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The Canadian Agriculture Weather Prognosticator

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Ontario And Quebec

A very good mix of rain and sunshine continues to impact southeastern Canada's corn, soybean and wheat production areas. This year's production outlook is very good and the coming two weeks of weather will remain good.

WORLD WEATHER ISSUES

- Northern China Has Received Needed Rain Recently Leaving Much Of The Nation's Crops In Good Shape
- Drought From Eastern Ukraine To Kazakhstan Threatens Some Crops, But Most Of Russia Is Doing Well
- Western Europe Has Dried Out And Needs Timely Rain
- Eastern Australia Is Getting Relief From Persistent Dryness; More Rain Needed
- Harvest Weather In South America Remains Good
- Argentina Wheat Prospects Looking Good
- U.S. Midwest Abundantly Wet—Unusual For Late June
- India Monsoon Improves

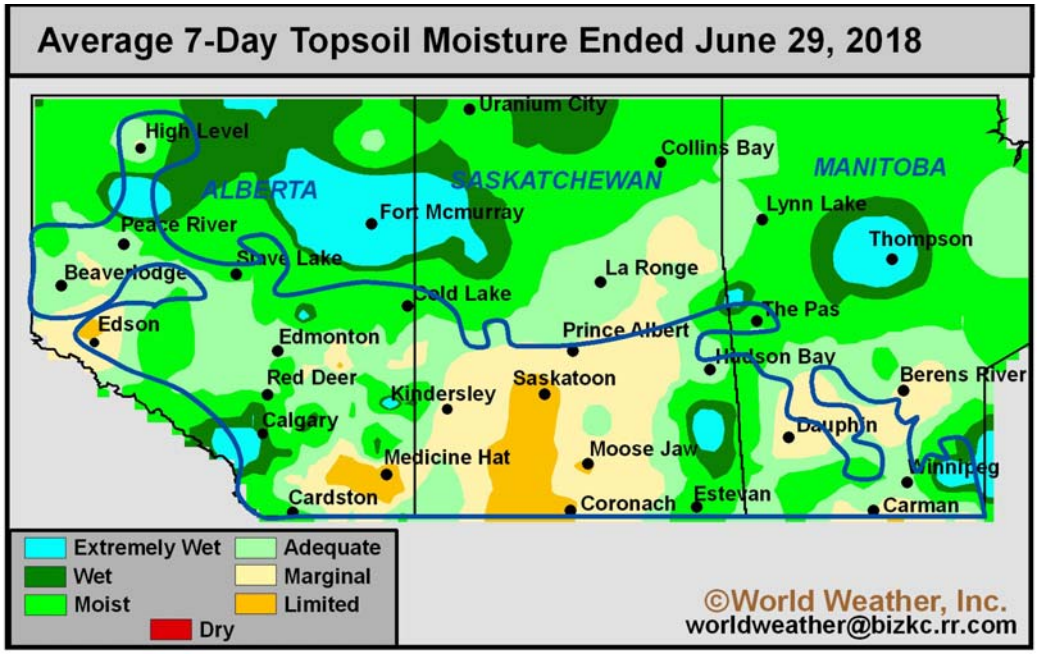
High Pressure Ridge Controls Crop Fate

Soil conditions in the Prairies at the end of June were varying greatly over small regions reflecting the highly irregular distribution of rainfall so far this growing season. Some areas in eastern Saskatchewan, Manitoba and Alberta received moisture abundantly during the month while just as many, if not more, areas reported less than desired and less than needed rainfall.

Warm temperatures were not helping much in those areas that were skimped on rainfall. The most frequent hot weather occurred early in the month and the scattered bouts of rainfall that occurred during the month helped to hold down temperatures a little better later in the month.

However, soil conditions were still too dry in many areas. No area has been drier than that which extends southward from the Saskatoon area to Eastend, Val Marie and the Rockglen/Coronach areas. Some of the official rain totals for the month in this corridor were just 13 to 18 millimeters. Many of these drier areas were already suffering from notable moisture deficits and when the heat was added to the situation crops suffered greatly. There are a few other areas running critically low on moisture, one of which was in the interior southeast of Alberta where conditions were not nearly as dry as those in Saskatchewan, but not a great deal better.

In contrast to the moisture shortages, southeastern through east-central portions of Saskatchewan and extending a short distance into interior western Manitoba received substantial amounts of rain. Some official totals of 100 to 150 millimeters were noted, but there were some unofficial totals of



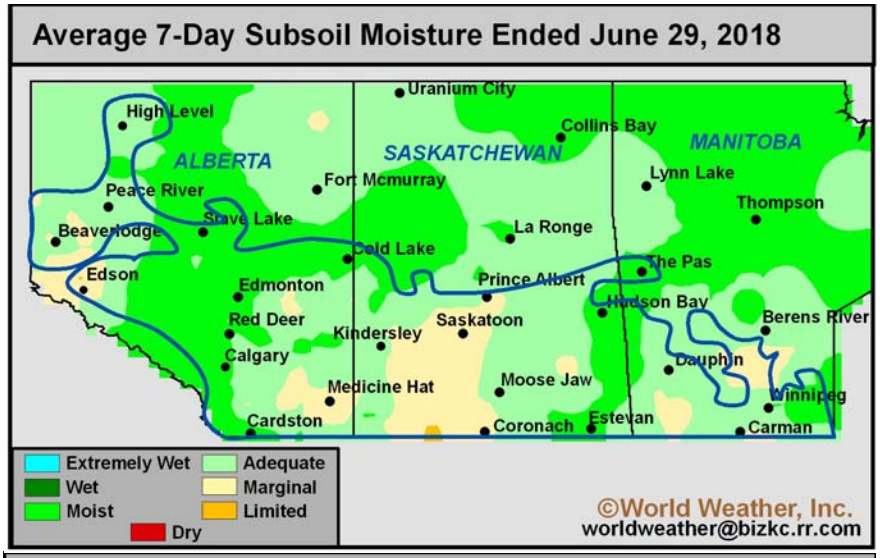
High Pressure Ridge Controls Crop Fate (from page 1)

