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The Canadian Agriculture Weather Prognosticator

Volume X, Issue IIII | http://www.worldweather.cc | May 17, 2018

Ontario And Quebec

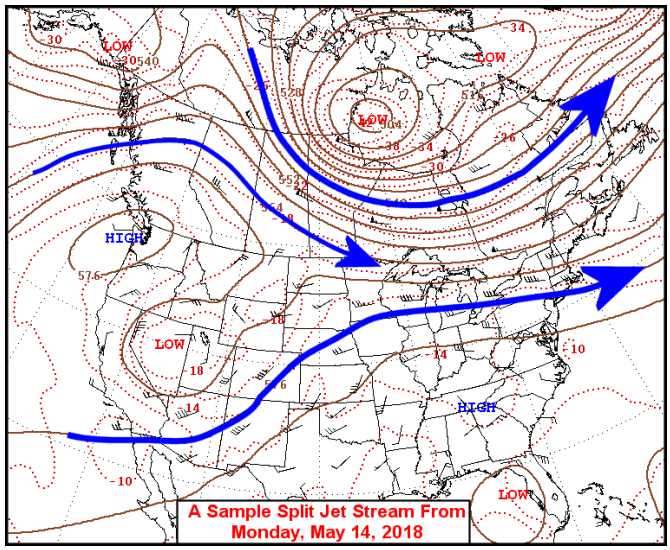
Corn And Soybean Planting Has Begun, But Field Progress Is Behind The Usual Pace. Dry And Warm Weather Is Needed For A While To Further Improve The Environment For Aggressive Field Progress.

WORLD WEATHER ISSUES

- U.S. Planting Progress Advanced Ahead of Average in Many States Due To Net Drying
- SE U.S. Dryness Became Excessive Recently, But Rain Is Now Falling
- U.S. Hard Red Winter Wheat Areas Are Getting Favorable Rain, Although A Bit Late
- Ukraine And Russia's Southern Region Have Trended Drier Biased Recently Raising Concern Over Long Term Crop Development.
- North China Plain And The Northeast Provinces Are Drying Down Raising The Need For Rain Soon
- Western Australia Remains Too Dry For Wheat, Barley And Canola Planting
-

East Prairies Rain May Improve "Briefly"

North America Weather is going to be in transition over the next three weeks. The changing pattern will bring a consolidation in the jet stream removing the split pattern that has prevailed since March. The change will briefly destabilize atmospheric conditions over the eastern Canada Prairies, portions of the Northern Plains and upper Midwest where a temporary boost in rainfall is expected. Once the new pattern sets in drying may resume across some of these areas which makes this period of potential relief extremely important.



The split jet stream has had many different patterns in recent weeks, but quite typically there has been a northern and southern branch to the jet stream. The northern branch has brought frequent bouts of cool air into the central and eastern parts of North America while the southern branch has brought storm systems into the southwestern United States that later moved east northeast through the central Plains to the Midwest. The setup has often resulted in a ridge of high pressure over western Canada and a northwesterly flow aloft in the Prairies. The western Canada weather impact has been to stymie precipitation events except along the front range of the Rocky Mountains in Alberta where precipitation was often greater than usual during the winter and early spring.

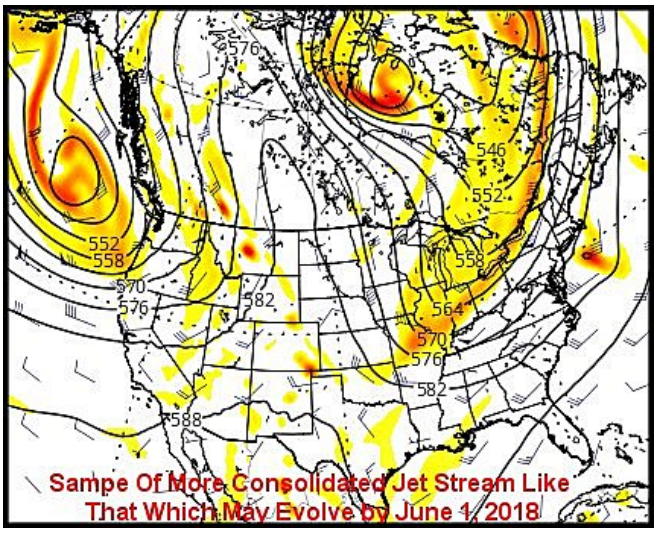
In the meantime, the southern branch of the jet stream created a frequent rain pattern across the U.S. and that resulted in the slowdown in fieldwork early in the planting season. A recent change in the U.S. resulted in warmer temperatures across the Plains and Midwest accelerating evaporation and drying rates between rain events and providing a better environment for planting progress. In the meantime, Manitoba and eastern Saskatchewan have experienced eight weeks of minimal precipitation. The first half of that period of dryness in the eastern Prairies was not very important because April was much colder than usual, but as soon as temperatures began warming the soil began drying out very quickly.

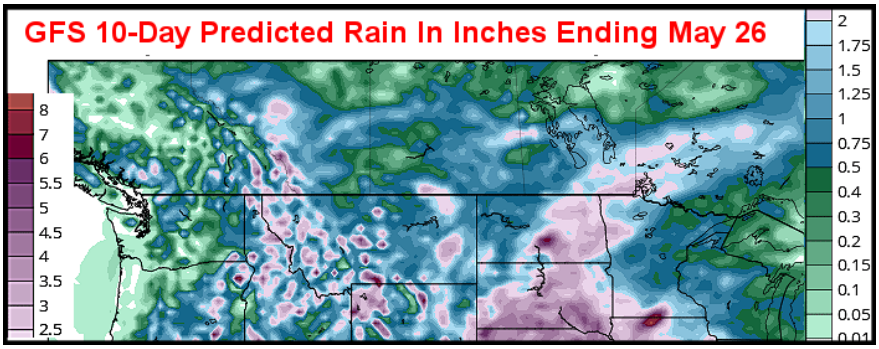
More recently the drier and warmer biased conditions have expanded over a larger part of the Prairies and areas that were running too dry last autumn are quickly becoming too dry and planting, germination and emer-

Eastern Prairies Rain May Improve "Briefly" (from page 1)

gence are at risk because of quickly declining topsoil moisture.

