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The Canadian Agriculture Weather Prognosticator

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World Weather At A Glance

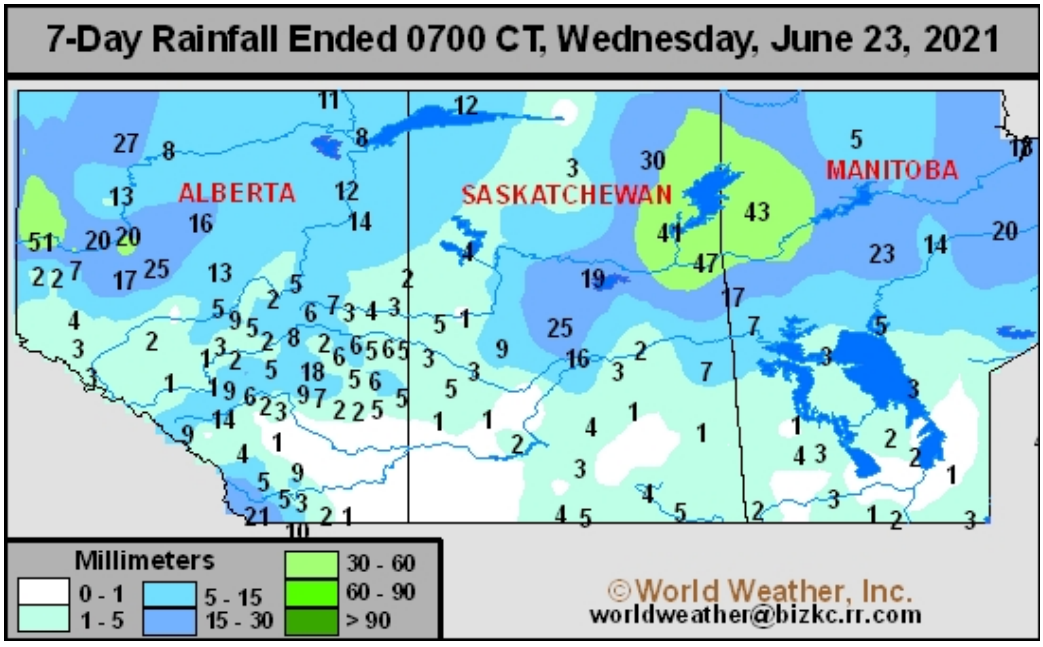
- A portion of Russia's spring wheat and sunseed crop is suffering from dryness
- Western Russia and most of Europe have seen and will continue to see well-timed precipitation supporting most crops well
- China's weather in key grain and oilseed production areas has been well mixed so far this year and production potentials are high
- India's monsoon has been struggling in the west and north, but for June below average precipitation is not serious. Rain has to improve in July though
- Australia wheat, barley and canola planting and establishment is advancing well
- Argentina wheat is establishing relatively well, but a boost in rain would be welcome
- Southern Brazil wheat is in good shape
- Ontario and southern Quebec rain to increase

Hotter Days Coming To Exacerbate Stress

Crop and livestock stress is steadily worsening across southern and eastern portions of Canada's Prairies and the northern U.S. Plains. A new ridge of high pressure that promises to set records for heat in the U.S. Pacific Northwest and far western Canada this weekend through the middle part of next week promises to reduce some of the favorable soil moisture that is present in western and northern Alberta and allow some of the dryness in other parts of the Prairies to expand. Some of the excessive heat will shift briefly into the northern Plains and Canada's Prairies for a while next week and that will take most of the drier biased areas in those regions to a new level of extremes possibly turning mediocre crop development into a more heightened level of distress.

Rain has scattered across portions of the Prairies and northern U.S. Plains over this past week, but resulting rainfall was rarely enough to induce a lasting change in soil moisture. A very large part of the region has experienced some short term cooler temperatures which have helped to reduce evaporation rates, but without greater rainfall it has been virtually impossible to change the long term outlook which remains potentially very stressful.

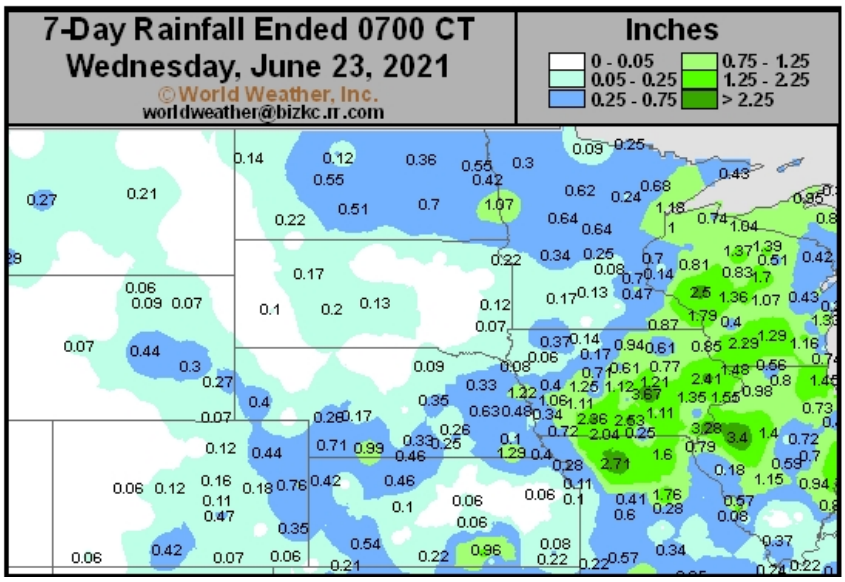
Rainfall over the seven day period ending Wednesday was less than half of normal in a large section of the northern Plains; however, there were a few locations in North Dakota, northwestern Minnesota, and western Montana that received near to slightly above normal rainfall. In the Prairies, there were several areas in northwestern Alberta and a few in central Alberta and north-central



Hotter Days Coming To Exacerbate Stress (continued from page 1)

Saskatchewan that received 0.30 to 1.25 inches of rain and locally more. Rainfall was limited in other areas.

Soil moisture remains short to critically short from much of Montana, the western two-thirds of North Dakota, eastern South Dakota, and southwestern Minnesota into southern Alberta, southwestern and central Saskatchewan and neighboring areas. Western, central, and northern Alberta have adequate soil moisture due to the recent rain, but that may soon change with the coming week of hot and drier weather. Other production areas in the Prairies and northern Plains have marginally adequate to short soil moisture.