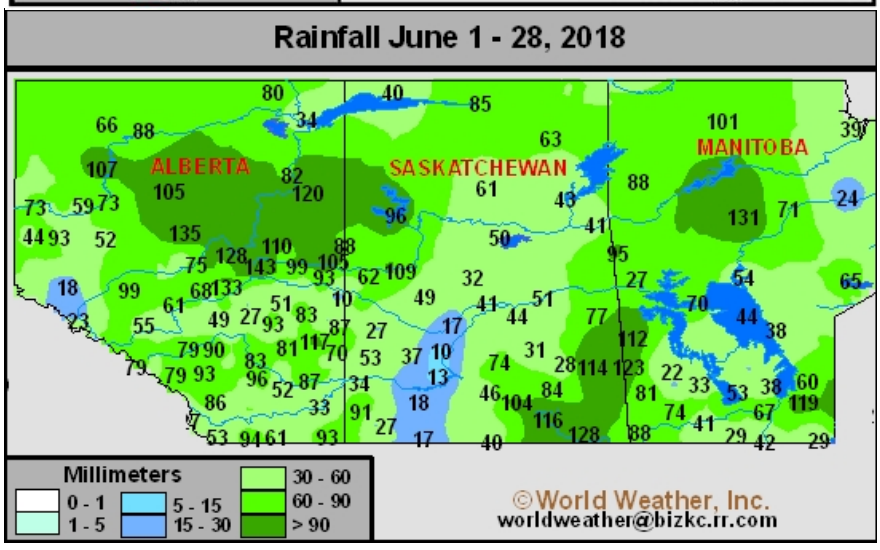
more than 300 millimeters in the region. The amazing thing was that the torrents of rain were just a hopscotch jump away from areas that have received very little rain.

Soil moisture variances across the Prairies will now take center stage along with a summer ridge of high pressure that is expected to prevail in North America during the next few weeks. The ridge promises to keep temperatures warmer biased and rainfall running erratically, but the areas most negatively impacted by these conditions will be fully determined by soil moisture. Those areas with restricted top and subsoil moisture are destined to suffer the greatest stress and the bigger production losses if significant rainfall improvements do not occur soon.

Much of the Prairies are suffering from low topsoil moisture. Short rooted crops or those that have dealt with poor rainfall in recent weeks are showing the greatest symptoms of stress. Subsoil moisture in the drier areas is having the final say as to which crops are going to suffer production declines. Without a general soaking of rain immediately, crops with the poorest topsoil moisture and the lowest subsoil moisture will be the first to encounter extremely stressful conditions in July if rainfall does not become generalized and more frequent and if temperatures continue warmer biased. In contrast, those areas with "adequate" subsoil moisture will likely see to it that crops get into reproduction without serious loss.

Once the subsoil moisture is exhausted crops will start losing production potential rapidly and the soil moisture situation will be very tightly girded to any high pressure ridges that are present in the Prairies aloft. High pressure aloft in the summer will induce subsidence in the atmosphere and that sinking motion will result in a warmer than usual temperature bias and a general lack of rain—both of which are weather features that would harm any and all crops that lie in the driest soil while approaching and entering reproduction.





The most difficult part of the summer weather outlook has been in determining the position and intensity of the high pressure ridge that will dominate North America. A ridge position over the United States that fails to reach north of their border would leave July and August rainfall patterns similar to those of June with an erratic distribution favoring some areas more than others.

A mean summer ridge position over the U.S. Plains that extends north into Saskatchewan and eastern Manitoba would restrict summertime rainfall to Alberta and west-central and northwestern parts of Saskatchewan. Areas to the east would likely be dry or drier than usual.

A mean summer ridge position over the U.S. Rocky Mountain region that extends north into western Canada would likely leave Alberta dry and areas to the east getting progressively greater amounts of rain the farther away from the ridge axis one travels

There are many potential solutions all of which will be somewhat different implications on various locations in the Prairies. The ridge position that has been used in today's July and August rainfall outlook maps assumes the mean ridge position to be in the western U..S. High (continued on page 5)

July, August Weather Warm, But Not Totally Dry

July weather will perpetuate some of the anomalies that occurred in June. Rainfall is expected to be frequent and most significant in interior southern and east-central Alberta as well as in a part of the far northwest. A few other locations in the eastern Prairies may also experience some heavier rainfall, but it will be less likely in the east than in the west.

