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The Canadian Agriculture Weather Prognosticator

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World Weather At A Glance

- U.S. Midwest is drying out and crop stress may soon threaten corn yields as the pattern prevails.
- Northern Europe is drier than usual and some crop moisture stress has begun to evolve
- Eastern Russia's New Lands and northern Kazakhstan are too dry and rain must fall soon to protect sunseed and spring wheat
- Portions of Northern China are expected to dry out over the next week to ten days raising some concern for crops north of the Yellow River
- Australia winter wheat, barley and canola are establishing well
- India's monsoon is performing poorly with little change until late this month
- Argentina wheat areas still need significant rain
- North Africa rains have ended

Rain This Week To Revitalize Alberta Crops

Withering crops in Alberta are facing certain death if rain does not fall this week—at least in some of the driest areas. Some of the critically dry areas came into spring with just a thimble full of moisture and a couple of timely rain and snow events that provided planting moisture. Planting then took place and crops emerged on limited soil moisture and some timely, but light showers.

Recent heat depleted topsoil moisture and crops have been struggling ever since because there is no subsoil moisture. Upper 20– and lower 30-degree Celsius daily high temperatures zapped every bit of the lingering moisture from the soil and that is when crops started showing their stress. Rain must fall in this coming week to stop the decline in potential yields for many crops.

The good news is that a dominating ridge of high pressure that has been wandering back and forth across the Prairies in recent weeks is about to be ejected out of the region. The ridge will be replaced by a succession of low pressure troughs that will drop into the region from British Columbia. Each trough of low pressure will bring its own pool of cooler air and at least a small supply of atmospheric moisture. The arriving cool air intermixing with the dominating warm air over the Prairies and the little bit of moisture coming with the troughs of low pressure should be sufficient enough to bolster topsoil moisture just enough to revitalize crops in the driest areas.

There is some potential for high pressure to return to western Canada later this month or in July, but changes in world weather patterns should limit the duration of any returning high pressure ridges in the Prairies.

Today's high pressure ridge will relocate over the central U.S. Plains with some influence on the western Midwest Corn and Soybean Belt at times. This position is considered "normal" for this time of year and that may help the ridge stay in the general vicinity.

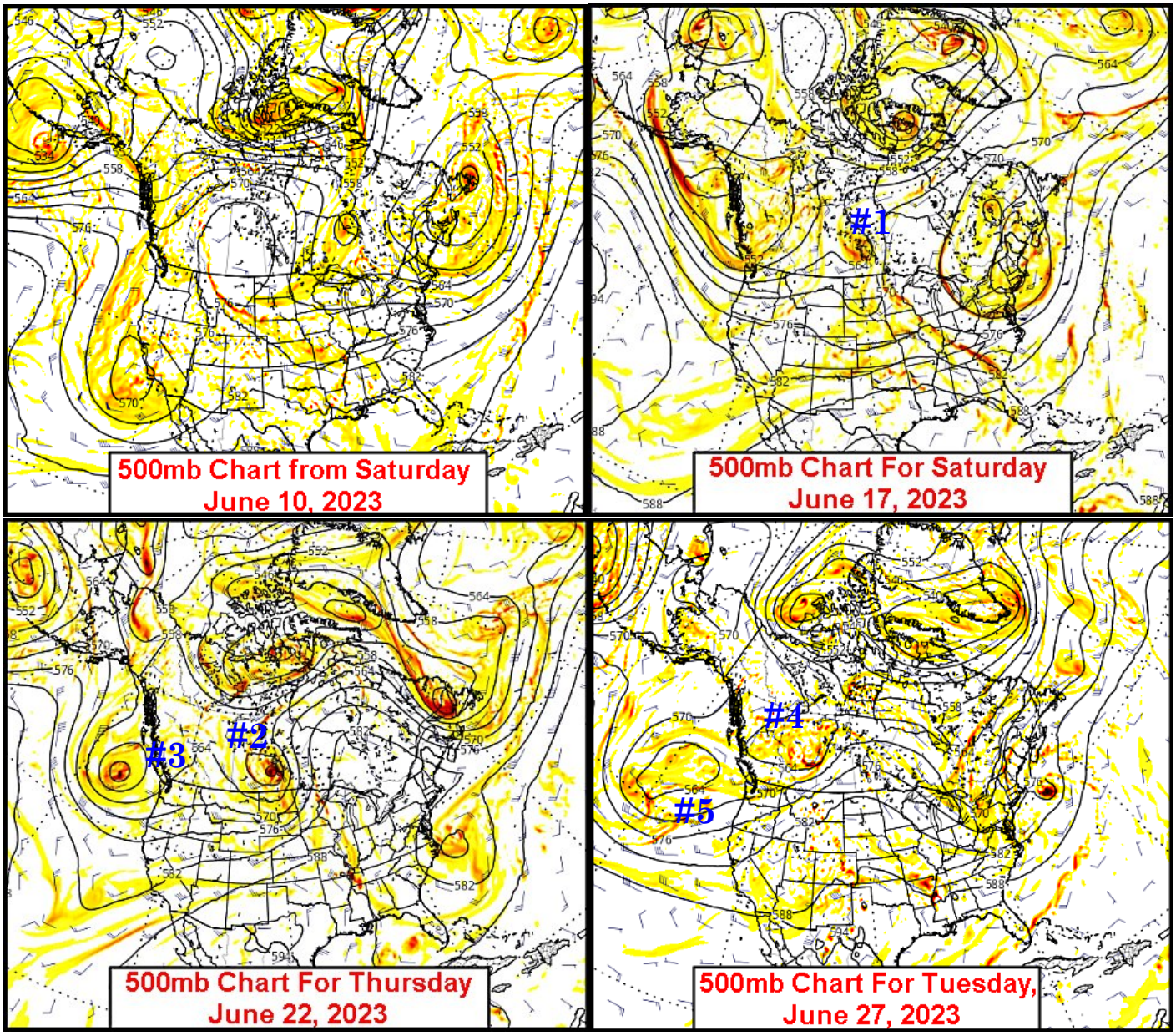
Relocating the high pressure ridge to the U.S. central Plains opens the door of opportunity for weather systems coming into the U.S. Pacific Northwest to move up the back side of the high pressure ridge into the heart of the Prairies.