Crop development conditions have remained fair to very poor in the driest areas noted above. These areas received some timely rainfall earlier in the growing season that supported some crop growth and development with a few areas experiencing nearly ideal early season growth. However, warm temperatures and strong wind speeds along with low relative humidity have worked against conserving soil moisture and a steady decline from the favorable conditions of May has occurred. A cut in production potential has already resulted in some of the more severely impacted areas, but there is a growing concern over the long term prospects for corn, soybeans, canola, lentils, flax, sugarbeets, wheat, barley and oats as well as other crops produced in the region. Crop conditions have remained more favorable in those areas with the slightly better soil moisture, but routine rainfall has to occur over the next few weeks to protect those crops and to stop the decline in crop conditions in the driest areas noted above.

A disorganized disturbance and weak frontal boundary will slowly advance over the Prairies through Friday generating some scattered showers and thunderstorms. Some of the precipitation will linger in the U.S. northern Plains during the weekend, but the distribution of rain will be disappointing to say the least. Southernmost Alberta, much of Montana and a huge portion of both Manitoba and northern Alberta will get less than 0.25 inch (6mm) of moisture. Interior southern Alberta, interior southwestern through southeastern Saskatchewan, far southwestern Manitoba and portions of both North and South Dakota will receive 0.25 to 0.80 inch (6-20mm) of moisture. Locally strong thunderstorms in a part of central North Dakota and portions of South Dakota and southern Minnesota will generate 0.50 to 1.50 inches of rain with a few counties to get more than 2.00 inches. The majority of the greatest rainfall will not be widespread enough for a general improvement in soil moisture, but several areas will experience a short term reprieve from the driest conditions.

STRONG HIGH PRESSURE RIDGE EXPECTED

A ridge of high-pressure building over far western North America during the next few days will remain over the region through Tuesday. Rainfall will be restricted from British Columbia and the U.S. Pacific Northwest through the western most Prairies while a few isolated showers move into the eastern Prairies, Minnesota, and the eastern Dakotas. The resulting precipitation will be too light to counter evaporation.

Not only will there be net drying across most of the Prairies and the northwestern U.S. Plains, but hotter temperatures will accelerate the drying trend. Daytime highs will peak in the 80s and 90s Fahrenheit (30s Celsius) with portions of Alberta, Saskatchewan, Montana, and neighboring areas warming near and above 100 Fahrenheit (38C) during the early and middle parts of next week. The high pressure ridge will begin shifting to the east while beginning to break down during the middle part of next week allowing some of the excessive heat to get a little deeper into the northern Plains and Prairies.

Expanding heat and moisture stress across the Prairies this weekend through mid-week next week is likely to exacerbate the stressful environment that the driest crop areas are already enduring. There will also be an expansion of the driest areas to the west and north into Alberta and northwestern Saskatchewan.

As the ridge of high pressure breaks down late next week, there will be a notable cold front cutting through the Prairies and a weather disturbance that moves inland from the eastern Gulf of Alaska into

(continued on page 5)

Summer Outlook Changes Little

July and August weather has not changed greatly from that of the previous prognosticator. However, with no significant cooling of ocean water off the U.S. Pacific Coast there will not be much incentive for the summer ridge of high pressure to advance to the east as much as was once suggested. For that reason, rain potentials in the western Prairies have been slightly reduced and the area of below average precipitation in the eastern Prairies has expanded somewhat.

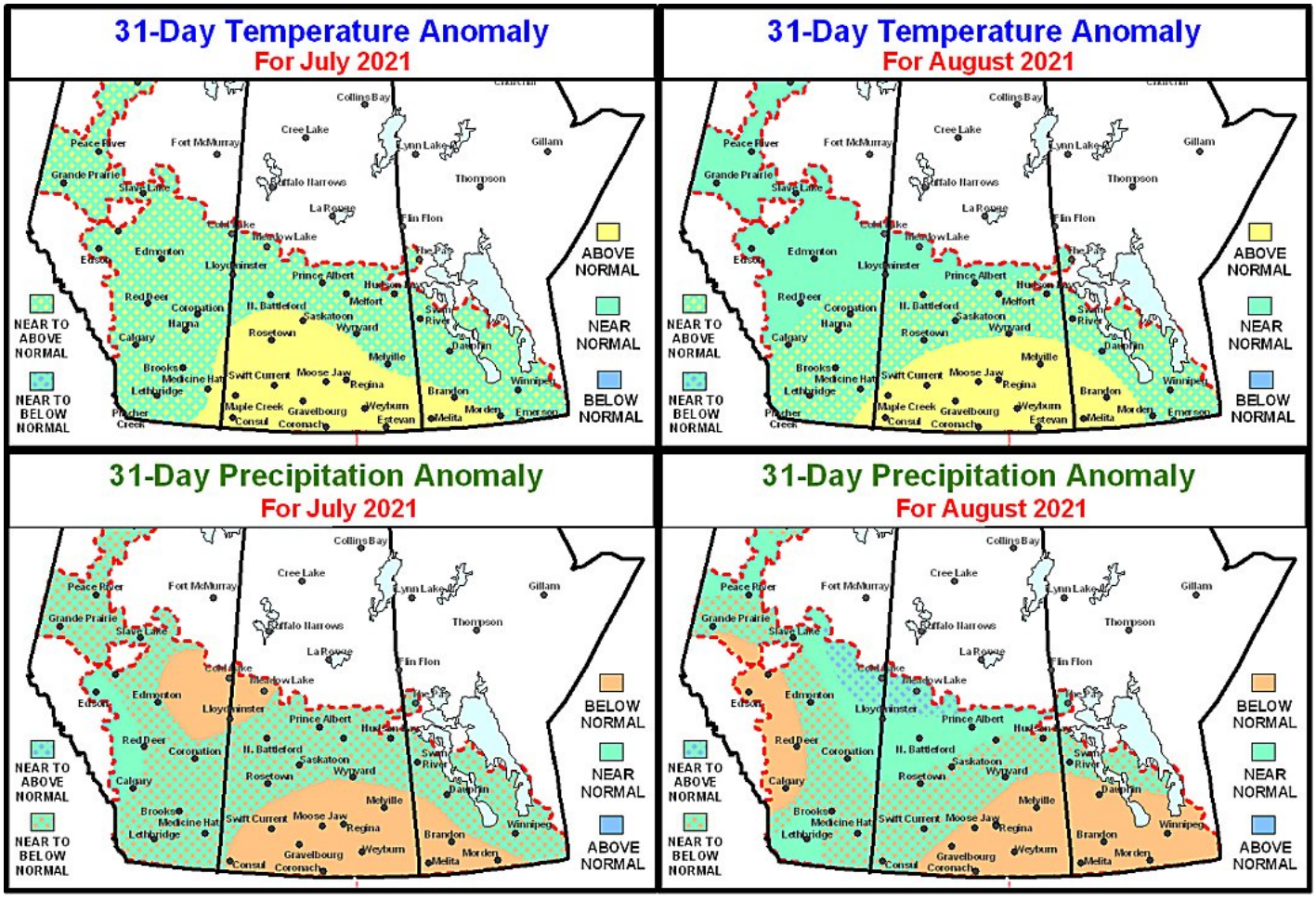
It is very important to note that below average precipitation does not mean no rain. The unfortunate part of the forecast is the warm temperature outlook. With temperatures trending above normal in the southern Prairies it will be more difficult for the rain advertised during July and August to slow down drying rates. The heat will keep evaporative moisture losses high which will remove moisture from light rain events relatively quickly after each occurrence.

