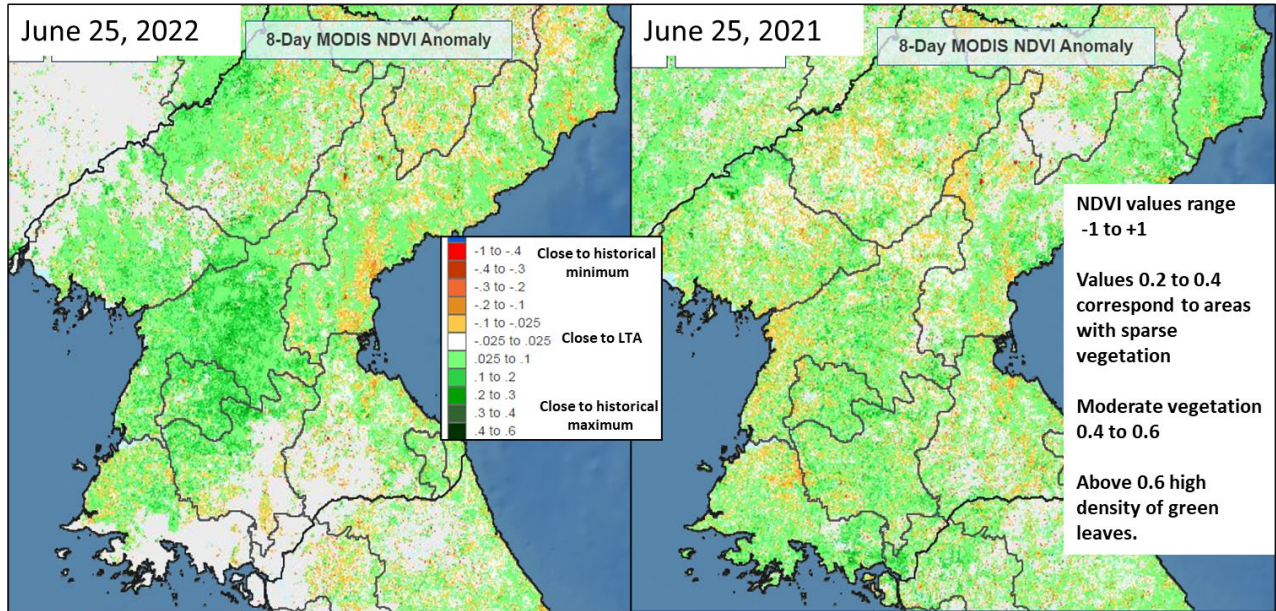
Figure 6. North Korea NDVI map (Normalized Difference Vegetation Index) map for the month of June 2022. The MODIS NDVI anomaly map shows the relative index of crop and vegetation conditions and productivity. The greeness (vegetation index) is an important indicator of plant health and crop performance. The maps indicate favorable