The odds are relatively good that rain will begin falling much more routinely across the Prairies and with amounts that will slowly ramp up over time easing long term dryness in many areas. There is still some concern that rainfall may become a little too frequent and too significant later this summer and a close watch will be warranted. It would not be surprising to see some waves of heavy rain across the region from southeastern Alberta through central Saskatchewan to a part of northern and west-central Manitoba.

Unfortunately, the greatest rain intensity and frequency may not fully kick in until late summer and that could raise the potential for crop quality concerns and some worry over harvest delays in the late summer or early autumn. Despite, that concern the need for rain far outweighs any other concern right now and the odds are certainly looking more favorable for the needed change to occur as described here.

Even though there are

Rain To Revitalize Alberta Crops (continued from page 1)



five storms identified to impact the Prairies over the balance of this month there is no assurance that each will bring significant moisture to all crop areas. The first storm or two must pass through the drought stricken areas of Alberta and when that happens the chronic dry air over that part of the Prairies will likely zap moisture from the air reducing the disturbances enough to reduce the precipitation potential to scattered showers of mostly light intensity leaving dryness an ongoing concern and some producers frustrated over continued dryness.

However, as each storm system moves over the drought region of Alberta a little more moisture will be left behind for the next storm system to use for rainfall. Over time, rain potentials should improve in the drought region.

Notice, in the above charts, the general absence of high pressure aloft over the western Prairies. That is a key change from the first graphic in the upper left corner of this page when high pressure aloft was producing very warm to hot temperatures while restricting rainfall.

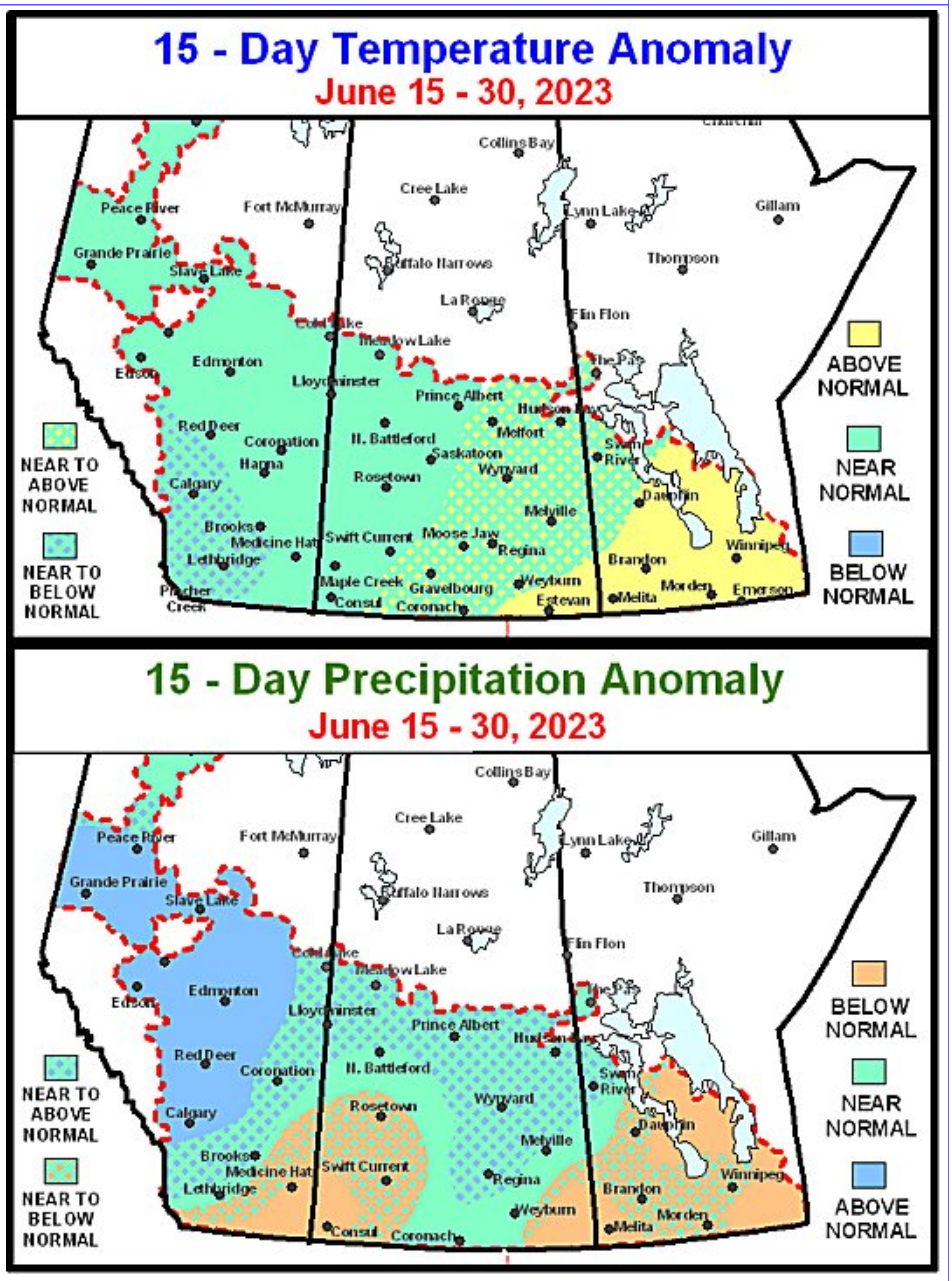
Even though there is potential for rain across the Prairies there are a few important things to note. 1) western Alberta may get too much rain during the balance of this week and through the weekend, 2) southern Manitoba and southeastern Saskatchewan may not get as much rain as they desire and 3) temperatures will briefly cool this weekend and especially next week.

Late June Rain Distribution Not Ideal; More Needed

Despite the enthusiasm and excitement over five weather disturbances lined up to move through the Prairies during the balance of this month, there is need for caution. The scenario is not ideal and there is room for some failed rain attempts.

Two primary problems with the outlook are 1) the Gulf of Mexico is not open as a moisture source for the Prairies and 2) southwestern U.S. monsoon moisture has not begun yet and is still a few weeks away. The limited moisture sources for the Prairies will make the development of "significant" rain more difficult to achieve. The general loss in rainfall predicted for Manitoba and southeastern Saskatchewan this month is largely attributed to the limited Gulf of Mexico moisture and to the stronger than expected high pressure ridge that moved from the U.S. Great Lakes region earlier this month to the heart of the Prairies in recent days.