Similar to June, temperatures will swing from mild to hot and back again periodically through the summer. The warmer than usual days will be more dominating, but at least there will be a few breaks from the hottest days periodically. The periodic swing in temperatures from very warm to mild and back again will raise the potential for rainfall, but moisture is not going to be very abundant in the region. The first half of July will be equally dry to that of June and with temperatures running warmer than usual it will be very difficult to get any area to receive enough rain to bolster soil moisture in a lasting manner.

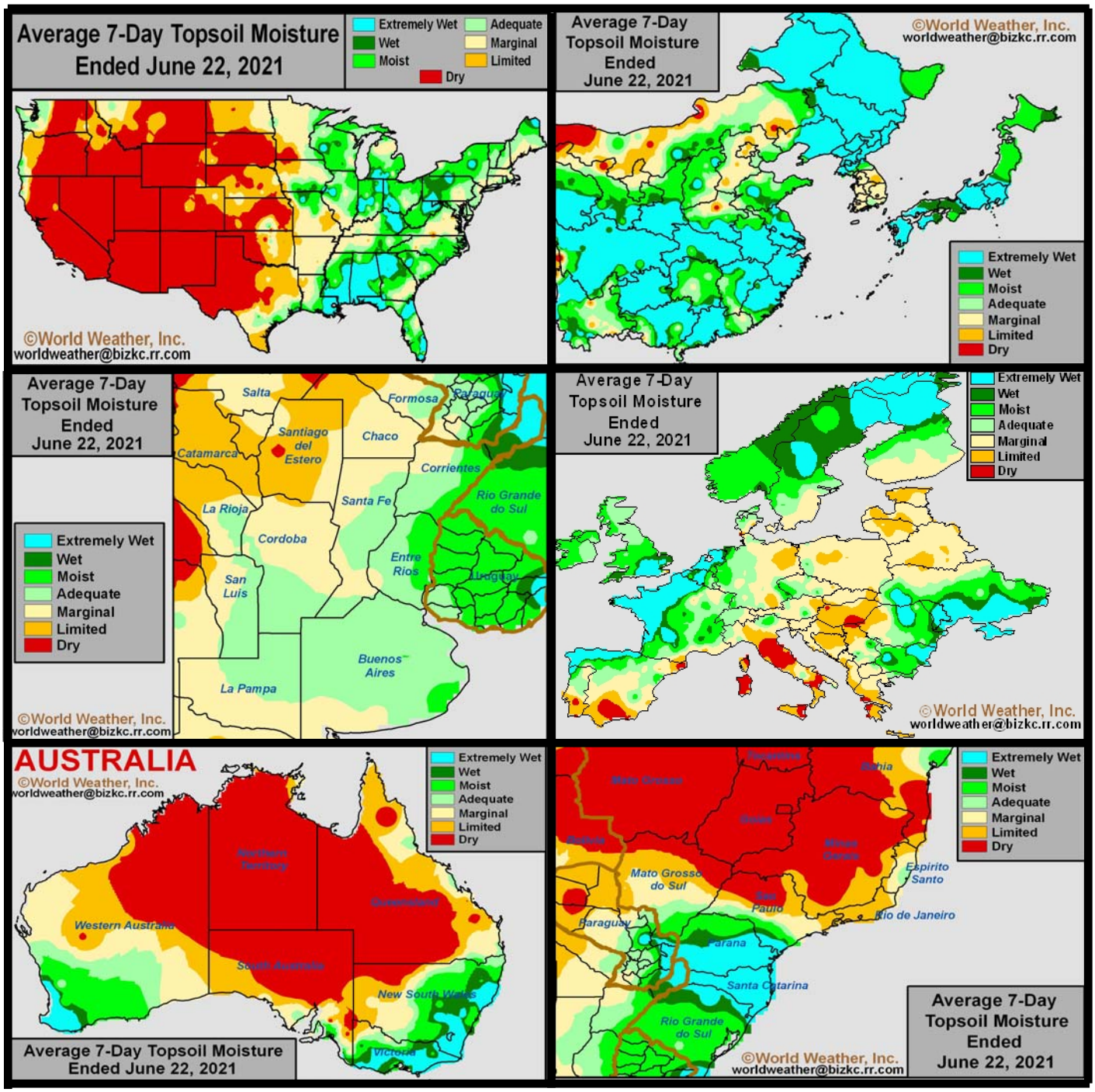
In late July and especially August two things will change. First the mean ridge position will shift slightly to the east raising the potential for a little Pacific air to stream into the southwestern Prairies periodically. The second change will be an opportunity for monsoon moisture to shift far enough to the north to bring moisture into Montana once in a while. The combined impact of monsoon moisture and Pacific moisture flowing into the southwestern Prairies will raise the potential for a little more rain.

The precipitation will be kept low in this forecast until it becomes obvious or not that the moisture will or will not be present in the latter part of summer, but that is the only time period in which the potential for some improved rainfall is possible.

Temperatures may trend a little cooler in Alberta during August when the ridge shifts slightly to the east.



Selected Weather Images From Around The World



U.S. soil moisture is rated favorably in the Midwest, Delta and southeastern states. Rain expected over the next week will be heavy in the lower and eastern Midwest resulting in a greater level of moisture abundance. Flooding is expected in parts of Missouri, Illinois and Indiana. In contrast, northwestern Corn Belt areas and the northern U.S. Plains will remain drier than usual. Europe soil conditions firmed up over the past week, but a new bout of rain entering the west will soon overspread most of the continent restoring favorable soil moisture to all areas except the far south. Australia weather has begun to improve with timely rain reaching wheat, barley and canola areas and the early outlook for spring is looking better every day. Southern Brazil wheat areas are plenty moist and some welcome drying is coming over the next couple of weeks. Argentina's winter wheat planting environment has been almost ideal this year. China has seen a favorable mix of weather recently and more of the same was expected into July.