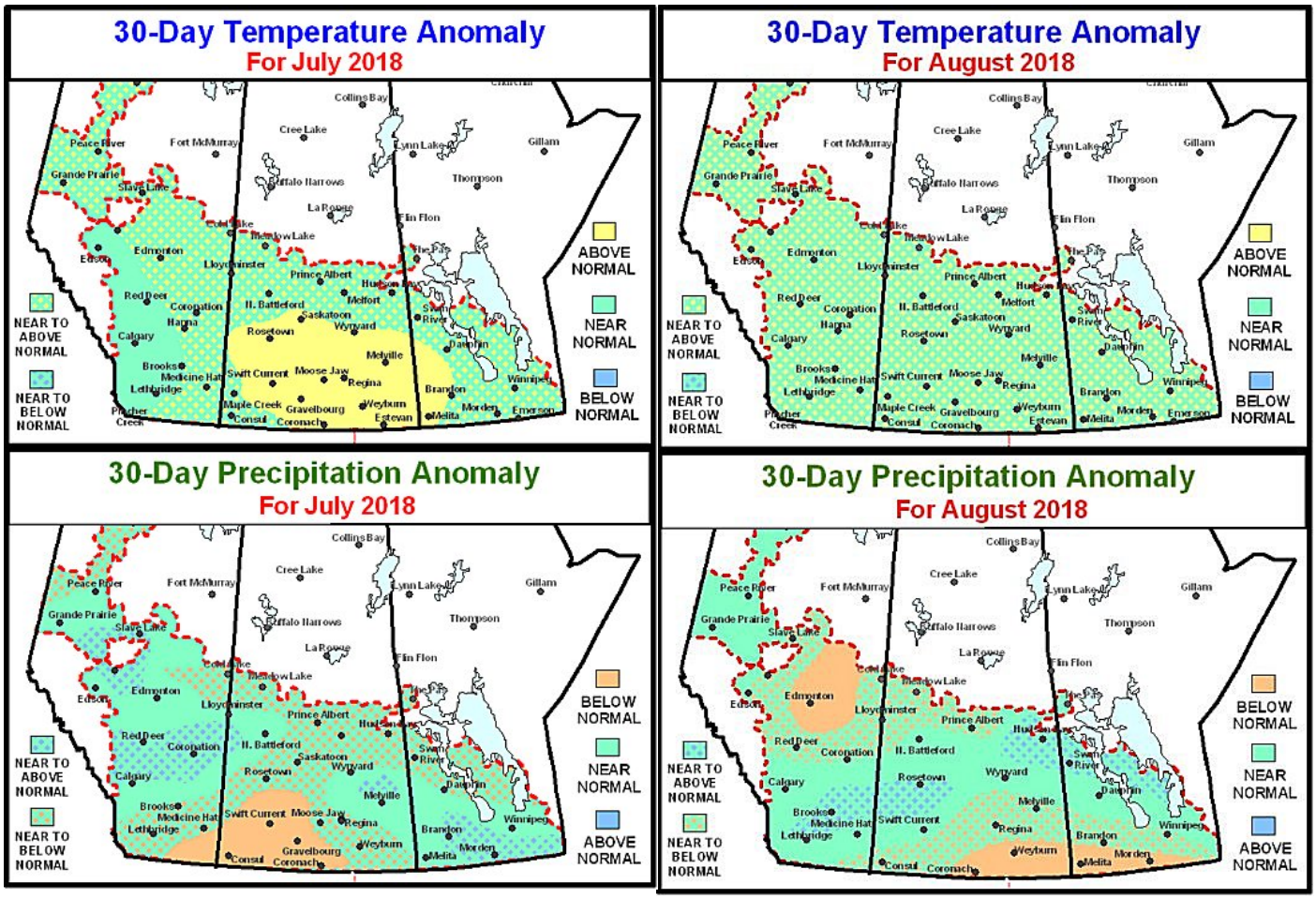
A few strong thunderstorms may occur near the Melville/Yorkton area and "possibly" in southern Manitoba. The one region in the Prairies that has a fair chance of ending up drier than advertised is Manitoba because of a northwesterly flow pattern that is expected to initialize in that area sending weak impulses of rain southeast into the U.S. Corn Belt. These weather disturbances will begin in Manitoba and may not be capable of generating large amounts of rain until after they cross the U.S. border. For now, the outlook is that southern Manitoba will receive near to above average rainfall, but could end up being near to slightly below average.

Most other areas in the Prairies will receive near to below average precipitation with the driest conditions likely near and south of Highway One. The same corridor that is already too dry today from Saskatoon to Eastend, Val Marie and Rockglen will remain that way resulting in more serious crop development issues and lower production potentials.

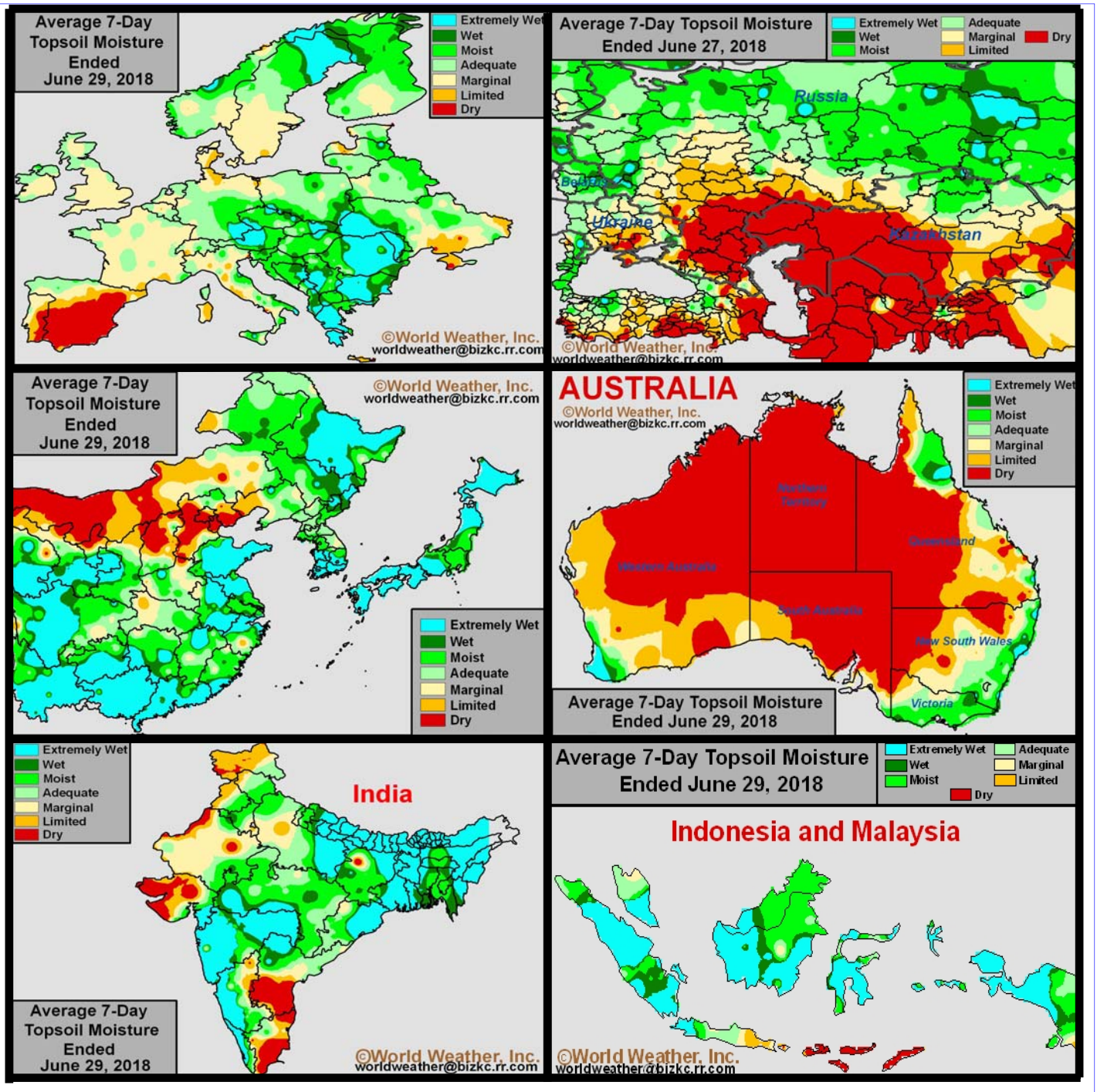
Temperatures in both July and August will have a warmer bias. Alberta may experience more seasonable temperatures at times, depending on the high pressure ridge orientation relative to the Prairies. The warmest temperatures relative to normal will be in the heart of central and southern Saskatchewan and in a part of western Manitoba in July with less extremes relative to normal in August.