Now that the ridge of high pressure is shifting out of the region rain potentials should improve, but Manitoba and southeastern Saskatchewan, like the U.S. Midwest will be moisture starved because of a lack of Gulf of Mexico moisture and the positioning of the high pressure ridge over Ontario, Manitoba and immediate neighboring areas of the western Great Lakes region and upper Midwest. This unexpected change has resulted in our failed rainy weather outlook for the southeastern Prairies this month.



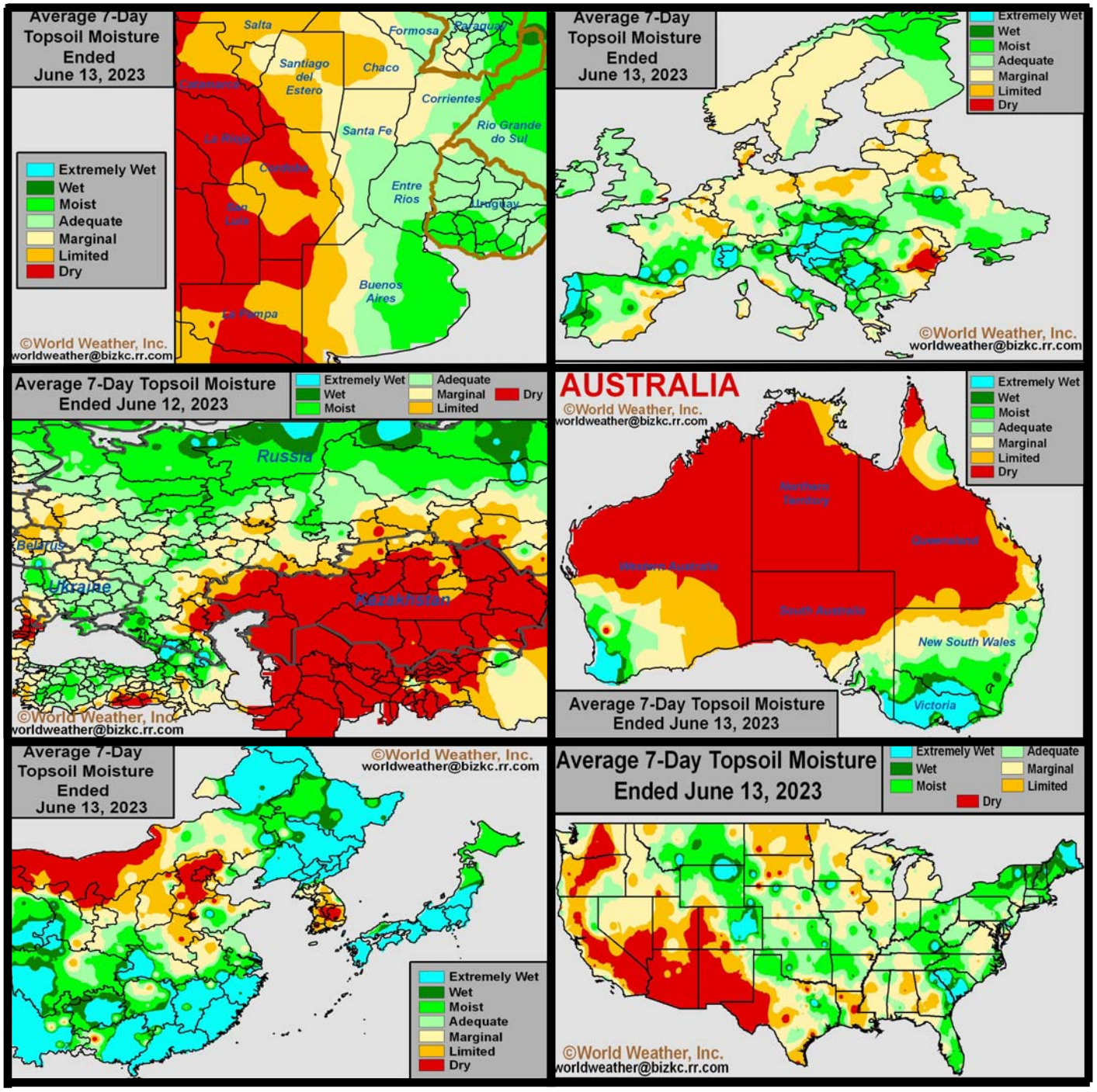
The coming week of weather will produce enough rain west of Alberta's Number Two Highway to induce some flooding rain. The pattern is similar to that which occurred two other times this spring and some areas will receive 1.00 to 3.00 inches of moisture resulting in some local flooding.

Far southeastern Alberta and far southwestern Saskatchewan will not likely get much rain of significance during the second half of this month, although parts of that region did receive rain earlier this month.

The lowest confidence part of the late June forecast is the greater than usual rain from Moose Jaw and Regina through Wynyard to Hudson Bay, Melfort and Prince Albert. There is a good chance that too much rain is being advertised for the region, but World Weather, Inc. believes there is potential for some strong to severe thunderstorms in that corridor which is the primary reason for the greater than usual rainfall between now and July 1. However, the rain could easily be much lighter and more sporadic putting that part of the outlook at risk of failure.

Dryness in Manitoba and southeastern Saskatchewan is expected to raise some new concerns over crop moisture stress since many of these areas are already quite dry. The ridge of high pressure will be a little too close in the coming week to allow much rain to fall and that will also keep temperatures above normal.

Selected Weather Images From Around The World



Wheat planting is under way in Argentina and recent moisture in the eastern production areas has the crop poised for quick emergence and good establishment. Western production areas; however, are still too dry. Australia's wheat, barley and canola continues to establish well, but that has not stopped the marketplace from worry over El Nino induced declines in production in the east this year. China is experiencing some expansion of dryness southwest out of eastern Inner Mongolia and will soon dominate areas north of the Yellow River. In the meantime, corn and soybeans elsewhere in the nation should develop well. Flooding in southern China rice and sugarcane areas the remainder of June may lead to some crop damage. U.S. Midwest weather is not ideal with parts of the Dakotas, Minnesota, Iowa, Illinois and Indiana too dry. In the meantime, drought in the central U.S. Plains has been eased. Dryness is still a concern in northern Europe and in eastern Russia's New Lands where rain must fall soon to protect production.