Seasonal changes are beginning to take place. The split jet stream pattern is expected to abate in the next few weeks. In place of the split jet stream pattern will be a new ridge of high pressure that will build up across the southwestern United States and into the high Plains region. Eventually, the ridge is expected to extend into southern Canada. In the process of this change the jet stream will push a few small weather disturbances north through the U.S. Plains and into the upper U.S. Midwest and a part of the eastern Canada Prairies. Showers and thunderstorms will accompany these north to northeastward moving weather disturbances that are caught up in the ridge building resulting in some rain in eastern Canada's Prairies, the upper U.S. Midwest and the northern Plains.





The rain expected will be short lived, but it could turn out to be just enough moisture to improve seed germination, plant emergence and crop establishment conditions. Rain will impact the Prairies Thursday and early Friday with a focus on southern Alberta, Saskatchewan and southern Manitoba. Another rain event is expected late next week and there may be one more event in the last days of May. The three systems may result in "some" short term improvement to crop and field conditions. Once the consolidated jet stream and ridge of high pressure are in place a new bout of drying "may" begin and a new assessment of the long range outlook will be required.

The sample of a consolidated jet stream with a ridge of high pressure (shown below) in the central Prairies is not expected to be the exact pattern that will evolve in June, but something similar will take place. World Weather, Inc. expects the ridge of high pressure to be a little weaker in June and there should be some disturbances that move through the top of the ridge in the Prairies. These weather systems will produce an erratic distribution of rain and perhaps a few pockets of locally heavy rain. However, the general theme of June weather is expected to be a bit more conservative with rainfall limiting the potential for big soakings that would improve long term soil moisture. However, there is potential for some pockets of better weather for short periods of time and that could be a Godsend for some areas that are struggling for moisture.

In contrast to the drier bias that may return to the eastern Prairies later this summer, showers and thunderstorms may resume periodically for a while in the western Prairies. The rain in western and northern Alberta may not be welcome, but as long as temperatures are warmer biased, the region might avoid a serious surplus of moisture. Good drying conditions are expected between rain events. A little later in the summer the wetter bias in western Alberta should shift to the east into eastern Alberta and western Saskatchewan where there may be some timely rainfall to support crops even though subsoil moisture is low.

The key to the summer outlook this year is the exact positioning of the predicted high pressure ridge and its intensity. The 18-year cycle favors timely rainfall for many areas, but when we add in the lingering effects of La Nina and the solar cycle the eastern Prairies turn a little drier and that is why we need to closely monitor trends over the next few weeks. Once the consolidation of the jet stream is complete in June World Weather, Inc. will get a much better idea as to which areas will be wetter biased and which will be drier biased.

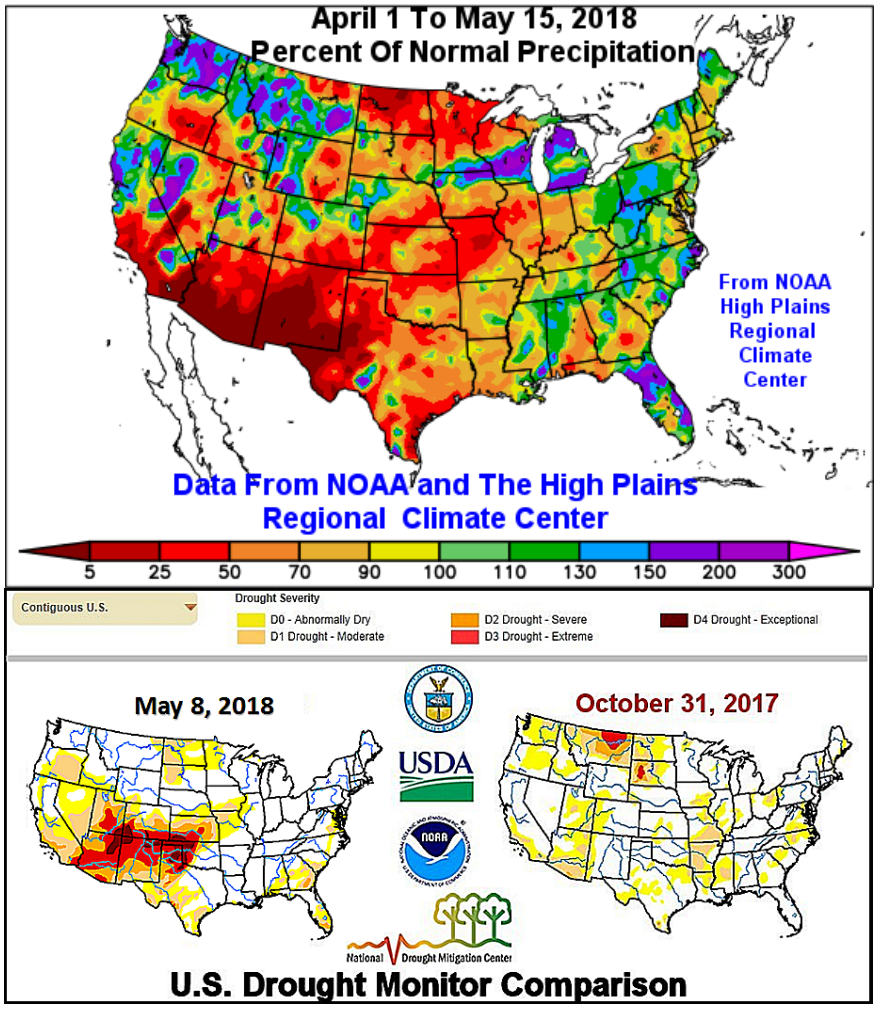
For now, confidence is rising that some relief will come to the eastern Prairies over the next few weeks while conditions in the central Prairies remain a little more tenuous. A short term bout of net drying in the west should greatly improve soil and crop conditions over those recently.

There is some concern about excessive heat next week between today and Friday's rain and that which is possible at the end of next week and into the following weekend. Stress and potential damage may result to crops during the hot, dry, period making rain more important.