August weather will see the mean high pressure position in North America shift farther to the east so that southern Manitoba and southern and east-central crop areas in Saskatchewan are drier than usual. That may allow rain to occur a little more significantly in west-central Saskatchewan and continue periodically in interior southern Alberta. Another area of wet biased conditions will extend from northeastern Saskatchewan through northeastern Manitoba.

The Peace River Region will experience normal precipitation in July and August , although July may have a slight below average precipitation bias. northern Alberta may trend a little drier biased in August.



Selected Weather Images From Around The World



Western Europe is one of a few areas that has become drier in recent weeks while there has been some improvement in soil conditions in many other areas. The United Kingdom, Germany, Belgium, Netherlands, Denmark and southwestern Scandinavia will all experience a net loss in soil moisture and rising crop stress in the coming week to ten days. In the meantime, western Ukraine, Belarus, the Baltic States and Poland have all received sufficient rain recently to ease long term dryness and improve crop production potentials. An improving trend has also occurred in parts of northern China, although Inner Mongolia, Hebei, Shanxi and Liaoning are still running a little too dry. Most of China has very good soil moisture and will see that continue for a while. There will be some expansion of dryness in north-central China in the next week to ten days. India's monsoon has started performing better once again with rainfall sufficient to bolster topsoil moisture recently. Far northwestern India will struggle for more moisture. Eastern Australia has received some recent rain, but needs much more. Indonesia and Malaysia have also trended wetter.

High Pressure Ridge Controls Crop Fate (from page 2)

Plains region and over the U.S. Rocky Mountain region. This predicted ridge will poke its head north of the border periodically restricting some of our summer rainfall potential in southern Saskatchewan and southeastern Manitoba.

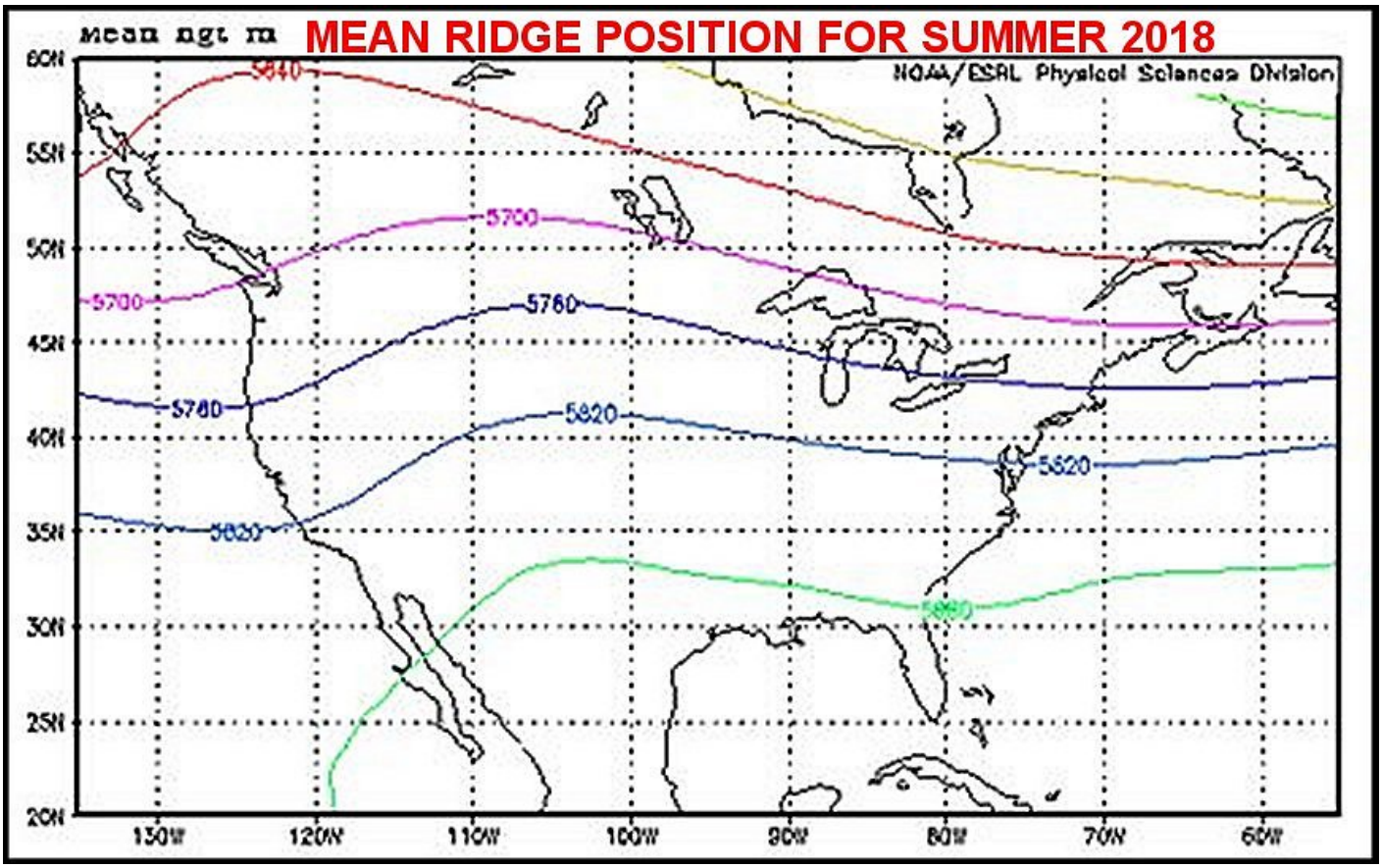
As noted previously a part of interior southwestern and central Saskatchewan is already too dry. Placing a ridge of high pressure into the region noted above would not bode well for significant relief to the driest areas south of Highway One in Saskatchewan. Some dryness will extend downwind from southern Saskatchewan into southeastern Manitoba at times in July and August and that will reduce rainfall in those areas and raise some worry over production potentials.