Hotter Days Coming To Exacerbate Stress (continued from page 2)

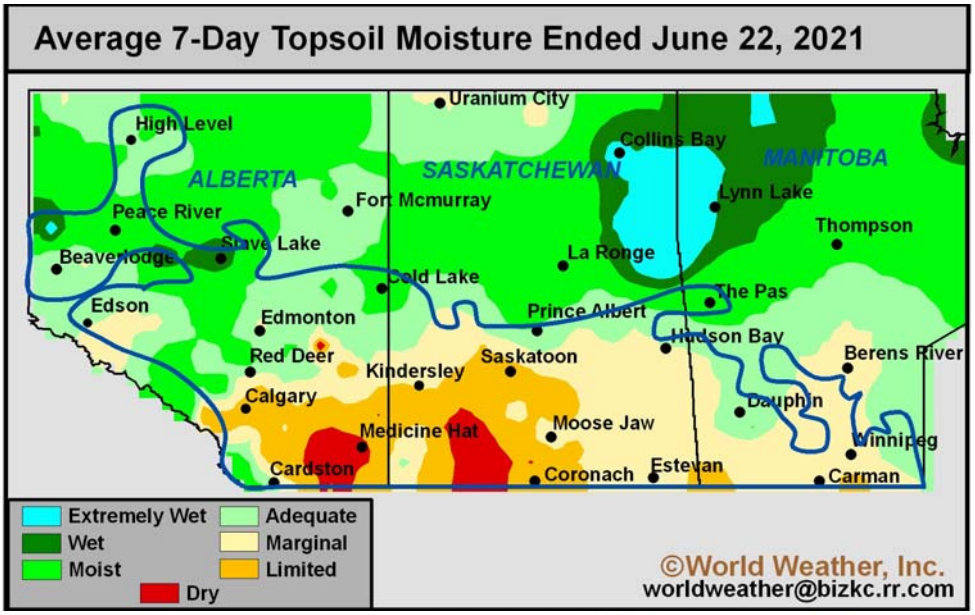
northern British Colombia and the Peace River region. These areas will have a good chance for rain, but other areas in Alberta will not likely have enough moisture in the atmosphere to stir more than sporadic showers and thunderstorms. The storm system will likely lose its significance after crossing the Rocky Mountains and a couple of days will be needed before the system can regain some of its organization. By then, the storm will be exiting the Prairies and northwestern U.S. Plains leaving those areas dry. Showers that impact the eastern Prairies and northeastern U.S. Plains as well as the upper Midwest will be beneficial, but light. Much greater rain will be needed to set a serious improving crop trend and that does not look very likely at this point in time.

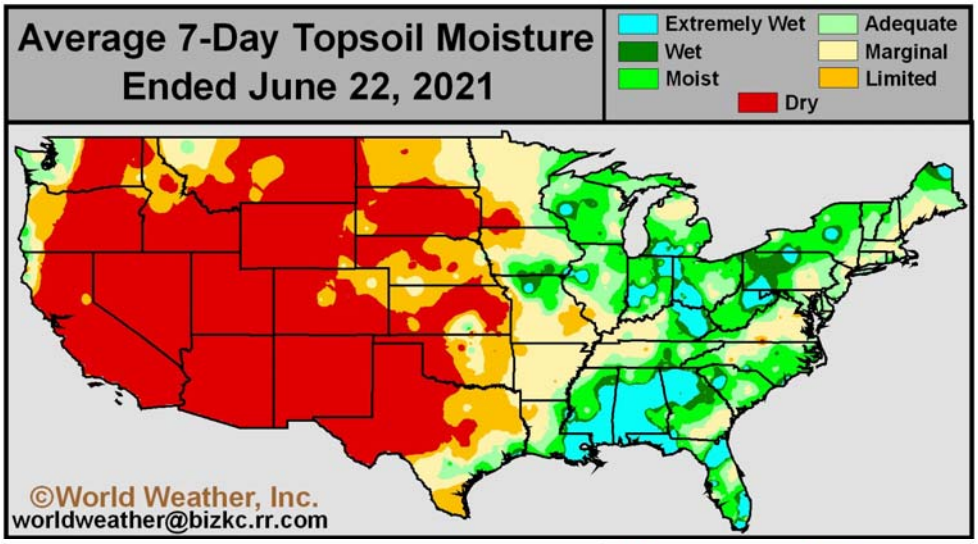
A new ridge of high pressure will evolve in the second week of July that will linger for a while causing another period of drier and warmer biased weather to evolve. The earliest that this cycle of heat and dryness can change will be in the second half of July and it may not occur until seasonal changes arrive in September.

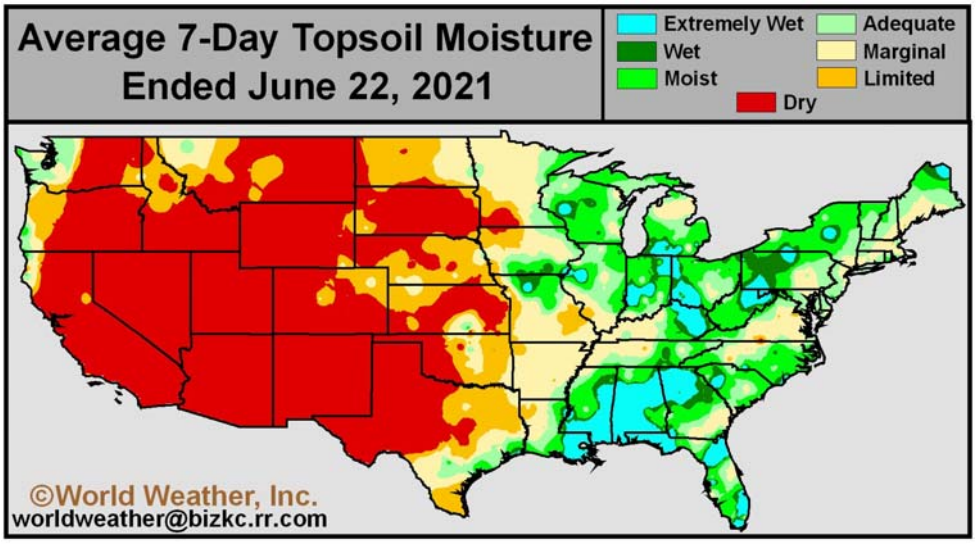
AUTUMN FROST?????

Concern about early season frost and freezes has risen after the recent frost event of June 21. Getting moisture into the Prairies is very important over the next few weeks. If there is not much precipitation, the air will remain very dry and the first time a significant shot of cooling pushes into the region there will be some potential for the cold to get intensified.

Our Trend Model does suggest a tendency for cool shots of air to come go at 45-day intervals, but the timing does not work well and more study time is needed. A ridge of high pressure in August should reduce the risk of cold for that month.