crop status for the 2022 season relative to the long-term average. Source: USDA/NASA GLAM, MODIS 8-day NDVI
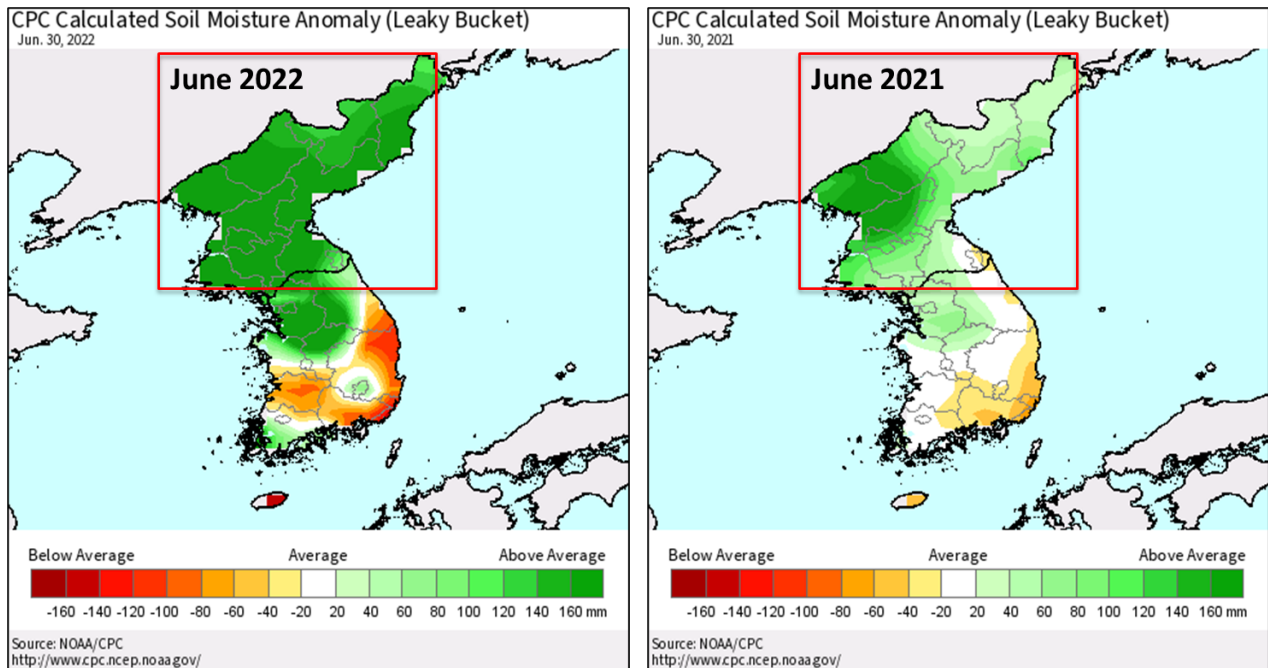
Figure 7. June soil moisture measurements and observations show favorable conditions across the major cropping regions in North Korea. Source: NOAA Climate Prediction Center (CPC)
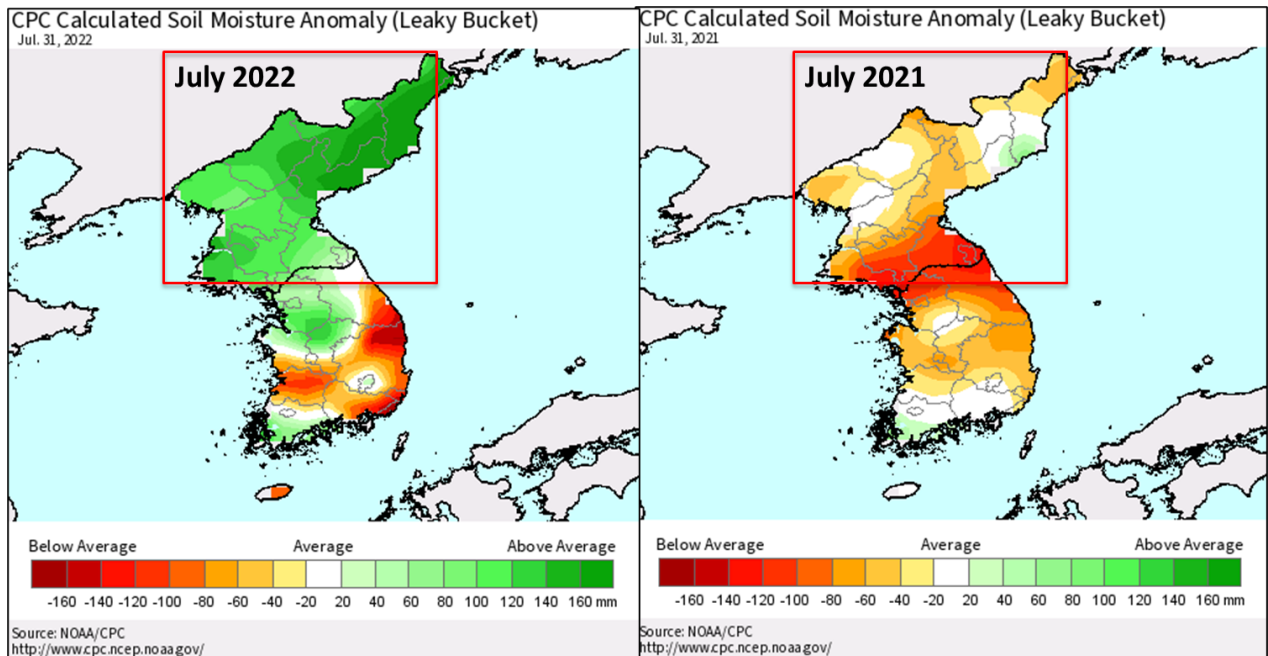