If, however, the high pressure ridge in the U.S. and Canada moves around from the far western parts of North America at times to portions of the U.S. Midwest and Ontario at other times there would be high expectations for timely rainfall throughout the Prairies and even though amounts were below average we would "eek" by a favorable crop.

Most likely, the summer ridge will waver a bit, but in a more narrowly described region varying from the Rocky Mountains to the western U.S. Corn Belt and Manitoba. This movement will result in some erratic rainfall through the summer, but with rainfall often below average.. Crop moisture will be limited enough at times to stress crops in parts of the region resulting in some lower yield.

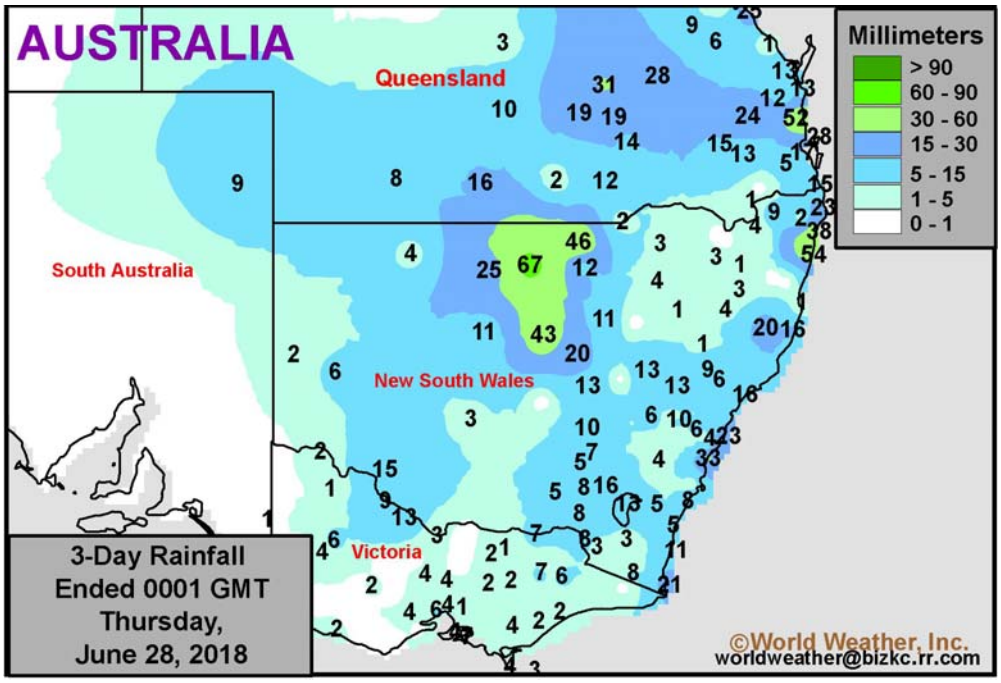
In contrast to the moisture limited crop areas, stress and lower production potentials, there is potential for areas northwest of the high pressure ridge that will receive more favorable amounts of rain and experience a better mix of temperatures during the next few weeks. Resulting production potential may be higher than areas near the heart of the high pressure ridge. That implies that western, northern and some central Alberta locations will do well with rainfall this summer as will portions of northern Saskatchewan. Central and northern Manitoba may also experience some well timed rainfall to support production.

The bottom line to this summer's outlook is favorable for some areas and not so great in others. Unfortunately, this year's outcome will be largely determined the by the positioning and intensity of the expected high pressure ridge. The situation will need to be closely monitored, but the best forecast based on expectations from the ridge will leave south-central and southeastern parts of the Prairies running a little dry with the west-central and northwest should see additional timely rainfall supporting a fair-sized crop, but one that is still small relative to recent years.



A Little Relief In Eastern Australia From Drought

Drought in Queensland and northern New South Wales has been significant. A lack of rain since April has left winter grain and oilseed planting on hold in some unirrigated areas. Rain that fell this week improved topsoil moisture in some areas, but much more is needed before worry over the planting and establishment of 2018 winter crops ends. Portions of Queensland and extreme northeastern New South Wales will receive additional rain Friday into Monday while the remainder of the two states continues dry or mostly dry. The additional moisture will help support winter crop planting, but much more moisture will be needed to ensure successful germination, emergence and establishment.