July, August Weather Should Trend Wetter

Despite all of the weather problems in North America today and those expected to continue into July there is still good reason to expect better weather in Canada's Prairies during July and August.

A weak ridge of high pressure is expected to be over the central United States that will extend into Canada periodically, but retreat periodically as well. This frequently changing pattern should provide support for periodic rainfall. Obviously, there will have to be an improved moisture source for the central parts of North America and that should evolve during July and August.

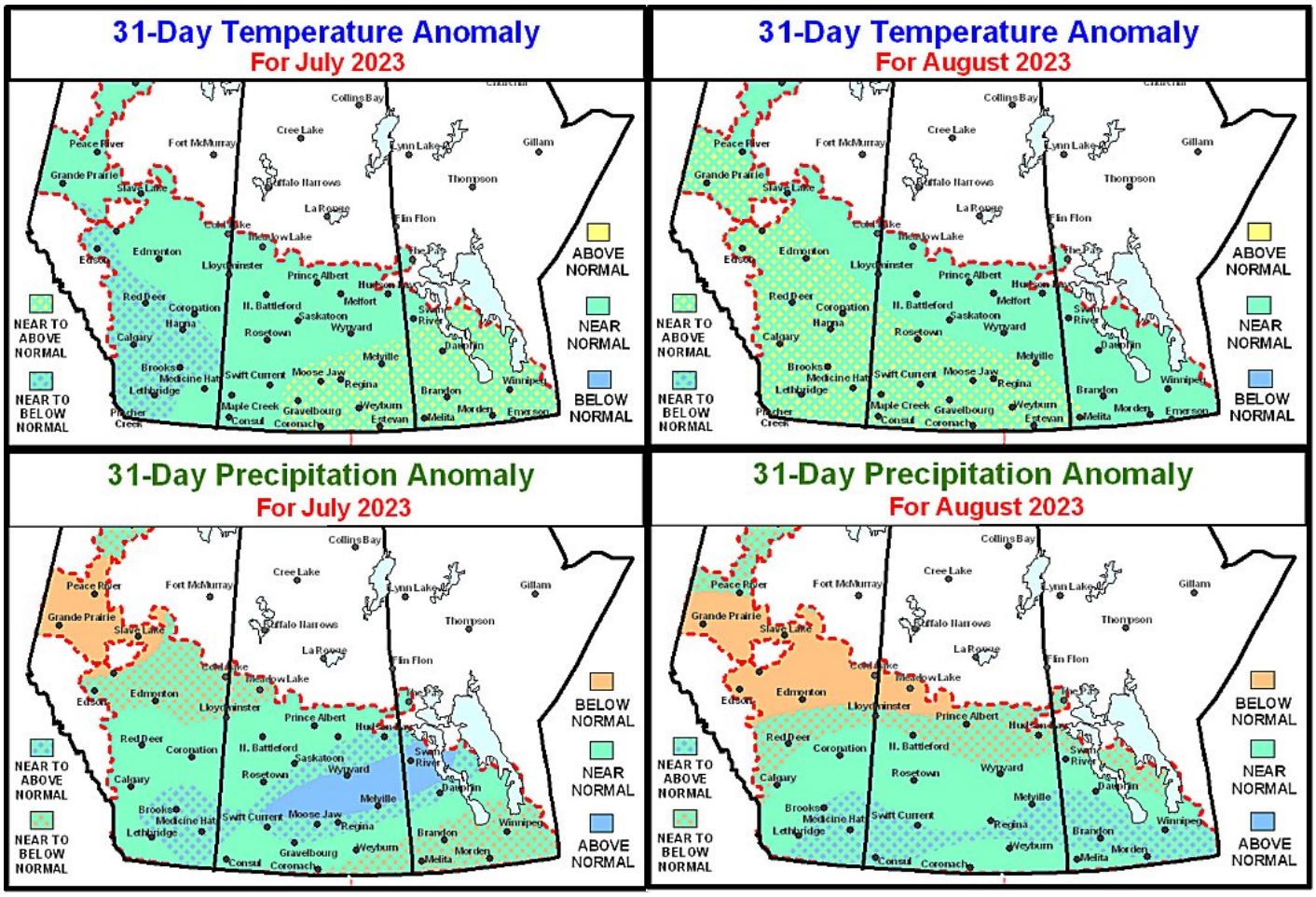
The Gulf of Mexico should open as a moisture source for the eastern half of North America during the heart of summer. That moisture feed should help raise the potential for rain in the Midwest and southeastern Canada's Prairies.

Another source of moisture will come from the southwest U.S. monsoon. That flow pattern brings moisture northward from Mexico and spreads it into the U.S. Rocky Mountains. Sometimes, the southwest monsoon brings the moisture into Canada and the northern U.S. Plains and sometimes the moisture feeds through the central Plains and into the Midwest.

This year's southwest monsoon has been delayed and there is some worry about it being weak and short-lived this summer. If that happens the forecasts for July and August shown below may prove to be too wet in the Prairies. However, confidence is high that at least some of that moisture will help to support rain in the Prairies and a close watch on the moisture feed is warranted to better determine when the best rainfall will evolve.

Temperatures in July and August will be mostly in a seasonable range. There is some potential for cooler biased conditions in southwestern Alberta in July and in the eastern Prairies during the latter part of August. World Weather, Inc. is still a little concerned about the potential for cold weather at the end of August and/or early September and will be investigating that further in the next few weeks.

In the meantime, the hottest part of summer in the Prairie should be passing now. There will be some bouts of warmth later this summer, but the heat will not be as anomalous or as persistent as it has been in recent weeks. Northwestern Alberta does have potential to run a little too dry this summer.