Assessing N. America Summer Weather In Detail

UNITED STATES: Moisture totals relative to normal since April 1, 2018 (roughly 6 weeks ago) has been lighter than usual in the northern Plains and in much of Canada's Prairies. Well below average precipitation also occurred from the heart of the Midwest into the central and southern Plains and throughout the southwestern United States. The area is huge, but recent rain has brought timely relief to many of these areas.

Wetter biased areas over the entire six week period have been limited in size and number. Areas from the Pacific Northwest into Montana and parts of Wyoming have been wetter biased along with northern California, western Nevada and a few areas in the interior eastern United States and in Florida. However, in the case of Florida most of the wet weather has occurred quite recently and precipitation was well below average through April.



Drought in the United States actually developed and intensified during the late autumn and winter in the southwestern United States extending from the southern Great Basin and southwestern desert region across West Texas, northwestern Oklahoma and parts of Kansas to southern Iowa and northwestern Missouri on May 8. Drought intensity in the northern Plains that lingered last autumn was further diminished, although recent weather has been dry enough from northern Montana to northern Minnesota to raise worry over a resurgence of drought conditions.

Drought that evolves during the winter season is usually a significant event since it is in the winter that most droughts are put down. Winter precipitation and temperatures normally bring moisture improvements rather than the development of drought. Dryness in the U.S. Delta last autumn was put down, but portions of the region have dried down relatively significantly in the past week

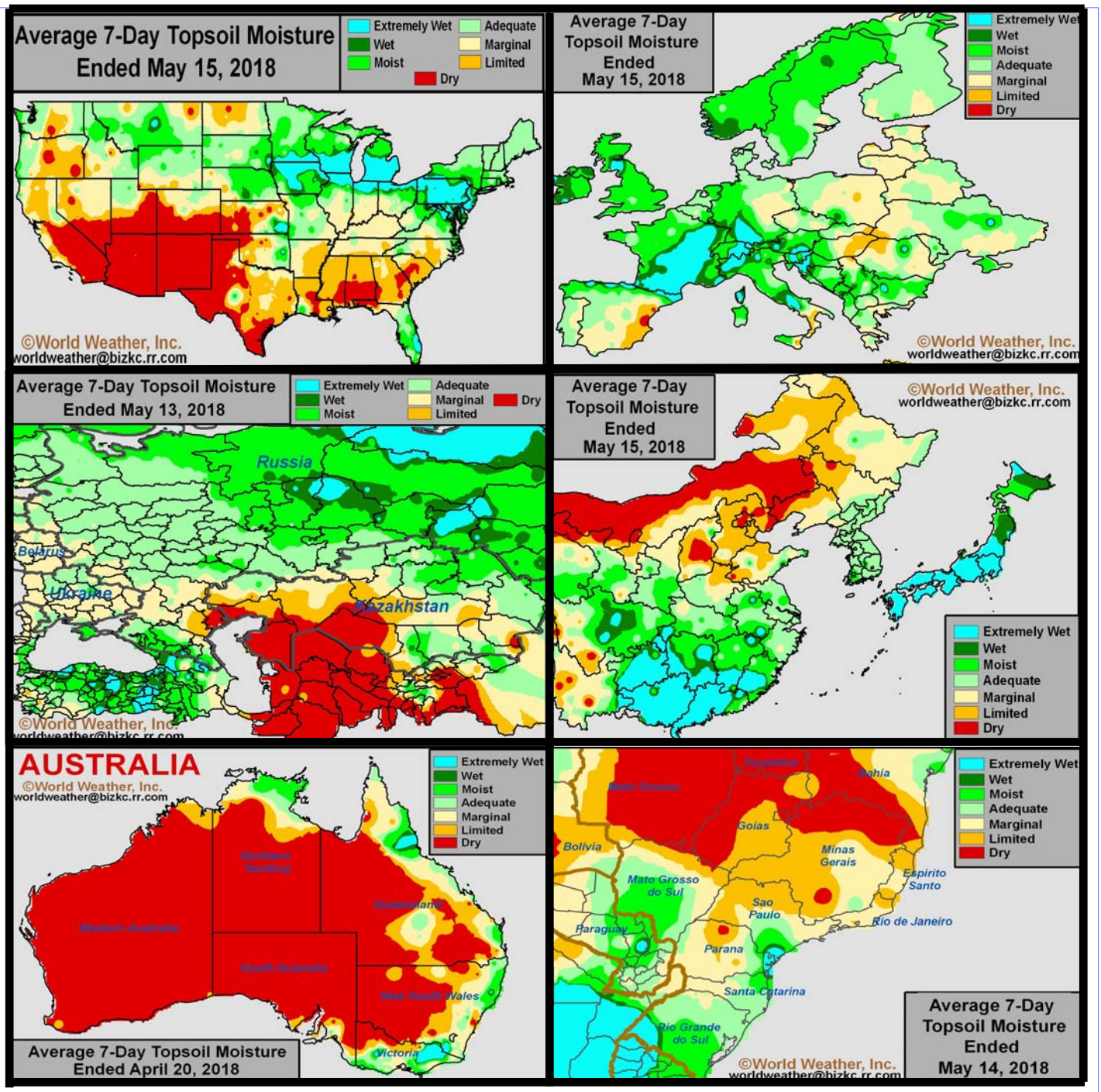
CANADA PRAIRIES: Canada's Prairies have been notably drier than usual since the first of April with emphasis on Manitoba and eastern Saskatchewan where less than 40% of normal precipitation has occurred. Other pockets of extremely dry conditions were also noted in portions west-central Saskatchewan and eastern Alberta. Last year's severe drought that impacted southern and east-central Saskatchewan and some areas of southern Alberta seems to have relocated more into southern Manitoba and southeastern Saskatchewan.

However, with that said about Canada's drought, there is still a large part of the central and eastern Prairies suffering from low subsoil moisture and that has many producers concerned about the long term outlook for crops in the Prairies. The past six weeks of well below average precipitation in the Prairies has resulted in topsoil moisture declines, especially in the past few weeks following the snow melt season.