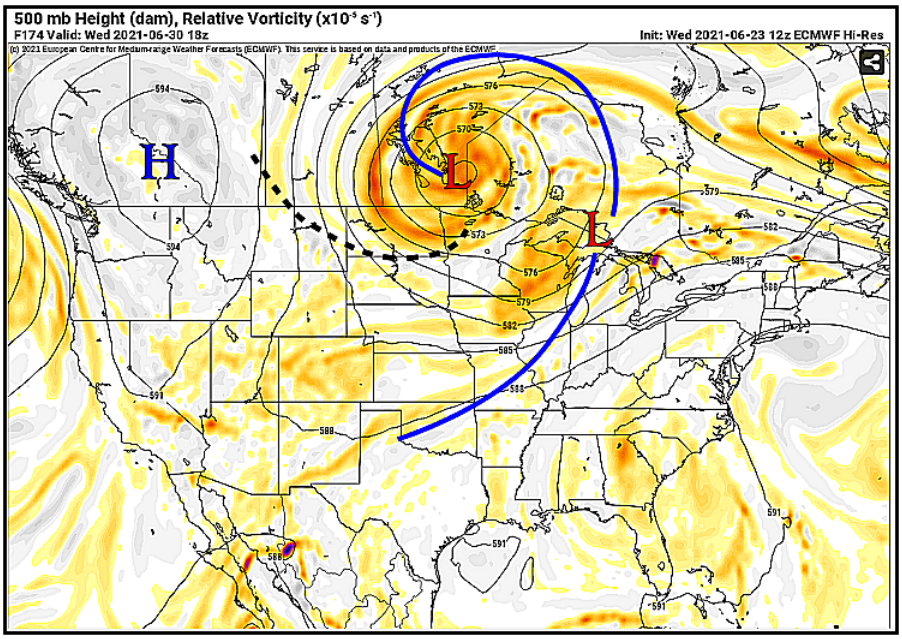






Record Heat Expected Far Western Canada, U.S. NW

An impressive ridge of high pressure expected to build over the western part of North America this weekend and next week promises to produce temperatures well over 100 degrees Fahrenheit (38C) far to the north into British Columbia and western Alberta, Canada. Temperature extremes in the Yakima Valley of Washington State could rise above 110 degrees Fahrenheit (43C) for the first time since 2015. The heat will culminate a prolonged period of drought that has impacted western North America and will lead to serious crop and livestock stress from far western parts of Canada into the northern U.S. Great Basin. The heat will attempt to spread east across Canada's Prairies and the northwestern U.S. Plains late next week, but will likely be cut off by a new surge of cool air coming from northern Canada.



The same ridge of high pressure that brought record and near-record heat to the western United States and across a part of the U.S. Plains over the past ten days will be relocated far to the west in North America this weekend. The ridge will then be allowed to intensify and instead of it impacting the western United States most significantly it is advertised to evolve at higher latitudes resulting in a rarely seen high latitude surge of 100-plus degree Fahrenheit Temperatures.

The hottest weather is expected during the early to middle part of next week and some of the computer forecast models have suggested temperatures over 100 Fahrenheit will reach as far north as the Peace River region in far northwestern Alberta and far to the north in British Columbia as well. The European weather computer forecast model has suggested extreme temperatures over 110 (43C) will be possible in the Yakima Valley of central Washington early to mid-week next week. The last time temperatures were that hot in the valley were in 2015. For much of the Yakima Valley extreme temperatures like that have only occurred in 2015 and 1961 – which, by the way, was also a bad drought year in Canada's Prairies and some neighboring areas.

Temperatures deeply in the 90s Fahrenheit (32-37C) will occur in the remaining crop region of Alberta and possibly as far east as Saskatchewan later next week. Temperatures extremes in the Prairies have already reached up above 100 degrees (38C) this summer a couple of times and that implies that some of the heat next week in Alberta and western Saskatchewan could easily breach that level once again.

The ridge of high pressure responsible for the excessive heat should break down during the second half of next week. Widespread significant rain is needed to accompany the cool off to help crops and livestock areas recover from the brutal conditions. Unfortunately, the severity of drought conditions in the region will make it very difficult for meaningful moisture to reach into the area. British Columbia and the Peace River region of Alberta will have the best chance for rain as a storm system comes inland from over the Pacific Ocean carrying some moisture with it. The storm system should go up and over the top of the high pressure ridge and as it moves across the northern Rocky Mountains of western Canada it will lose much of its moisture. That implies a restricted rain event will accompany the cooling trend in western and central parts of Canada's Prairies during the latter part of next week.

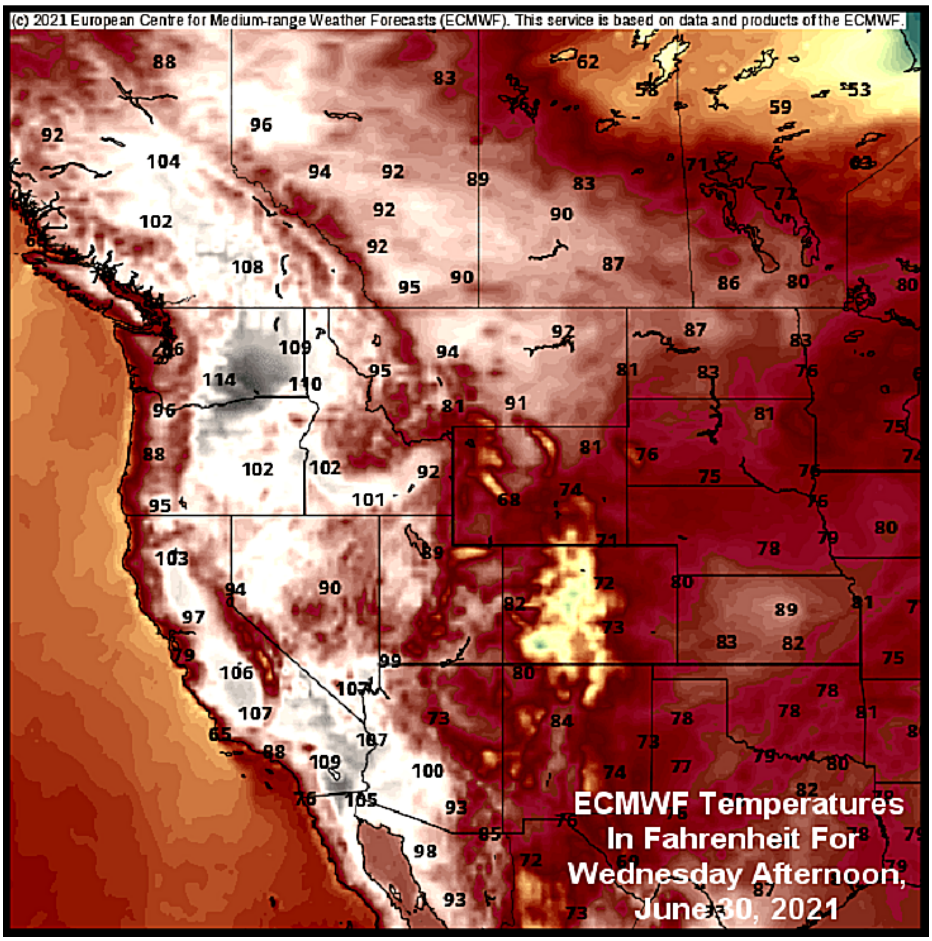
Restricting rainfall when the cooling trend begins will raise more concern about crop weather in July when the next time high pressure is expected to build up over western North America. That returning ridge of high pressure is due to return in the second week in July and may take up a position farther to the east over the U.S. Rocky Mountains and western high Plains. That new July ridge of high pressure is expected to stay west of the U.S. Midwest, but it will be closer to the western Corn Belt to bring on warmer temperatures and to further suppress rainfall. Until then, there will be potential for periodic rain in much of the U.S. Midwest, southern Plains and southeastern states while the upper Midwest and northern Plains along with the Prairies will only receive a restricted amount of rain.