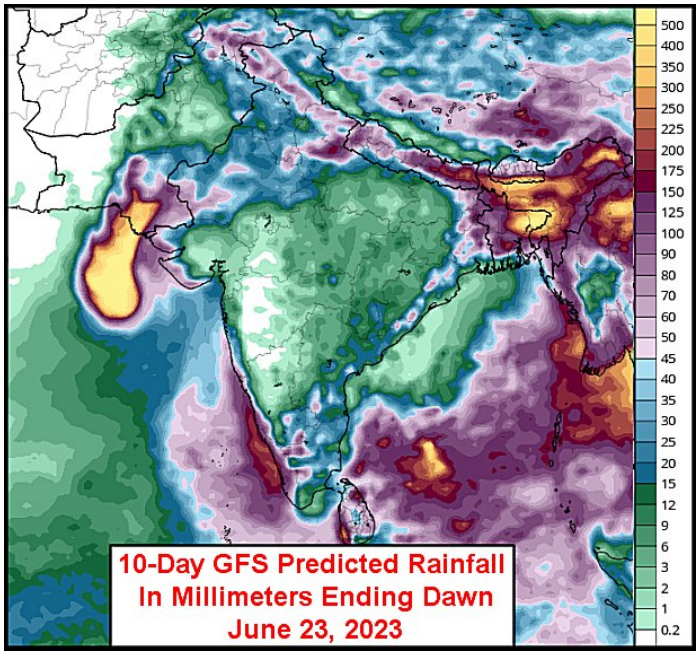
Indian Monsoon Rain To Remain Poor Another Ten Days

A Madden-Julian Oscillation pulse at the end of May and early June initially restricted monsoonal rain for India. The evolution of Tropical Cyclone Biparjoy also helped limit early-season monsoonal rain for the country. The need for good early-season precipitation was important as the country potentially braces for below normal rainfall this season due to El Nino. Sea surface temperatures in the equatorial Pacific Ocean recently warmed enough for El Nino to officially begin. An El Nino environment tends to suppress rainfall during India's monsoon season.

Early-season planting is underway in southern India and neighboring areas despite the slow start to the monsoon season. There has been enough rain to support some establishment and early-season growth. Bangladesh and the Eastern States have plenty of moisture to support aggressive rice planting and new growth as well outside areas impacted by flooding. Recent rainfall in northern and western India may have also helped support some planting, though much more rain is needed to support ideal long-term growth. Planted acreage may trend a little lower than normal due to the threat for below normal rainfall this season.

Precipitation will be highly variable across India the remainder of this week. Tropical Cyclone Biparjoy will move inland Thursday near the Pakistan/Gujarat border. The storm will then trek to the east southeast Friday through Sunday impacting crop areas from Gujarat and southeastern Pakistan through Rajasthan to Uttar Pradesh. Portions of western Gujarat and southwestern Rajasthan will receive 2.00 to 6.00 inches of rain with locally more by next Monday morning. Other areas will receive 0.25 to 2.00 inches of rain with local amounts of 4.00 inches or more in southern Rajasthan. Precipitation for both Gujarat and Rajasthan will then be limited June 20 – 26. Aggressive planting may begin during the second week of the outlook as producers try to take advantage of the moisture from Tropical Cyclone Biparjoy.

Southern India will see a mix of erratic monsoonal rain and sunshine this week. Precipitation will remain below normal due to Tropical Cyclone Biparjoy, though periods of significant rain will be possible over the weekend as the disturbance tracks further into India. Moisture totals by next Monday morning will range from 0.50 to 3.00 inches with locally greater amounts. These totals are still well below normal. The region will again have a few opportunities for erratic rain June 20 – 26. Planting and general fieldwork will advance around the precipitation. Establishment and early-season development conditions will be generally good outside the driest fields. However, long-term crop prospects are less than ideal due to the slow start to the monsoon season.



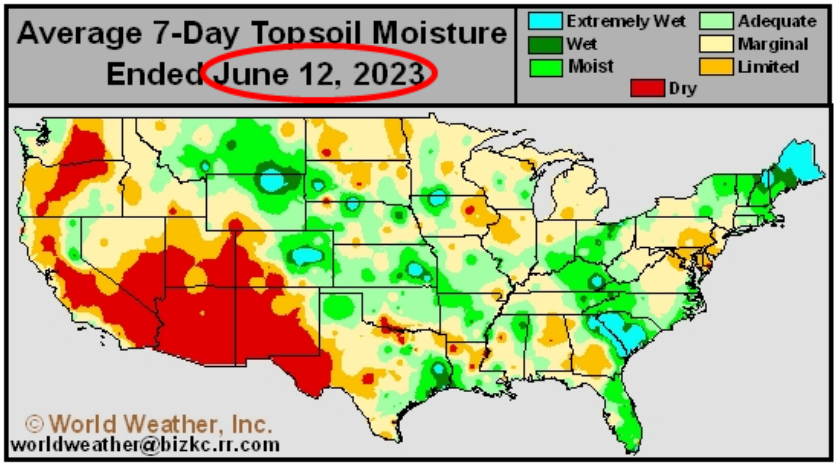
Bangladesh and the Eastern States will see several waves of rain this week. Rain will occur on a daily basis with some of the most significant rain occurring Wednesday into Saturday. Moisture totals by next Monday morning will range from 5.00 to 10.00 inches with local amounts of 15.00 inches or more in the Eastern States and northern Bangladesh. Drier pockets are also expected in southern Bangladesh. Significant flooding will be a concern this week and could damage some rice, sugarcane and other crops. Overall production impacts should be small.

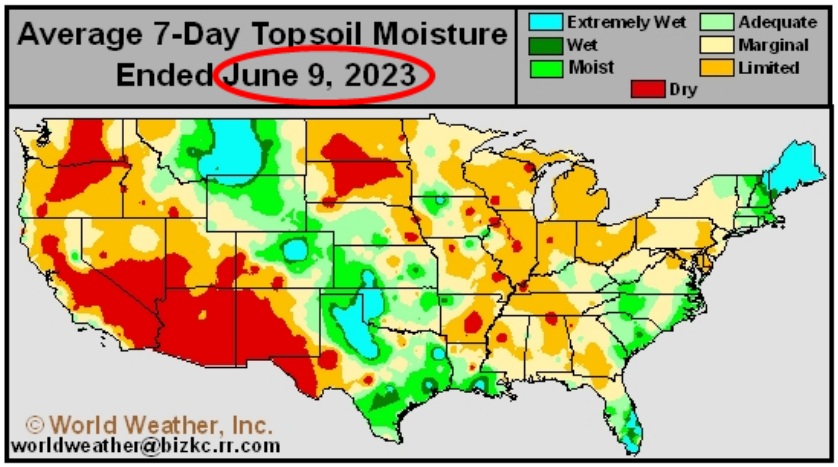
Northern India will see a good mix of rain and sunshine this week. Periods of light rain will initially occur through Wednesday. The close proximity of Tropical Cyclone Biparjoy will promote more widespread rain later this week and weekend. Moisture totals by next Monday morning will range from 0.25 to 2.00 inches with locally more. More significant rain will be possible June 20 – 26 as a more 'normal' monsoon pattern begins to evolves. Early-season planting and general fieldwork will advance swiftly around the precipitation. Establishment and early-season crop development will likely get off to a good start as well.