Topsoil moisture in the Prairies was abundant when snow finally melted in mid- to late-April. Substantial frost in the ground at that time left much of the melted snow standing around in fields until frost left the region. Frost dissipated in many areas during the first half of May and producers and analysts have been surprised at how quickly the moisture situation in Canada has gone from too wet to quite dry in the top few inches of soil. The situation is common in southern and eastern Alberta and across many areas of Saskatchewan into Manitoba. Most of the drying has been in the top few inches of soil, but with

(CONTINUED ON PAGE 5)

Selected Weather Images From Around The World



Soil moisture has lightened up in many key crop areas around the world recently and change will have to occur soon or there will be some interesting changes in market mentality as worry over developing dryness increases. Western Australia has been dry for weeks and needs significant rain to plant its wheat, barley and canola crops. Recent rain in Victoria has been good for planting there, but rain is needed elsewhere. Second season corn in Brazil needs rain and some is expected to fall through the weekend offering at least a temporary break from the stressful environment that has occurred in recent weeks. Southern Russia and Ukraine continued to dry out over the past ten days, although some recent rain offered a temporary reprieve and more is expected in the coming week. U.S. soil moisture decreased in many areas, as well, but rain is bolstering moisture today in the southeastern states and additional relief is likely there in the coming week. Eastern Europe will also receive some rain to reduce moisture stress in this coming week. In the meantime, Argentina will get a chance to dry down after becoming very wet earlier this month.

Assessing N. America Summer Weather (from page 3)

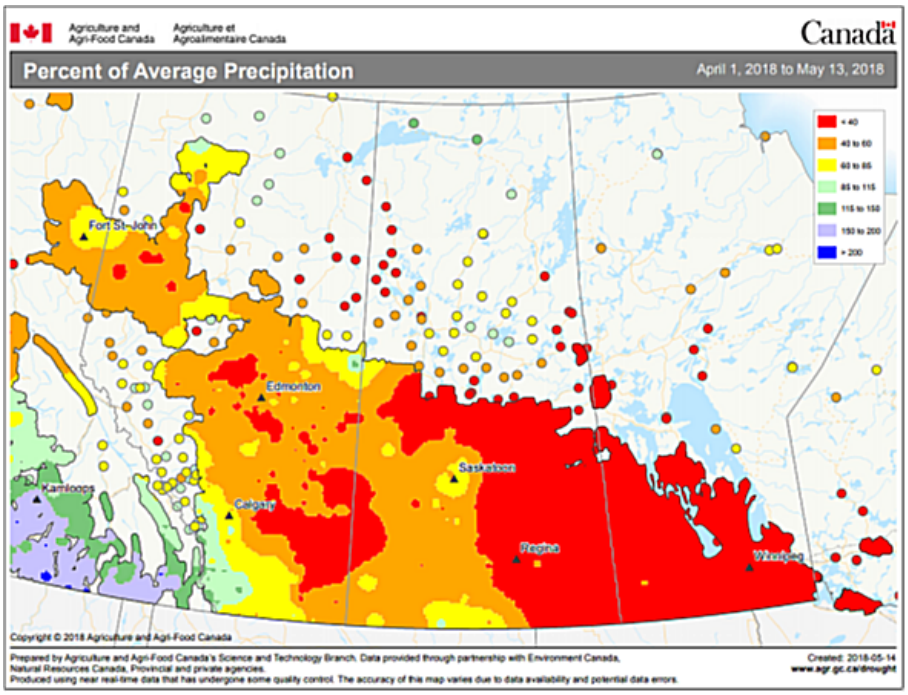
this being the planting season it is not a good time for topsoil moisture to be depleted. Subsoil moisture in many areas across the Prairies is also low following the drought of 2017 that took moisture surpluses from 2016 and exhausted them after months of restricted precipitation and warm weather.

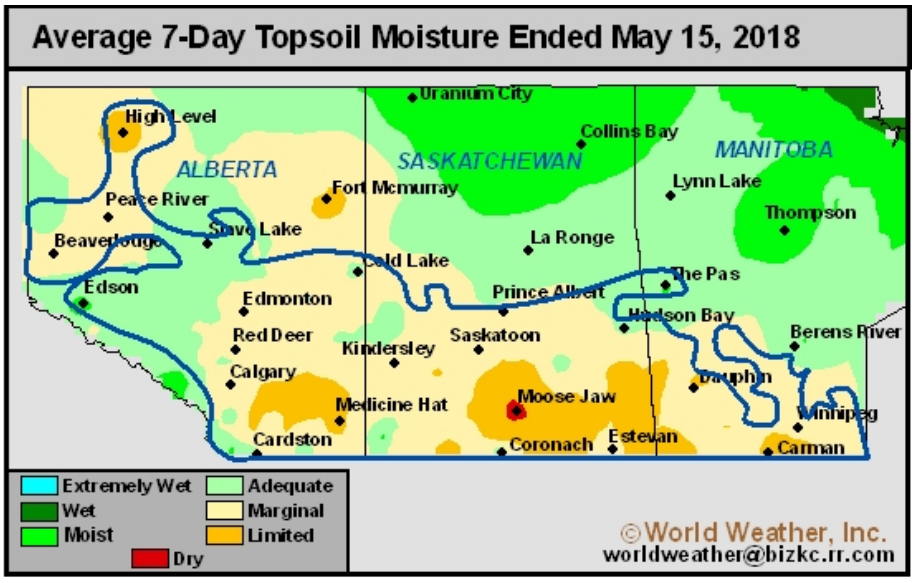
U.S. topsoil moisture on May 15 was rated the worst since the same time in May 2012, which later became a serious drought year. There have been other years in which mid-May was dry like this and it did not lead to severe drought, but it is interesting to note when the last dry mid-May occurred.

Worry has increased in many areas across North America from northern Mexico into Canada's Prairies about the huge area that is reporting dry or drier than usual conditions. There have already been many predictions of huge wildfire and forest fire potentials for 2018 because of dry tender from northern Mexico through the southwestern U.S. desert region and southern U.S. Rocky Mountain region and also in portions of the Canadian Prairies.

Mexico's dryness has been mostly confined to northernmost parts of the nation, but rainfall has been well below average since last autumn because of the La Nina event that prevailed during the autumn and winter months. Soil moisture in those areas is also quite low with some water supply below average and concern about ongoing dryness in the region until the monsoon season arrives in late June and July.