Record Heat Expected Far Western Canada (continued from Page 6)

The bottom line remains the same as it has been all spring that summer weather is going to be a real challenge for much of the Prairies, northern U.S. Plains and upper Midwest because of dryness and bouts of heat.

The hottest weather in British Columbia and western Alberta is expected Tuesday and Wednesday of next week with highs in the middle and upper 30s to 43 degrees Celsius. British Columbia and the U.S. Pacific Northwest will be hottest. Temperatures in the remainder of the Prairies will heat up in the second half of next week with readings well into the 30s to around 40 as well. That kind of heat while rainfall is very limited will stress crops rather seriously. The lack of rain that will precede these hottest temperatures will also add to the potential for accelerated crop stress.

Relief should occur in the first weekend of July, but it is still questionable how significant that relief will be.

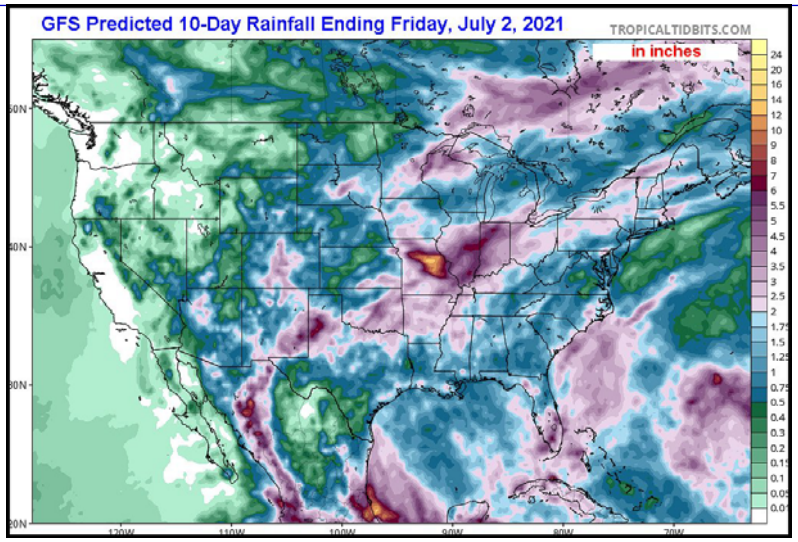


Central U.S. To Get Flooding Rain Next Few Days

Excessive rainfall is expected in the central U.S. Midwest Thursday through Saturday with frequent follow up rain into next week. Some areas in Missouri, Illinois, Indiana and southeastern Iowa will receive multiple inches of rain with a few areas getting more than 10.00 inches.

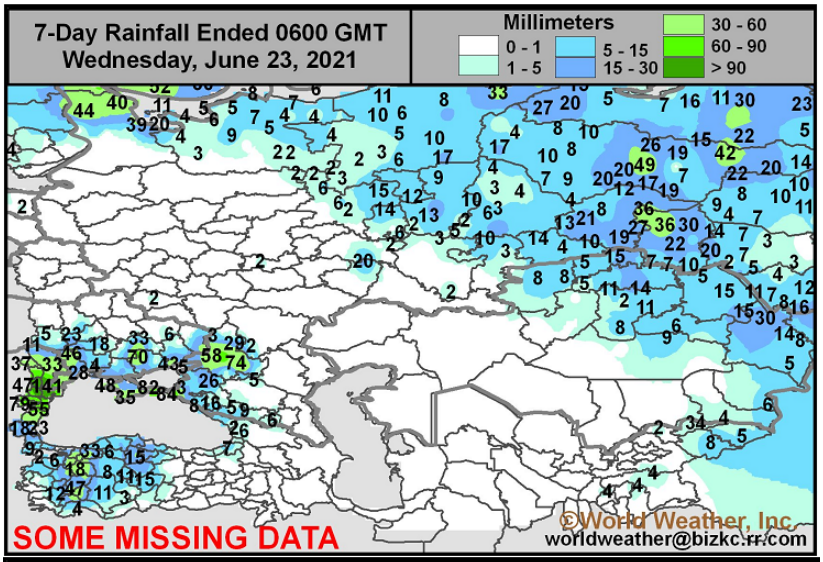
Flooding is expected and some damage to crops in low-lying areas of Missouri and Illinois will be possible. Some of the strong thunderstorms that are advertised will also produce hail, damaging wind and a few tornadoes.

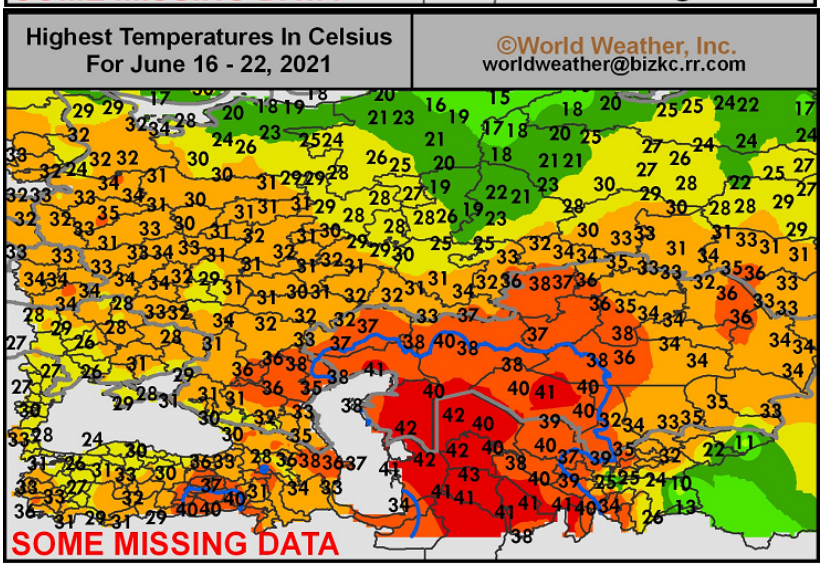
Most other areas in the Midwest will also get rain over the next ten days keeping most corn and soybean production areas favorably moist. Only northwestern crop areas will remain too dry.