The remaining production areas in India will be dry or mostly dry this week. Periodic rain will likely occur in portions of central India, eastern India, and Maharashtra, though resulting rainfall will be lost to evaporation or too light to impact long-term soil conditions. Monsoonal precipitation will likely expand to these locations June 20 – 26 after Tropical Cyclone Biparjoy dissipates. The boost in rain during the second week will likely promote better planting prospects.

U.S. Midwest Still Needs Greater Rainfall

Showers and thunderstorms and milder than usual temperatures during this past weekend temporarily eased very dry topsoil conditions in many parts of the U.S. Midwest. More rain is expected to occur across the region in the next 7-days, although the driest areas of crop country will receive the lightest rain and experience the warmest temperatures. While any rain is welcome, the forecast amounts will not fully eliminate the 1.00 to 3.00-inch moisture deficits that are present across the region. A ridge of high pressure expected to develop over the region by June 21 will cause drier conditions to return putting more pressure on the coming week of rain to be sufficient enough to carry crops through the drier and warmer period.





Showers and thunderstorms that occurred over this past weekend improved topsoil conditions across most of the U.S. Midwest, but the region is still too dry from some perspectives. Short to very short topsoil moisture on Friday has improved to the marginally adequate and slightly short categories in the lower Midwest and to the slightly short category in the northern Midwest. However, portions of central and eastern Iowa and northwestern and central Illinois experienced very little change in the moisture profile leaving the topsoil too dry for the best crop development. Subsoil moisture is still rated marginally adequate to slightly short across most of the region suggesting there is not much moisture reserve below the top few inches of soil to carry crops if there is an extended period of drier biased weather.

The weekend rainfall was welcome and provided some immediate relief to dryness, but it was insufficient on its own to induce a sustainable improvement especially if dry and warm weather wanders back into the region without additional rain falling first. The need for significant rain is moderately high for all of the Midwest, but especially in the drier areas of Iowa, Illinois, the eastern Dakotas, western Minnesota and random locations from Michigan to northern Indiana as well as northern Missouri.

WEATHER OUTLOOK

Showers and thunderstorms are expected to continue in Ohio and western Pennsylvania. Rain will continue in waves across the region through the next 7-days. Over this period, 1.50 to 2.20 inches of rain is expected to occur in parts of eastern Ohio and western Pennsylvania. Between 0.40 and 0.90 inch of rain is expected in parts of Michigan, as well as west of central Indiana. Most other Midwestern locations will be dry or mostly dry.

A cool front will push across the eastern Dakotas and western Minnesota and extend southwest into Nebraska Thursday night and Friday. The frontal system will advance southeast across most of the Midwest Friday night through the weekend with highly varying amounts of rain expected. Most of the Midwest crop areas should get 0.25 to 0.75 inch of moisture with a few totals to 1.25 inches or more. That will be welcome moisture especially for the western Corn Belt that will be left mostly dry between now and then. However, a

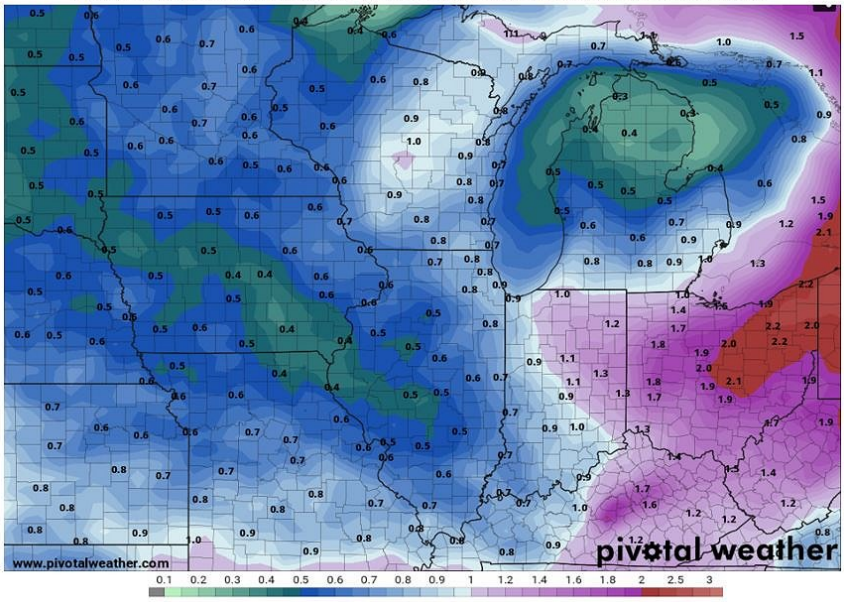
U.S. Midwest Still Needs Greater Rainfall (continued from page 7)

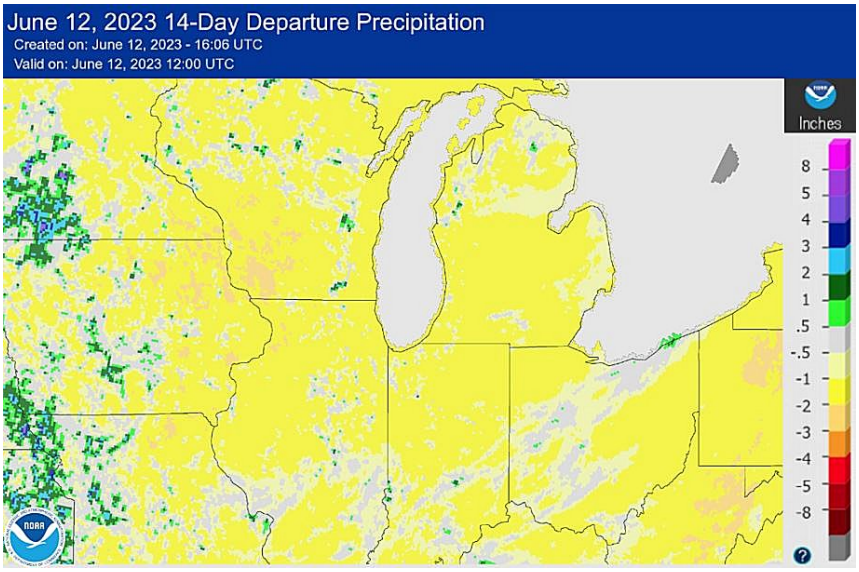
new ridge of high pressure is expected to evolve in the western and central parts of the Midwest around June 20-21 stifling precipitation and inducing a new round of warmer than usual weather.