Mexico's soil moisture reflects the lack of rain in northern areas, but in all fairness Mexico is normally quite dry at this time of year when normal winter precipitation events have all ended weeks ago and early spring dryness and heat settle in during April and May.





North America temperatures were often colder biased during the winter and early spring. April was unusually cold and in some cases running at record cold levels from the Canadian Prairies into the north-central United States. However, the cooler biased conditions reached from one end of the continent to the other at times. The four-month period of January through April in the northern U.S. was one of the top 3coldest four month periods since 1895. The other two years were 1899 and 1936.

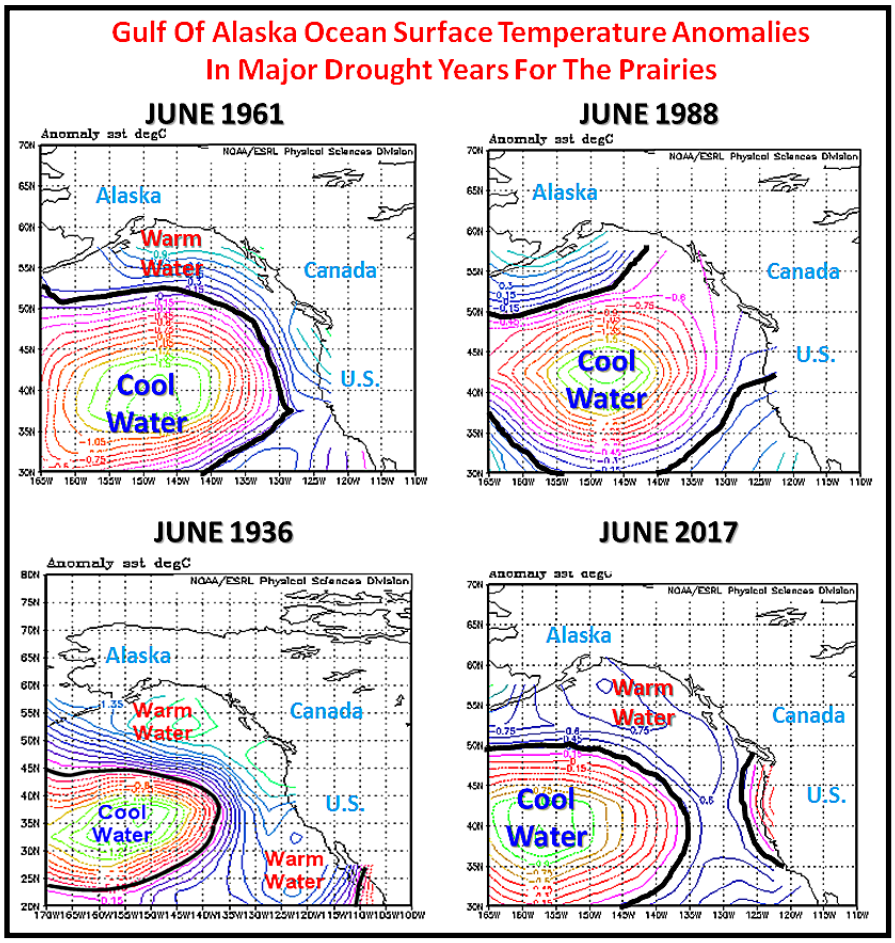
World Weather, Inc. used the anomalous 4-month period as an indicator for predicting May temperatures in North America. The fourth month anomalous period in 1899 led to colder than usual western North America temperatures and warmer than usual conditions in the central and eastern parts of the continent. 1936, however, predicted most of the North American continent would experience warmer than usual temperatures in May and the analog from 1936 looks as though it will veri-

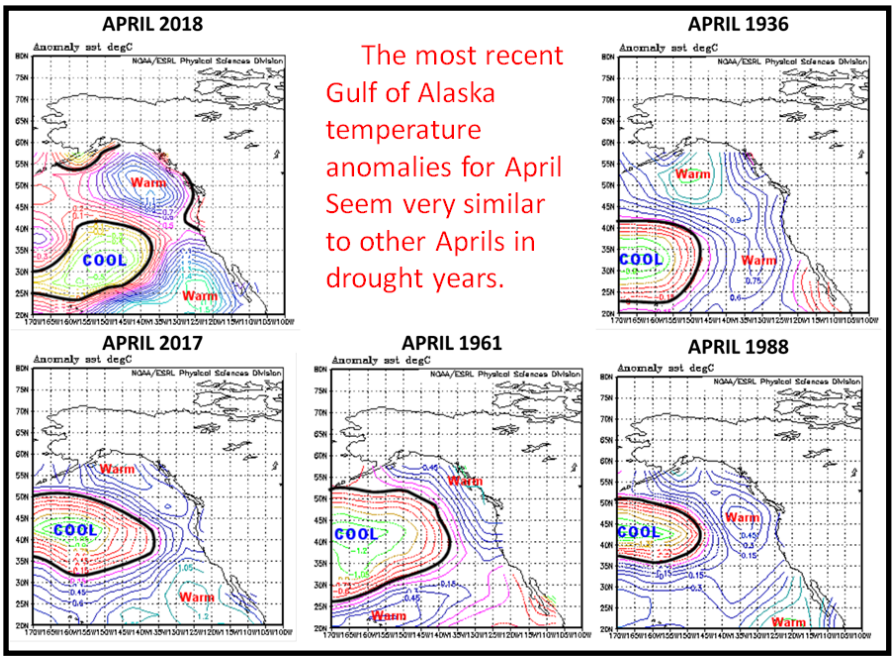
Assessing N. America Summer Weather (from page 5)

fy well except in eastern parts of Canada where temperatures may end up a little cooler biased.

SUMMER OUTLOOK INFLUENCES

The summer of 1936, of course, was one of the worst droughts in North America recorded history and if the parallel continues the precipitation anomaly predicted by that analog will be drier biased for many areas. The 12-month Standardized Precipitation Index (SPI) for the United States ending August 1936 was looking quite similar to the SPI for the six months ending May 5, 2018. The 1936 anomalies are shifted farther east relative to this year. Remember that temperature anomalies in the first five months of 2018 have closely matched those of 1936 and there are at least some parallels to the precipitation distribution in recent months – not that the trend will necessarily continue, but it is very interesting.