Southern and central Queensland through the northern half of New South Wales reported anywhere from a trace to 1.00 inch of moisture for the three-day period ending June 28. A few crop areas in Queensland reported up to 1.22 inches of rain while a few in north-central New South Wales received 1.00 to 2.64 inches. The precipitation helped bolster topsoil moisture in the wetter biased locations while some of the rain was too light to seriously alter severe drought conditions. Northeastern New South Wales failed to get more than 0.16 inch of rain leaving that wheat, barley and canola production region too dry for planting. Additional rain Friday into Monday should help fix the situation temporarily.

Winter wheat, barley and canola are normally planted in east-central Australia during May and June. The lack of rain since mid-April has prevented some farmers from planting any dryland seed and those producers who did plant have likely seen very little emergence because of dry conditions. Planting can occur in July, but conditions are going to have be ideal in order to get the crop germinated and emerged with enough chill hours to support the best development potential prior to reproduction. Time is quickly running out. Aggressive planting is expected following the weekend rain event, but worry over follow up rain will then begin. World Weather, Inc. is not expecting any "meaningful" rain in the region again through July 15.

A slowly moving disturbance will help generate periods of erratic rain for central and southeastern Queensland late Friday through Monday. Northeastern fringes of the production region in New South Wales will have brief opportunities for light rain as well. Moisture totals will range from 0.40 to 1.25 inches with local totals possibly reaching over 2.00 inches. Dry weather will be quick to resume and should prevail into July 15. The bulk of production areas in New South Wales will be missed by the weekend event and net drying is expected.

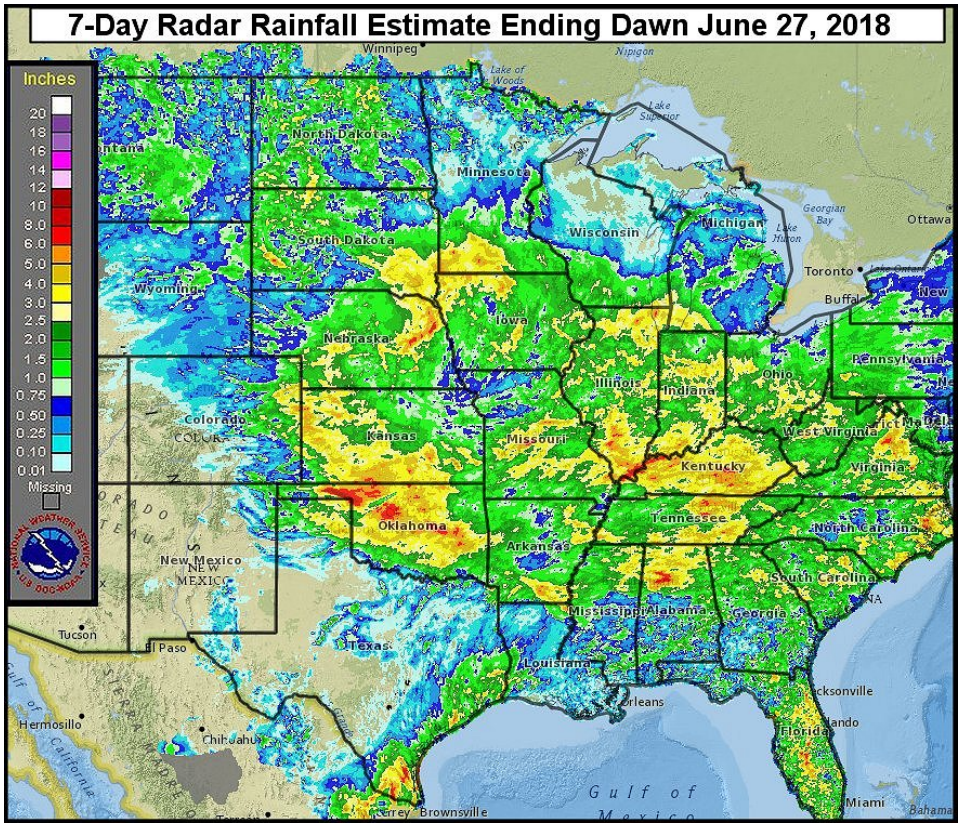
Rainfall through early next week will help keep topsoil moisture near current levels or will increase it in much of Queensland. Winter crop planting, emergence and establishment conditions will improve because of the moisture, but follow up rain will be imperative for successful crop recovery. The lack of follow-up rain through mid-July will lead to a net reduction in moisture that may eventually restore critically dry conditions. Rain in the second half of July would still be soon enough to help improve production potentials, but no later than that. Some production cut seems inevitable for northern and some central New South Wales locations, but conditions could suddenly improve.

Victoria and Western Australia winter crop prospects are favorable due to timely precipitation in recent weeks. Western Australia will see a mixture of timely precipitation and sunshine during the next two weeks that will help keep soil moisture rated favorably. Victoria will be drier biased and likely see a slow reduction in soil moisture. A boost in precipitation would be welcome in most locations later in July.

South Australia winter crop areas are also drier biased and need a moisture boost to support better crop establishment.

U.S. Summer Crop Conditions Good For How Long?

An amazingly well-distributed rainfall pattern continues to occur across key U.S. grain and oilseed producing areas bolstering production potentials above average for yet another year. Much of the concern over dryness noted earlier this season seems to be falling by the wayside, although some traders are still placing much hope in an advertised ridge of high pressure that it might somehow end up over the Midwest in late summer to destroy an otherwise great production year. Instead of moisture shortages, many areas from Iowa and eastern Nebraska through Ohio reported a little too much rain at times in this past week and would welcome periods of drier weather. Soil moisture improvements were also noted for portions of the Delta and southeastern states during the past week. Conditions will remain favorable for aggressive crop growth in much of the Midwest, Delta, and southeastern states through the middle of next week. In the meantime, wheat production areas in the Plains and Midwest would benefit from net drying.