Western Russia, Neighboring Areas Will See Rain Return

A large portion of western Russia, Belarus, northern Ukraine, and neighboring areas saw warm and dry weather during the past week. Soil moisture decreased significantly, though there was still enough to support generally favorable grain and oilseed development. These areas will see rain return during the coming week that will help reverse the drying trend and maintain a good environment for many, but not all crops. In the meantime, the eastern New Lands received much-needed rain during the past week and will see more rain through the middle of next week. Many unirrigated fields in northwestern Kazakhstan and neighboring areas of Russia, however, are still a little too dry to support ideal spring wheat and sunseed crop development and rain is needed.





Variable rainfall was noted in the western Commonwealth of Independent States during the past week. Western sections of the USDA defined 'Southern Region' into southern Ukraine received 0.71 to 2.91 inches of rain for the seven-day period ending this morning. The eastern New Lands region received 0.32 to 1.42 inches of rain while many areas in the Ural Mountains region received up to 0.67 inch. The remaining portions of Russia, western Kazakhstan, Ukraine, Belarus and neighboring areas experienced net drying with daily afternoon temperatures peaking in the 80s and 90s Fahrenheit.

Western Kazakhstan and neighboring areas in the Ural Mountains region and 'Southern Region' have short to very short soil moisture due to the lack of and rain and warm weather. The ground firmed in most other locations in the western CIS, though most areas still have adequate to marginally adequate moisture.

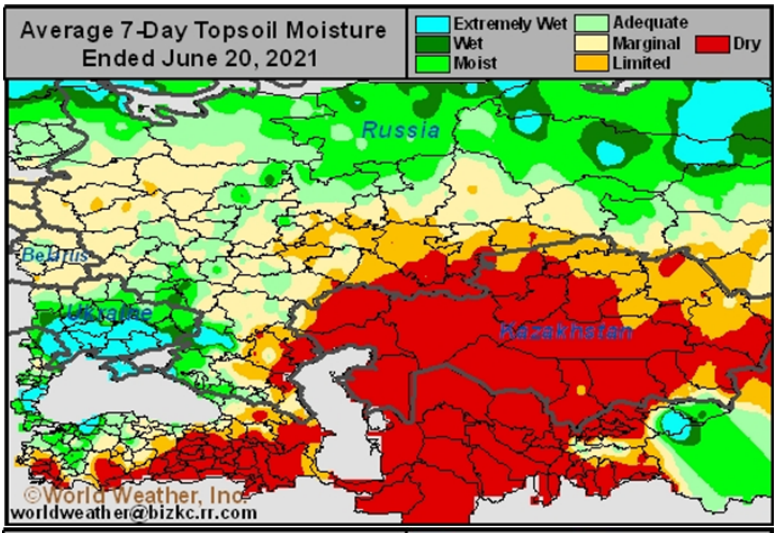
Spring wheat, barley, sunseed, rapeseed, corn, soybeans, and other coarse grain and oilseeds produced at this time of year are still in good shape in western Russia, Ukraine, Belarus, and neighboring areas despite the recent drying trend this past week. There was ample soil moisture before the drier and warmer biased pattern evolved and that helped maintain aggressive crop growth, despite the drying trend. Eastern sections of Russia's 'Southern Region', portions of the Volga River Basin, and the Ural Mountains region are a little too dry for aggressive plant development and a good soaking of rain will be needed in the near future. In contrast, recent rainfall in the eastern New Lands eased long term dryness and helped improve crop development. The region is still struggling with some moisture deficits and additional rain is needed.

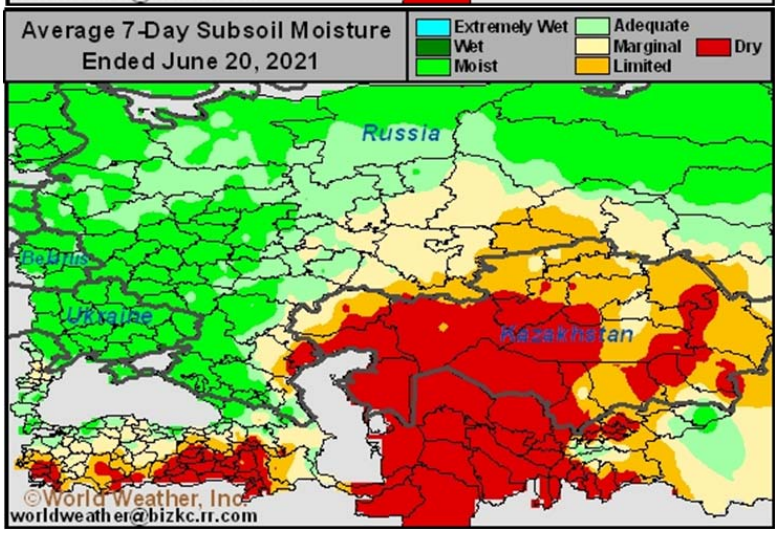
Winter wheat, barley, and rye prospects remain favorable in much of the western CIS. Rainfall in May and earlier this month supported a good environment for late-season development. Yields are expected to be high, although the cool and wet start to spring might have had a

Western Russia Will See Rain Return (continued from Page 8)

little negative impact. The next few weeks will still be quite important to winter crops since many are reproducing and filling. It will be imperative that all of the production area gets sufficient rainfall to restore soil moisture so that reproduction and filling can conclude favorably.

Western Russia, Ukraine, Belarus, and the Baltic States into the Volga River Basin, Ural Mountains region, and the 'Southern Region' will see a good mix of erratic rain and sunshine through the middle of next week. Scattered showers will evolve overnight into this weekend as a disorganized low-pressure center slowly advances over the western CIS. Another disturbance will promote erratic rainfall later this weekend into the first part of next week as well. North-central Ukraine and portions of west-central Russia will receive 1.00 to 4.00 inches of rain and locally greater amounts by next Wednesday. Most other locations will receive 0.35 to 2.00 inches of rain with locally greater amounts in other portions of western Russia. Pockets in the 'Southern Region', lower Volga River Basin and neighboring areas will also receive less than 0.25 inch of rain.