The trend with 1936 does not stop with the temperatures and rainfall. Notice the Gulf of Alaska Ocean temperature anomalies for the Canadian Prairies drought years of 2017, 1988, 1961 and 1936 and then notice the anomalies for this year.

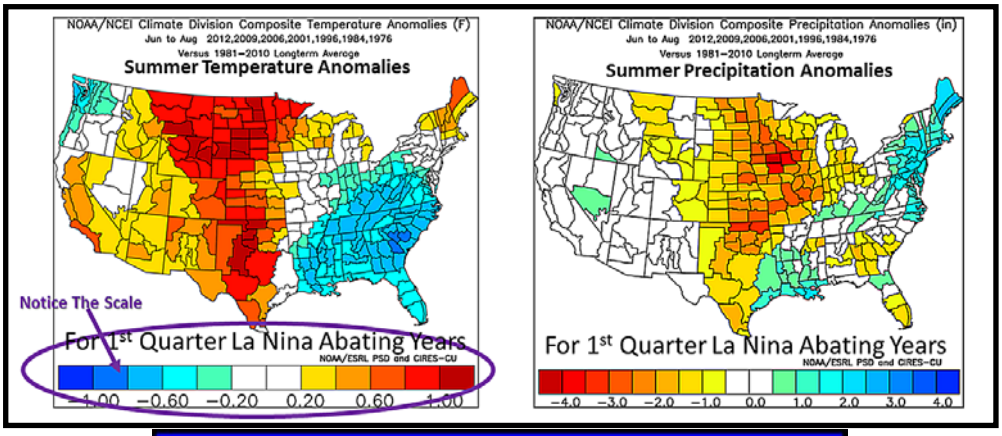
The past few months have demonstrated a consistency of similar anomalous Gulf of Alaska Ocean temperature anomalies that occurred in the months that preceded the major drought years. It is very important to note that there are other times that similar surface water temperature anomalies have occurred without inducing drought, but when we make other comparisons with temperatures and rainfall and add in a few other similar features like those associated with the solar cycle and abating first quarter La Nina events the parallel becomes much stronger.

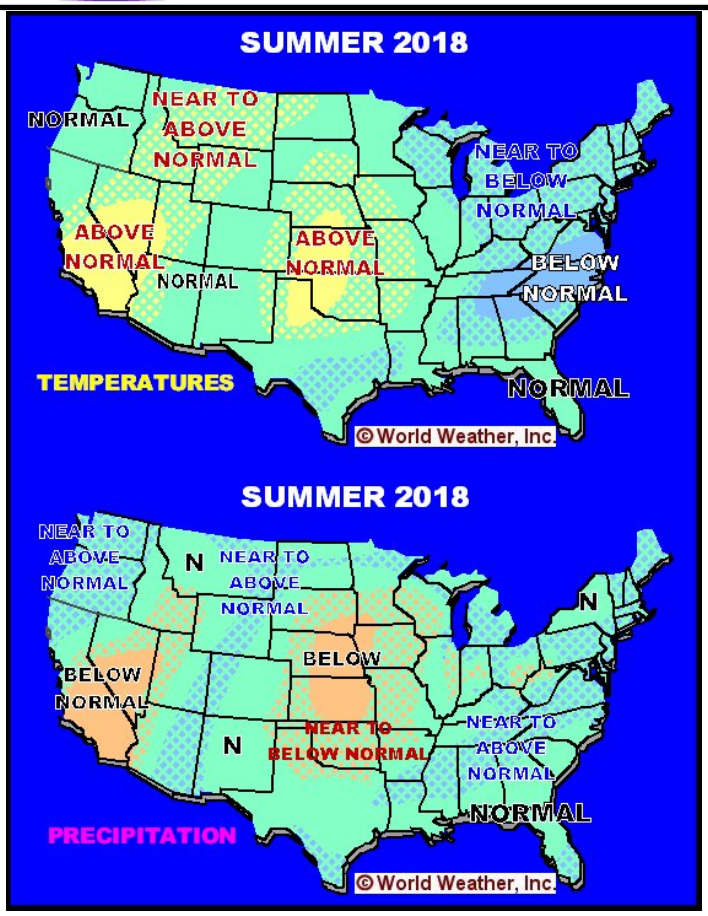
Earlier this year, World Weather, Inc. conducted a study of first quarter abating La Nina events followed by neutral ENSO conditions during the balance of the growing season. The study suggested a strong correlation among seven years that fit the correlation and that there would below average precipitation in the Plains and western Corn Belt during the summer season. Please notice where the greatest below average precipitation bias is advertised and go back to page 8 and look at where the 1936 dryness occurred. It will not take

Assessing N. America Summer Weather (from page 6)

long to see a similar pattern in the data.

Temperatures in the abating La Nina study show warm weather in the Great Plains, Canada's Prairies and the Rocky Mountain States as well as the southwestern U.S. The 1936 anomaly has most of the North American continent warmer than usual as has been during the first half of May. The 1936 Parallel had eastern Canada with a slightly cooler than usual bias, but nowhere else. Interestingly, the abating La Nina study years have the eastern U.S., Midwest, Delta and southeastern states with a slight cooler than usual temperature bias.





The cooler bias for this summer suggested by the abating La Nina year study may verify well because of the influence from the solar cycle minimum that is expected this year. Cool bouts of air are expected to impact eastern North America this summer because of the approaching solar Minimum and that should help the La Nina abating years parallel verify quite well.

So, you might be confused by now trying figure out whether we are going to have a 1936 style drought or not. World Weather, Inc. is sticking very closely to its previous summer weather outlook for North America offering a pattern similar that has occurred with other abating La Nina years because of the similar solution that comes from, 1936 and another pattern that is prevailing in the Lunar Cycle. We may be erring on the wet side of actual anomalous weather and it could turn out drier in the Plains and western Corn Belt if the 1936 parallel is stronger than the abating La Nina and Lunar Cycles.

1936 cannot be repeated because of the influence from the Solar Cycle leaving the eastern parts of North America with a cooler and sometimes showery pattern. However, drought that is already present in the southern Plains, southern Rocky Mountain region and southwestern desert region will help to reinforce heat and dryness in those areas once the summer ridge of high pressure builds up during June and July.