Figure 8. July soil moisture measurements and observations show favorable conditions across the major cropping regions in North Korea. Source: NOAA Climate Prediction Center (CPC)
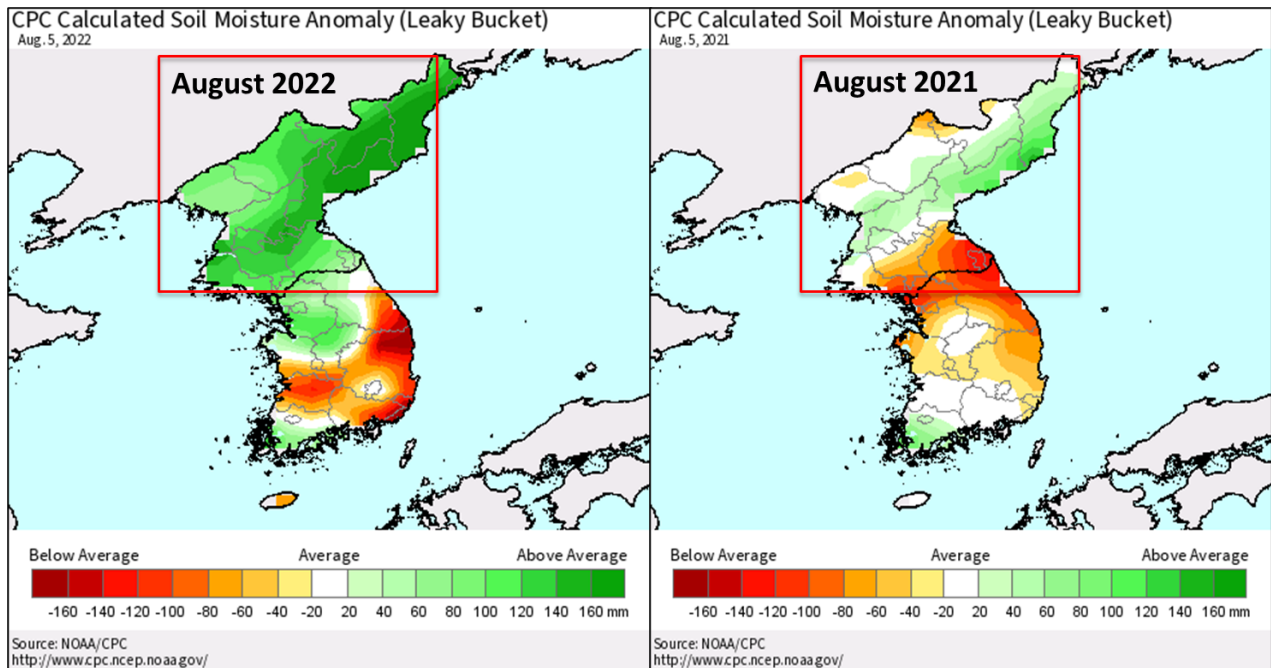
Figure 9. August soil moisture measurements and observations show favorable conditions across the major cropping regions in North Korea. Source: NOAA Climate Prediction Center (CPC)
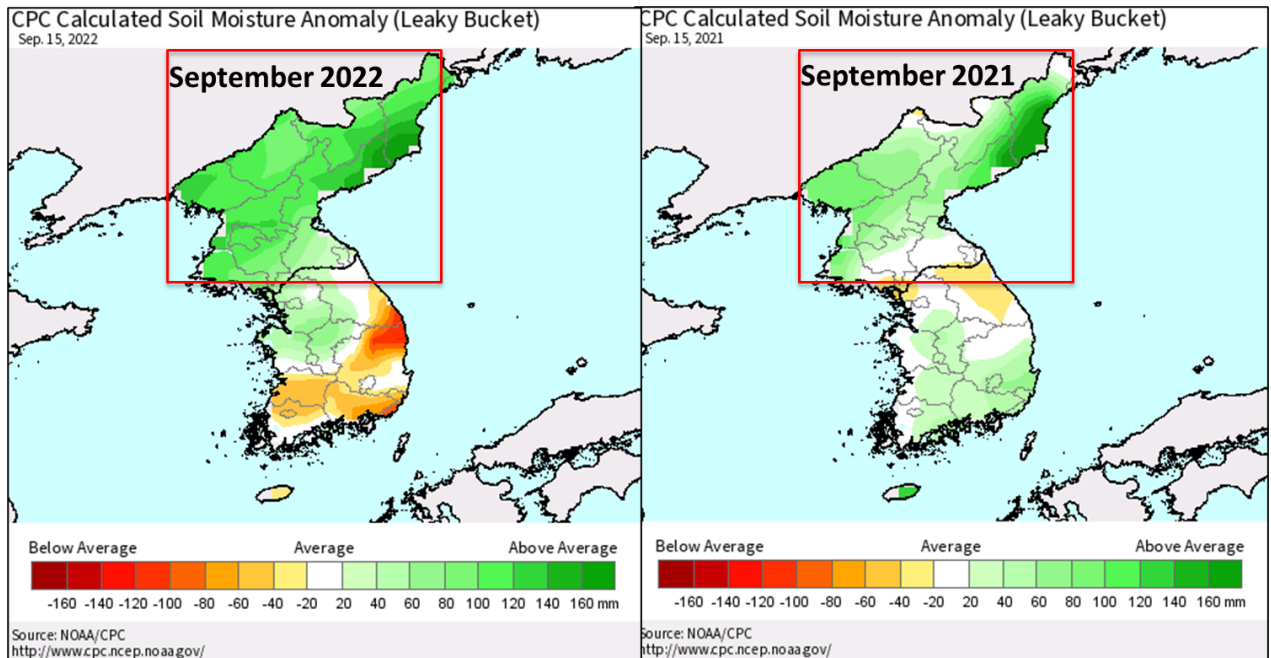