Soil moisture will either remain near current levels or increase for the majority of winter crop areas noted above. There will be need for greater rainfall in a few locations in Russia's 'Southern Region', the lower Volga River Basin, and Ural Mountains region where some dryness is expected to prevail. Early maturing winter crops would benefit from some drier weather again in the second half of July to expedite crop maturation and set the stage for a good early start to harvesting.

The eastern New Lands will continue to see a good mix of rain and sunshine through the middle of next week, although most of the significant rain will occur through Saturday. After Saturday the precipitation will become more sporadic and light allowing a new drying trend to resume. Moisture totals will vary from 0.20 to 0.60 inch with a few amounts closer to 1.00 inch.

Western and north-central Kazakhstan will remain drier biased through the middle of next week. Isolated showers will occasionally reach the region, though resulting rainfall will be lost to evaporation. Spring wheat and sunseed will likely slip back into a more stressful environment because temperatures will likely heat up above average in the region during this same period of time.

BOTTOM LINE

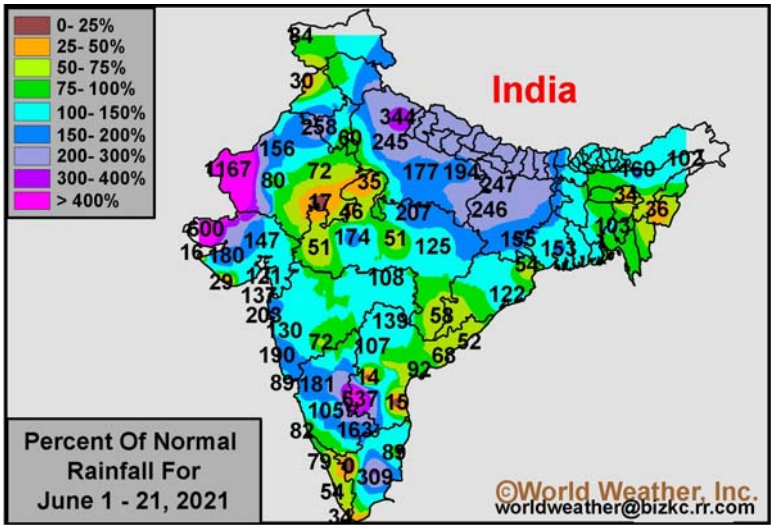
Overall, the bottom line for wheat and sunseed production in Russia and Kazakhstan is varied. Winter crops in Russia are mostly in good shape and have not been seriously altered by the recent hot and dry weather, but relief is definitely needed. Spring wheat and sunseed are stressed in unirrigated areas of northwestern Kazakhstan with most of the area impacted by dryness dedicated to wheat. Much of the sunseed crop is a little farther to the east where crop moisture stress has been less serious – so far – and sunseed is a little more resistive to dryness than wheat.

Northern, Interior West And South India Missing Rain

Gujarat and several areas in Rajasthan received some much needed rain during the past week that helped to improve soil moisture for early season planting. Dryness is still prevalent in Rajasthan and other northern India locations where abundant rain is still needed to support summer crop planting.

Eastern and portions of central and northern India also received varying amounts of rain during the past week continuing an improving soil moisture trend that began earlier this month supporting planting and emergence of early season crops and the development of sugarcane and rice.

Monsoonal rainfall will generally be restricted to portions of central and eastern India this week. The region will remain excessively wet and vulnerable to flooding. Other production areas in India will have a few opportunities for spotty rainfall, though net drying is expected in the north, interior west and interior south.



Rain fell most significantly in two areas during the past week. The first occurred in the lower half of the Ganges River Basin where rain totals of 2.32 to more than 7.00 inches resulted. Local totals of 8.00 to 11.18 inches occurred in portions of Bihar, Bangladesh and near the mountains in Uttar Pradesh. A second area of significant rain and flooding occurred along the west coast where 4.00 to 17.95 inches resulted. Almost all of the heavy rain along the west coast did not reach very far inland leaving the interior western and far southern parts of India with much more limited rainfall.

Some areas in Andhra Pradesh, Tamil Nadu and Telangana were left completely dry while areas to the north from eastern Karnataka and northwestern Telangana to central Maharashtra received 0.10 to 0.50 inch with a few greater amounts.

Another area of dryness occurred in Haryana and Punjab where rainfall varied from nothing to 0.96 inch whereas Gujarat received the week's most important rain with amounts of 2.50 to 6.89 inches. Gujarat's rain was ideal in bolstering soil moisture for some early season groundnut, cotton, soybean and other crop planting. Rain in Rajasthan was more erratic for planting and only a few areas received enough moisture to support the process. Amounts in Rajasthan ranged from 0.35 to 1.34 inches except in the far southeast where up to 1.73 inches resulted.

Portions of eastern Rajasthan, western and central Madhya Pradesh, northeastern Andhra Pradesh, and southern sections of Chhattisgarh and Odisha have been drier than normal since the beginning of the month with 17-68% of normal rainfall noted. Many areas in the Eastern States, Punjab, Kerala, and neighboring areas have also been drier than usual. Most other areas in India have been wetter than normal since the beginning of June with several areas in Tamil Nadu, southwestern Andhra Pradesh, Karnataka, Gujarat, Uttar Pradesh, Jharkhand, Bihar and northeastern Andhra Pradesh reporting 163-344% of normal rainfall.

Recent rainfall lifted or kept soil moisture at adequate to excessively wet levels in much of eastern and central India. The same is true along the west coast and across Gujarat while most other area were running short to very short of soil moisture. The only exception was in central Madhya Pradesh and eastern Maharashtra along with northern Telangana where soil conditions were rated marginally adequate to slightly short.

The wettest areas in India would benefit from a short term bout of drying to improve field access. Planting will remain sluggish until the weather breaks for a little while. A few days of sunshine and warm weather is all that is needed to improve crop and field conditions.

Recent rainfall in central and western India has also helped support good or improving conditions for coarse grain oilseed, rice, and other crop planting and establishment. Some of the most significant improvements occurred in Gujarat while Rajasthan, Punjab and Haryana are still waiting on the start of more significant seasonal rainfall to support planting.

After a good start to the monsoon season and timely pre-monsoonal rain, southern India has continued to dry down. Crop prospects are still favorable for the region, though a good soaking of rain would be welcome. Much of Punjab and Haryana are also in need of significant rain to support ideal crop conditions. Cotton in northern India is otherwise developing under generally favorable conditions despite the lack of rain during the past week.