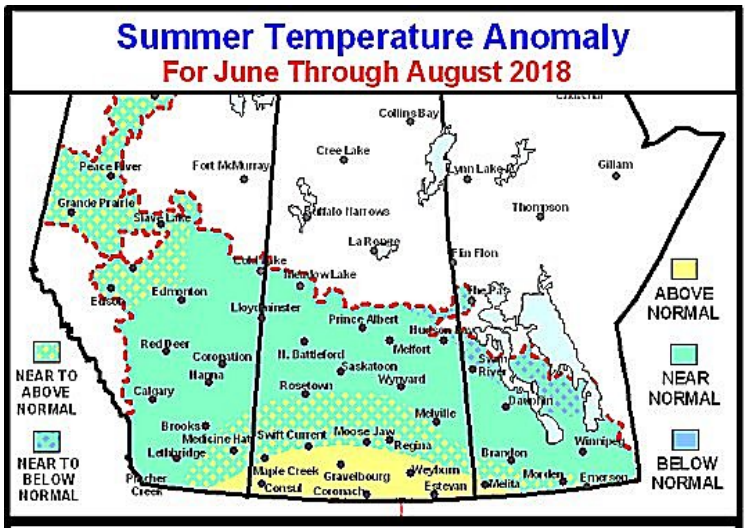
A short term period of improved precipitation is expected over the next three weeks in the U.S Plains and eastern Canada's Prairies. The increase in precipitation will result from the development of the summertime ridge in the central and interior western U.S. and a general lifting of the jet stream into the northern U.S. and southeastern parts of Canada's Prairies. The current ridge over western Canada is expected to break down in these next three to four weeks as the new ridge builds northward from the interior western and central United States. The breakdown of western Canada's ridge will bring on a few timely opportunities for rain in the central and eastern Canada Prairies and the northern U.S. Plains easing some of the recent dryness. However, once the new ridge is in place, July and August will trend drier than usual again in the south-central and southeastern Canada Prairies, the U.S. Plains and western Corn Belt.

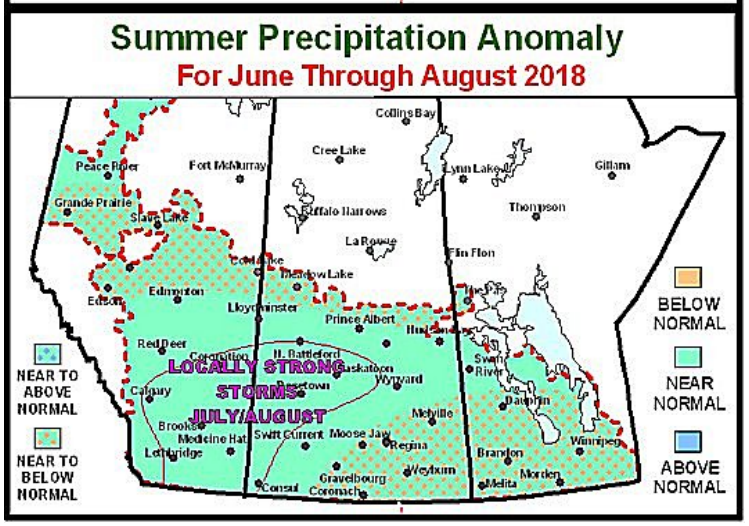
Assessing N. America Summer Weather (from page 7)

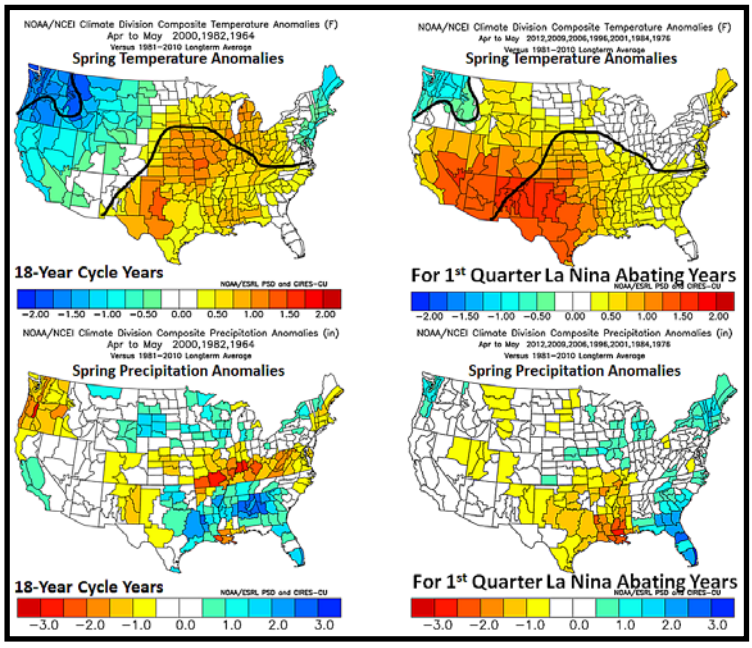
The intensity of the July/August ridge will be determined by how much rain falls in the Plains and Prairies during this transitional period of weather during the next three to four weeks. The greater rain amounts and frequency the weaker the ridge of high pressure will be. Cold ocean temperature anomalies in the Gulf of Alaska may be abating or weakening during the summer and so might the warm water between Hawaii and California and those changes will help keep the ridge intensity just weak enough for disturbances to move from the U.S. Pacific Northwest into the Prairies at times during the summer providing some timely rainfall in southern and eastern Alberta and western and central Saskatchewan. The driest areas in the Prairies should end up being in southeastern Saskatchewan and Manitoba and that dryness will extend southward into the western Corn Belt and part of the Great Plains.

Bouts of cool air in the eastern U.S. will help conserve soil moisture so that if rainfall is erratic and light as expected at times crops will still develop well because somewhat slower evaporation rates at times.

By the way, the La Nina abating year study has verified relatively with in the past couple of months. There has been a timing delay with the anomalies starting about two weeks later than predicted, but the trends are there and if they have verified well for the spring they might just do well this summer, also.