Much of the U.S. Midwest from southern Minnesota, southeast South Dakota, and eastern Nebraska through Ohio, Kentucky, Indiana, and southwest Michigan received significant rain during the past week. Moisture totals for the seven-day period ending this morning ranged from 0.75 to 4.00 inches with local amounts of 6.00 inches or more in Nebraska, southeast South Dakota, southwest Minnesota, northwest Iowa, and portions of the Ohio River Basin. Northeast South Dakota, eastern North Dakota, central Minnesota, central Wisconsin, and the remaining portions of Michigan only received 0.25 to 1.50 inches of rain most often with drier pockets.

Soil moisture is adequate to abundant in a large portion of the Midwest due to recent rainfall. North Dakota and a few neighboring areas in South Dakota and Minnesota have marginally short topsoil moisture, but no large area of critical dryness was noted. Corn and soybean development conditions have been generally favorable in recent weeks for much of the region.

Soft red winter wheat harvesting has been sluggish at times in recent weeks due to the periods of rain. Some grain quality concerns have evolved recently because of frequent rain and warm temperatures. A period of drier weather would be welcome for much of the Midwest to firm up the topsoil and promote better winter wheat maturation and harvest conditions. Corn and soybeans in the wettest areas would likely benefit from a minor amount of drying and some warming, as well.

The Midwest will see a mix of rain and sunshine during the coming week. North Dakota will receive some of the most significant rain with moisture totals ranging from 0.75 to 4.00 inches and locally greater amounts by next Wednesday morning. Rainfall elsewhere will generally range from 0.50 to 2.00 inch with locally greater amounts in Iowa and the Ohio River Basin. Soil moisture will increase for North Dakota during the next few days while the moisture profile remains favorable elsewhere. Corn and soybean prospects will remain favorable while several soft red winter wheat areas dry enough for more aggressive harvesting.

Hard red winter wheat country received abundant to excessive rain at times during the past week. Moisture totals ranged from 1.00 to 5.00 inches most often with several areas in Oklahoma receiving 6.00 to over 8.00 inches. The harvest was disrupted and some head sprouting was suspected in some of the wetter unharvested wheat fields. Dry and warm weather will be needed in the coming weeks to firm up the topsoil and im-

U.S. Summer Crops Good For How Long? (from page 7)

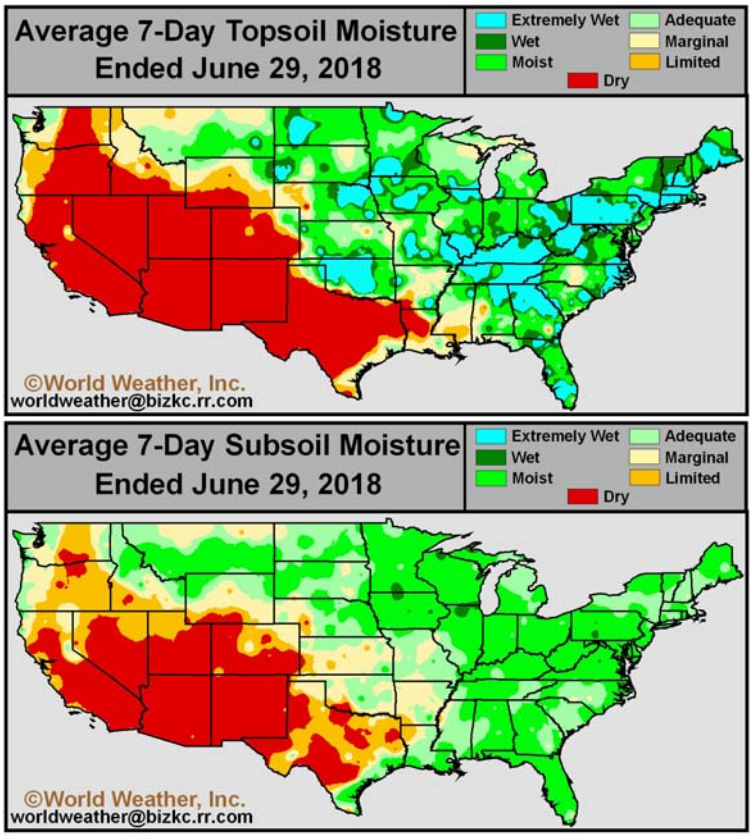
prove harvest prospects.

Much of the central and southern Plains will only see brief periods of light rain during the coming week. Precipitation will generally be too light to counter evaporation, though pockets in northern Kansas and southern Nebraska will receive more than 1.00 inch of rain by next Wednesday morning. Temperatures will be warm to hot with daytime temperatures warming from 90 to 110 degrees Fahrenheit with pockets in the 80s. The warmer and drier weather bias will firm up the topsoil and improve winter wheat harvesting in most locations.

Timely rain was noted for much of the Delta during the past week. Moisture totals ranged from 0.75 to 3.00 inches most often with a large portion of Louisiana only receiving a trace to 0.50 inch. Topsoil moisture improved for most areas outside Louisiana, although subsoil moisture remains short in much of the Delta. Crop conditions improved for the areas that received the greatest amount of rain.

Alternating periods of light rain and sunshine will evolve for much of the Delta during the coming week. Louisiana will receive some of the most significant rain with moisture totals ranging from 0.50 to 1.50 inches by next Wednesday morning. Rainfall elsewhere will range from 0.25 to 1.00 inch and locally greater amounts. The periods of rain will limit drying, but will be unable to significantly bolster soil moisture. Crop conditions will remain mostly favorable despite the lack of rain in several areas. Early season maturation will get off to an aggressive start as well.

Much of the southeastern corner of the United States received rain at one time or another during the past week. Soil conditions were still rated mostly good, but some topsoil moisture shortages were noted in Alabama, Georgia and the Carolinas. Subsoil moisture was still rated favorably and the coming week will present periods of rain to restore topsoil moisture and assure good crop development potentials.