The western Corn Belt moisture that occurs this coming weekend will not likely restore long term moisture deficits and even though a boost in topsoil moisture is expected the long term moisture deficits will remain leaving concern over the new ridge of high pressure and the last ten days of this month's weather. The eastern Midwest will likely do better with rainfall because of this week's rain and that which occurs late in the weekend and early next week.

Daytime temperatures are also expected to steadily increase in the coming days. By Wednesday, high temperatures from eastern Nebraska to Illinois will be in the upper 80s to low 90s (30-34C). Temperatures in this range may lead to as much as 0.50 inch of moisture loss through evaporation each day. Thursday and Friday may continue quite warm, but cooling is likely during the weekend as the previously mentioned cool front pushes through the region. High temperatures may cool to the upper 70s and 80s at that time. Another warming trend is expected early next week as the new ridge of high pressure evolves.

7-Day Forecast Precipitation Ending 0001 UTC Tuesday, June 20, 2023





CROP IMPACT

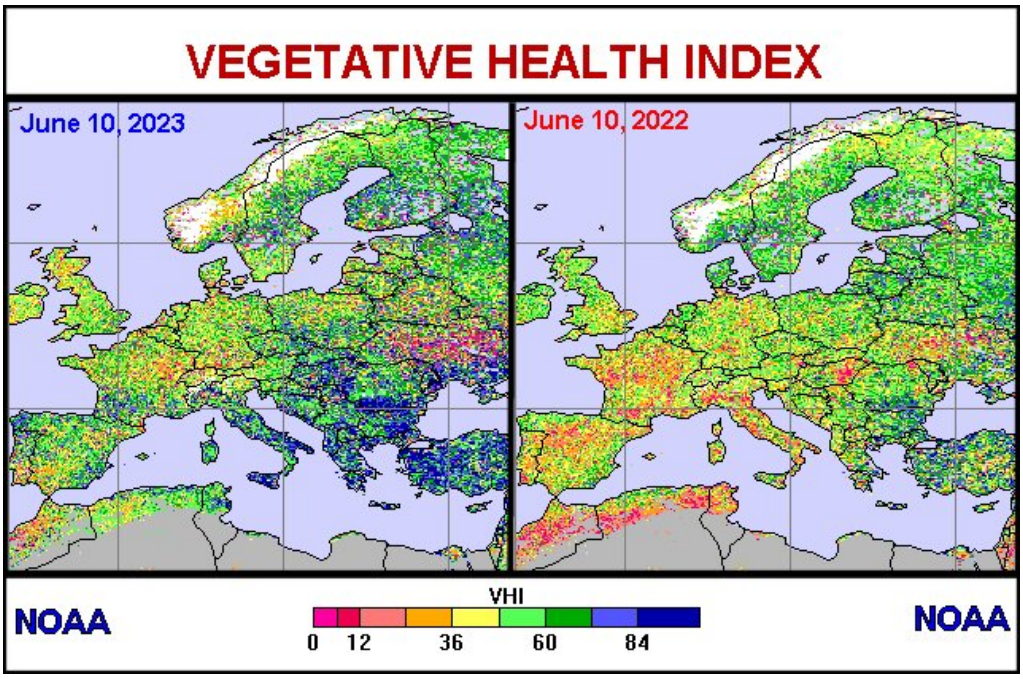
While any rain will be beneficial for the region, the western Midwest states will receive the least amount. The poor distribution of rain in the west coupled with temperatures in the upper 80s to lower 90s occurring late this week and again early to mid-week next week and continuing moisture deficits will lead to another round of significant crop moisture stress in Missouri, Iowa, western Illinois, and Wisconsin. These areas all need to see significant rainfall sometime soon to limit the impact of drier and warmer days and to support the best possible production.

Rainfall deficits are still largely between 1.00 and 2.00 inches for much of the Midwest, with some areas seeing up to a 3.00-inch deficit. If the forecast verifies, some improvement to the topsoil moisture situation is expected. However, the warm temperatures alongside an anticipated ridge of high pressure next week will likely create drying conditions leaving the long term moisture deficits in place and raise the potential for more crop stress.

One of the biggest problems with Midwest weather is the lack of moisture feeding northward from the Gulf of Mexico. This situation is not likely to change through the end of June.

Northern Europe Drying To Last Another Week

Portions of northern Europe have received little to no rain for more than a month, but temperatures have often been mild limiting the loss in soil moisture. More recently, though, some warming has occurred and the combination of low soil moisture, poor rainfall and warmer than usual temperatures has begun to raise the stress level for many crops.



According to the U.S. National Oceanic and Atmospheric Administration's (NOAA) Vegetative Health Index, only a few areas in eastern France are anywhere close to being as stressed as crops were last year. Last year a much larger part of Europe was not only dry, but hot and the pattern dominated much of the growing season. This year's milder temperatures in the past month have helped tremendously in reducing the impact of dry weather on crop development. That does not mean there has not been some stress, but it does suggest the impact of dryness is not nearly as serious as it was in 2022. Rain is still needed and the sooner it falls the better off crops will be since temperatures have recently begun to rise into the 80s Fahrenheit on a daily basis. Such a rise in temperature raises evaporation rates much higher than when temperatures were in the 60s and 70s as they were during the beginning of this dry period in early to mid-May.

Rainfall varied across the main production areas of Europe during the past week. Spain, Portugal, southern and central France, Hungary, Croatia, Bosnia and Herzegovina, Serbia, western sections of Romania and Bulgaria, western Ukraine, and southern Belarus received 0.43 to 3.50 inches of rain with a local amount of 5.08 inches in Serbia for the seven-day period ending this morning. Northwestern France, southern England, and portions of central and southern Germany and southern Poland received 0.12 to 1.61 inches of rain. Other locations in Ukraine received 0.20 to 1.30 inches of moisture. Many areas in Italy received 0.16 to 2.24 inches of rain with local amounts up to 5.12 inches in the north. The remaining locations received little to no precipitation.