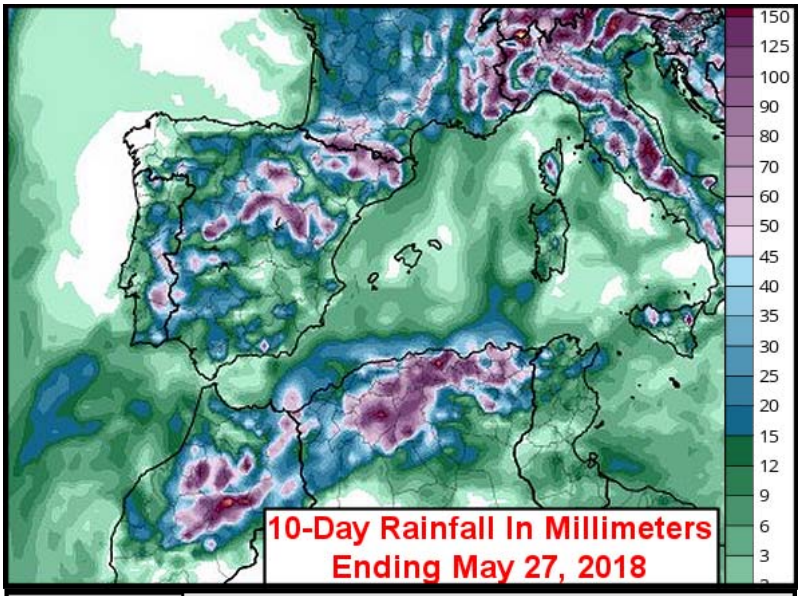
CONCLUDING REMARKS

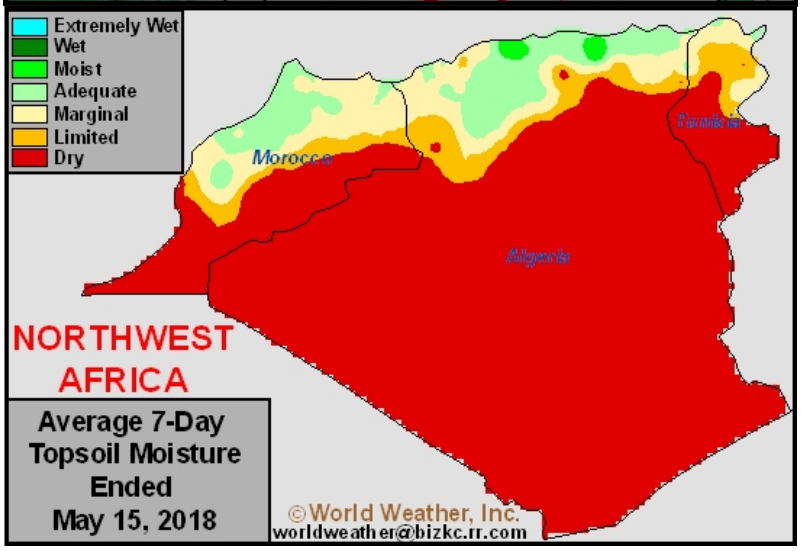
The bottom line is summer weather is expected to be drier biased in the Plains and western Corn Belt and temperatures a little warmer than usual and that may lead to some crop moisture stress. A full blown drought like that of 1936 is not likely, but there may be a little taste of 1936 in the U.S. Plains and Canada's Prairies at times. Canada will see rainfall a little more often than in the U.S. Plains, especially from southern and eastern Alberta through western and some central Saskatchewan locations while the driest areas will be from southern Manitoba and southeastern Saskatchewan into the U.S. Plains and western Corn Belt.

Please do not forget that the next three to four weeks will generate some welcome rainfall in eastern Canada's Prairies and parts of the western Corn Belt and Great Plains, but as time moves along the drying trends should settle in. Eastern U.S. Midwest crop production will be more successful than the western Midwest thanks to milder temperatures at times. Ridge presence and intensity will be strongest in North America during July, August and early September.

Northwest Africa Rain To Delay Harvest Progress

Portions of Northwestern Africa's winter wheat and barley production region will experience a boost in rainfall intensity and frequency in the coming week resulting in more threatening delays to harvest progress and some grain quality concerns. Recent rainfall from Morocco through northern Algeria to Tunisia has not had much impact on field progress or crop conditions because of its erratic distribution and infrequent occurrence. Crop conditions have been mostly good, but that may change during the balance of this week and weekend as rain develops more significantly.





Rainfall in the seven-day period ending at dawn Wednesday was restricted to much of northern Algeria and portions of Tunisia while Morocco was left dry. Moisture totals ranged from a trace to 0.60 inch with local totals to 1.00 inch. Much of the significant rain was reported away from the coast and it was erratically distributed so that most areas experienced net drying conditions for the week. Net drying is needed at this time of year when wheat and barley normally mature and are harvested.

Topsoil moisture was rated marginally adequate to slightly short Tuesday of this week while subsoil moisture was still adequate enough to support ongoing crop development in the most immature crop areas. Lighter and less frequent rain recently has helped to induce a general firming of the soil which is perfect for the end of the growing season and the advancement of harvesting.

Scattered showers and isolated thunderstorms will frequently evolve across Morocco and northern Algeria's main winter crop production areas through Monday. Drier weather will evolve Tuesday and next Wednesday, although a few isolated showers will linger to produce very light amounts of rain infrequently. Moisture totals through next Wednesday morning will range from 1.00 to 5.00 inches with a few locally greater amounts. Alternating periods of light rain and sunshine will evolve for these areas May 24-30.

The periods of rain will frequently slow or delay harvesting over the coming week and the frequency and intensity may be too much to preserve grain quality. Some wheat and barley quality declines are possible and the situation will need to be closely monitored. Soil moisture will likely increase because of the rain resulting in some muddy field conditions in at least a part of the region. Harvest weather will gradually improve during the last week of May, although a few days of dryness may be needed in the wetter biased locations before aggressive harvesting can resume.

Tunisia's anticipated rain will be much lighter and less frequent than that in Morocco and Algeria resulting in a better crop maturation and harvest environment. Some disruption to fieldwork is expected, but the impact will be brief and minor to the overall condition of unharvested crops.

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