Dryness remains a serious concern for most of the western and south-central United States. Areas from the Pacific Northwest through unirrigated areas of California, the Great Basin and central and southern Rocky Mountains are running very short on moisture. The huge region of dryness extends into central and western Texas and will help support a very strong ridge of high pressure for a little while in the July 5-11 period. High pressure ridges aloft would much prefer to be over dry areas than over wet areas. The advertised ridge of high pressure for the western U.S. July 5-11 makes good sense given the moisture abundance in crop areas across the central and northern Plains and Midwest. The ridge will add heat to an already dry situation in the western United States and the situation is liable to lead to forest fires, water rationing and high cooling fuel demand .

Texas cotton, corn, sorghum, soybean and groundnut producing areas have already endured a serious drought this summer and that is unlikely to change in the next two weeks and perhaps longer. Unirrigated crop production has already been curbed and further declines are likely until significant rain evolves and that is not likely for quite a while.

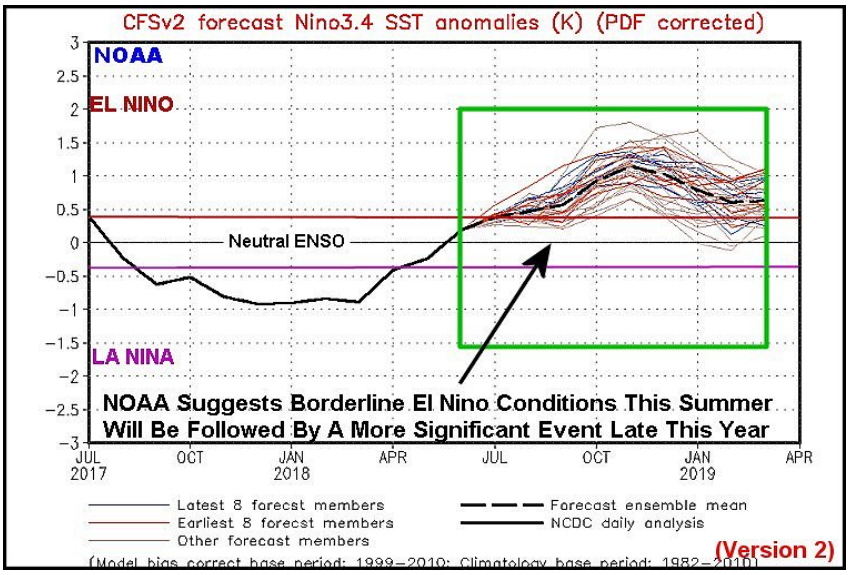
The favorable moisture situation in the United States is expected to prevail into early July. Subsoil moisture is expected to remain good for at least three weeks and if the topsoil dries out quickly many Midwestern crops will move into reproduction with some favorable subsoil moisture to carry on normal development.

A high pressure ridge is expected over the Midwest for a few days during the middle part of next week, but it will be followed by a few bouts of light rain and some milder temperatures. That trend should help conserve moisture losses through slower evaporation and some rain-induced moisture replenishment which could leave U.S. crops in good condition until late month. Greater rain will be needed at that time especially if temperatures are notably warm.

El Nino Potential Rising, But 2018 Canada Crops Not To Be Impacted

Australia's Bureau of Meteorology and the U.S. National Oceanic and Atmospheric Administration have issued advisories about the potential for El Nino evolution later this year. World Weather, Inc. agrees with the potential for El Nino, but the event is unlikely to evolve enough to have influence on 2018 summer crops in the Northern Hemisphere.

Subsurface ocean water temperatures in the entire eastern equatorial Pacific Ocean region have been warmer than usual for months. The warm water has been kept mostly below the surface of the ocean for an extended period of time, but an upwelling current has begun to push the warm water to the surface and the process will continue for the next few weeks.



Ocean surface temperatures have been warming near the equator between the International Dateline and the coast of South America. The warming has not been significant enough to change world weather patterns and it is not likely to reach such a point until September—at the earliest.

If El Nino development does not begin to change world weather patterns prior to September then the Canadian Prairies will not feel its influence until the winter. Canada's higher latitude location is quite often one of the last areas in the world to experience the influence of El Nino.

Some Canadian farmers have shown some concern about the talk of El Nino in recent weeks because there has been a tendency in the past for El Nino events to support drier and warmer biased conditions in the western Prairies. Such a development in this summer would greatly raise fears that a hot, dry, summer will actually evolve as has been predicted by so many entities. So far (knock on wood—to prevent a jinx) the feared hot, dry summer has not occurred except in a few areas across the Prairies. A full blown El Nino added into the mix might change that situation, but the event would have to get started now to have enough time to impact the world before the summer ends.

El Nino could still have some interesting impacts for the Prairies during winter 2018-19 and in the spring of 2019. El Nino normally has its greatest influence on the Prairies during the cold season. Winter is often drier and warmer than usual during El Nino events. This correlation is many times stronger than the correlation with El Nino summers being warm and dry in the western Prairies and a little wetter biased in the east.

Much of the Prairies are already carrying short subsoil moisture. The lack of subsoil moisture has been the byproduct of the 2017 drought and the poor rainfall distribution and warm temperature bias so far in 2018. The forecast World Weather, Inc. has presented in this Prognosticator does not offer a recovery in subsoil moisture levels which is one of the reasons for concern that production may fall in summer 2018 if rainfall continues erratic and light while temperatures are warm. Subsoil moisture is low in many areas from southern Alberta through central and southern Saskatchewan to portions of Manitoba. There are some exceptions, especially in eastern Saskatchewan where significant rain fell earlier this month.

However, if rainfall continues lighter than usual and temperatures are warm through the end of this growing season the odds are high that moisture shortages will remain going into winter 2018-19. If El Nino is in place at that time, there would be a lower than usual potential for a wet winter and we may come into spring 2019 with the same moisture shortages prevailing this year. That makes the outlook for 2019 similar to this year with a big need for improved rainfall in order to prevent dryness from hurting another production year.

The coming El Nino event has some potential to push the Prairies into another year of drier biased conditions and nobody would want to see that. The situation will be closely monitored.