Topsoil moisture is rated short to very short from portions of northern France through much of Germany to northern Poland, the Baltic States and portions of Belarus. Some areas to the north into Scandinavia have also reported limited rainfall and low soil moisture. Eastern parts of Romania, Moldova, eastern Bulgaria and a few other areas in eastern Spain and central Italy are also dealing with low topsoil moisture. However, out of all the areas noted to be dry the only areas with limited subsoil moisture are in Romania, eastern Bulgaria and parts of Moldova as well as eastern Spain – these are the areas most stressed by dryness. Most other areas have marginally adequate to slightly short subsoil and that may be carrying crops through this period of dryness relatively well. Rain must start falling soon, though, because subsoil moisture is not going to stay at favorable levels much longer, especially with temperatures predicted to be warmer than usual in the next ten days. Crop moisture stress is notable in most of the areas noted above to be dry and relief is needed soon to protect production potentials.

All other areas in Europe received enough rain recently to either improve crop growth or maintain a good environment for aggressive development. The ground is favorably wet in Portugal, northern Spain, southern France and areas east into Czech Re-

North Europe Drying To Last Another Week (from page 9)

public, Slovakia, Hungary and the western Balkan Countries.

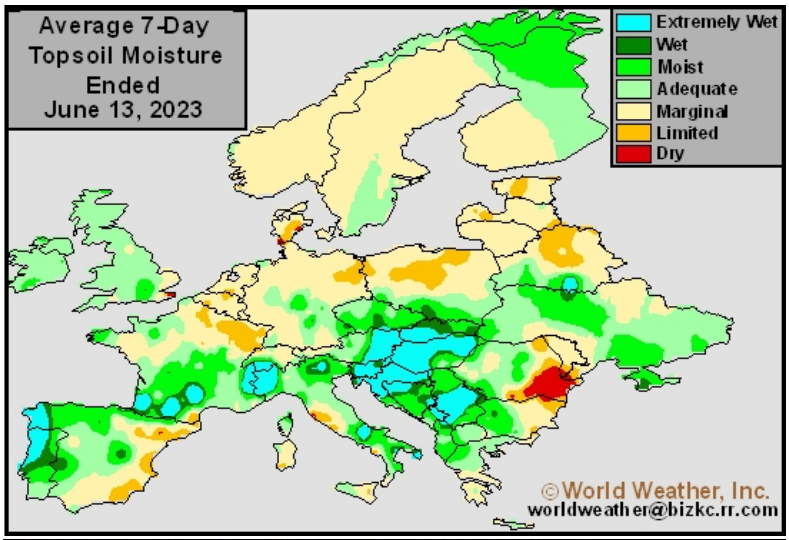
WEATHER OUTLOOK

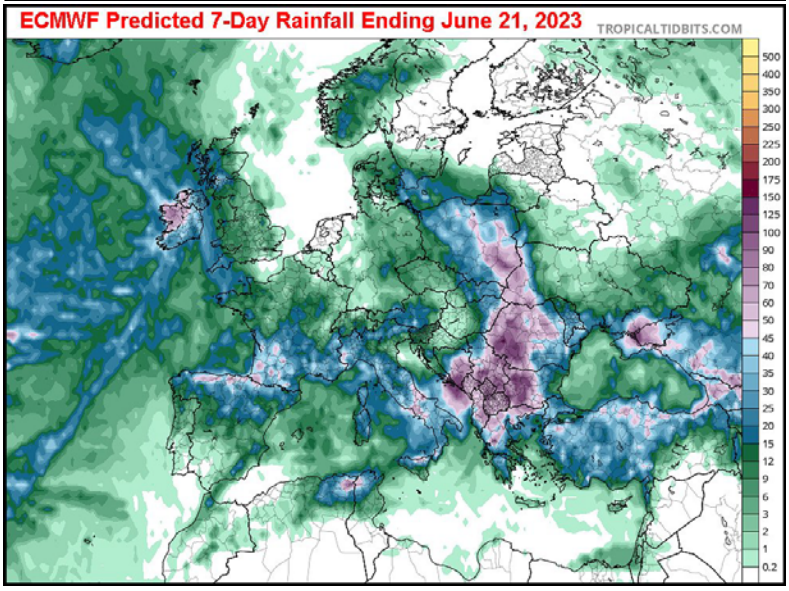
Precipitation will again vary across Europe during the coming week. Germany, Belgium, the Netherlands, and portions of western Poland will trend drier biased during the coming week. A low-pressure trough will meander around these locations through the end of the weekend. Light rain will be scattered across these locations at times, though no significant rain is expected. A frontal boundary could then promote light rain early next week. Moisture totals by next Tuesday morning will range from 0.10 to 0.75 inch with drier pockets.

Temperatures over the coming week will be mild with daytime highs reaching the 60s and 70s Fahrenheit with pockets in the 50s.

The drying trend will persist across these areas despite the periods of light rain. The environment will remain poor for crop development in the driest areas and only fair in other areas across the north. There is still time for better rainfall to improve crop conditions and production potentials, though the need of timely rain will be high during the balance of this month. Rain potentials will increase slightly for these locations June 21 – 27, which could be some of the most important rainfall these areas see this month.

Eastern sections of Belarus and Ukraine, along with Portugal and much of Spain outside the northeast and north-central production areas, will also be drier biased during the coming week. Portugal and Spain will either have some moisture to support new growth or will rely on irrigation. Eastern sections of Belarus and Ukraine will either become or remain too dry to support ideal crop growth. The need for rain will further increase later this month, though periods of rain will be possible June 21 – 27.





The remaining locations in Europe will see a good mix of rain and sunshine during the coming week. The trough over central Europe will promote periods of erratic rain through the end of the weekend. Another trough will bring rain to portions of Western Europe late this weekend and early next week as well. Moisture totals by next Tuesday morning will range from 0.50 to 3.00 inches with local amounts of 4.00 inches or more in the Balkans region, western Ukraine, and eastern Poland. Drier pockets are also expected in Hungary. The environment will either improve or remain favorable for aggressive crop development. Most locations outside northern Spain will again have opportunities for rain June 21 – 27 as well.

Overall the bottom line in Europe is that it has been and will continue to be too dry for another week in the north. Southern areas have been wet and these biases will prevail for a while. The impact on 2023 production should be low as long as rain resumes soon.