Figure 10. September soil moisture measurements and observations show favorable conditions across the major cropping regions in North Korea. Source: NOAA Climate Prediction Center (CPC)
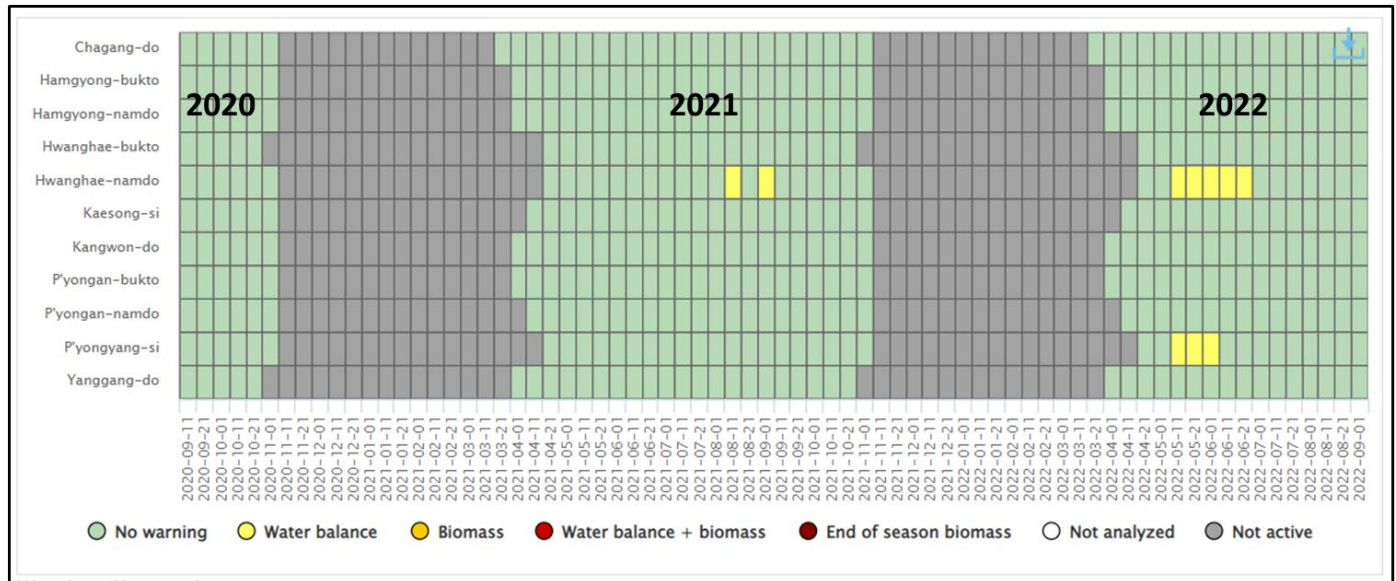
Figure 11. North Korea Anomaly Hotspots of Agricultural Production (ASAP) warnings time series. The matrix offers a table view of the history of the warnings in the two years preceding September 10, 2022, for each of the subnational units in North Korea. The table columns are the 10-day periods, the table rows are the subnational levels. The color of each cell corresponds to the warning levels:

-Water balance: water deficit possibly evolving in poor growth
-Biomass: evidence of poor growth
-Water balance + biomass: poor growth and negative prospects
-End of the season biomass: poor season growth: described at the bottom of the matrix.

Source: European Commission, EU Science Hub ASAP Country Assessment

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For more information and to access FAS databases and reports please visit:

Current World Agricultural Production Reports
https://www.fas.usda.gov/data/world-agricultural-production

Production, Supply and Distribution Database (PSD Online)
https://apps.fas.usda.gov/psdonline/app/index.html#/app/home

Global Agricultural Information Network (Agricultural Attaché Reports)
https://www.fas.usda.gov/databases/global-agricultural-information-network-gain

Crop Explorer
https://ipad.fas.usda.gov/cropexplorer/

Global Agricultural and Disaster Assessment System (GADAS)
https://geo.fas.usda.gov/GADAS/index.html