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The Canadian Agriculture Weather Prognosticator

Volume XIIII, Issue XIIII | http://www.worldweather.cc | March 2, 2023

World Weather At A Glance

- Argentina continues in its worst drought since 2009 and that drought did not end until May
- Brazil's soybean harvest is still well behind the usual pace because of wet weather and the pace will only improve gradually. Interior southern Brazil needs to dry down soonest.
- India's rainfall has been limited this winter and February temperatures were warm adding some downward pressure on winter crop production
- China's rapeseed region is beginning to dry out
- Eastern Australia rainfall has been very limited in recent weeks raising concern over wheat, barley and canola planting conditions this autumn
- U.S. hard red winter wheat areas are still too dry in the west
- Russia, Ukraine and much of Europe soil moisture is good for the start of spring crop growth

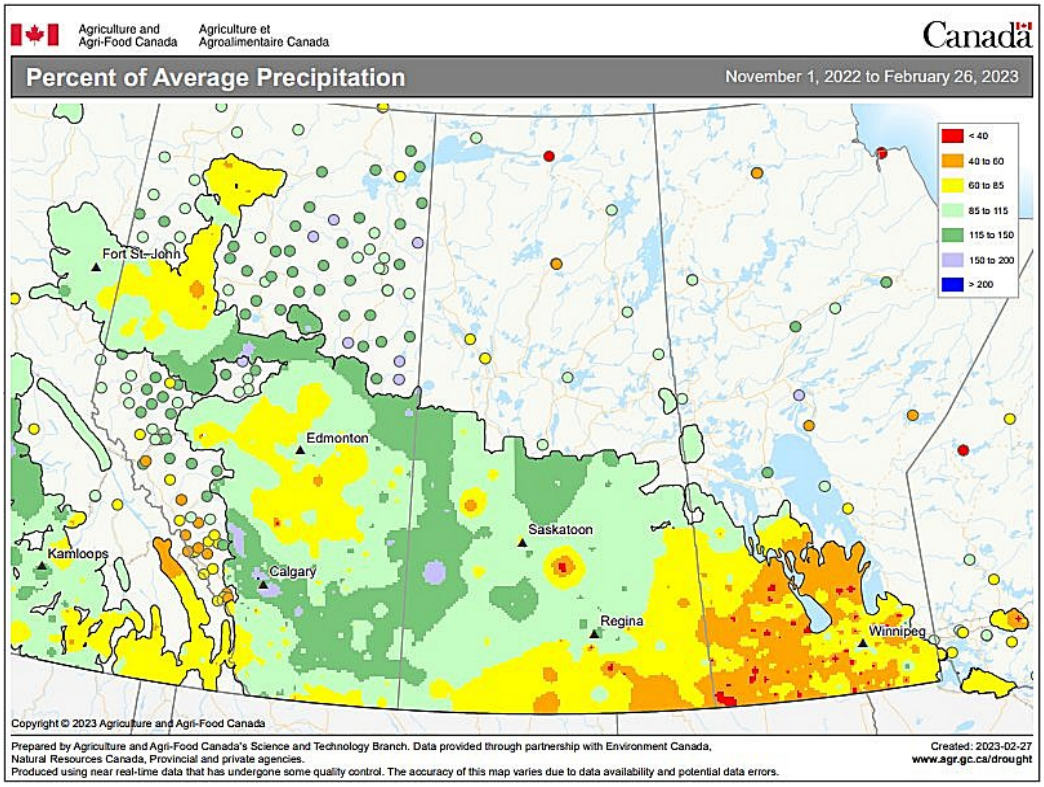
Spring To Start In Drought For Some

February precipitation was inadequate in changing drought status across the Prairies. Precipitation was below to well below normal from the east-central two-thirds of Alberta through all of Saskatchewan to all of Manitoba. The only greater than usual precipitation occurred in southern portions of the Peace River region and areas south southeast from there along the front range of Rocky Mountains.

The lack of precipitation in February occurred with temperatures averaging relatively close to normal for the entire month. However, the latter part of February was much colder and the early part of the month was quite warm. The combined impact of weather on drought status across the central and western Prairies was minimal.

For the winter season, precipitation was near to slightly greater than usual from the interior southern parts of Alberta through western Saskatchewan to north-central Saskatchewan. Northern fringes of Alberta crop country from the Cold Lake and Lloydminster areas to Slave Lake were also a little wetter biased, but with frost in the ground and much of the precipitation occurring as snow it will be very difficult to get much change in soil conditions when the snow melts.

In the meantime, precipitation for the winter was below to well below



Spring To Start In Drought For Some (continued from page 1)

normal in Manitoba and eastern and southern parts of Saskatchewan as well as northern parts of the Peace River region and in parts of central and interior northern Alberta. The drier bias in the eastern Prairies was welcome after last year's record setting precipitation. Less winter moisture was desired to avoid spring flooding in 2023 and that may have been accomplished although there are still a few more weeks of cold weather lying ahead.

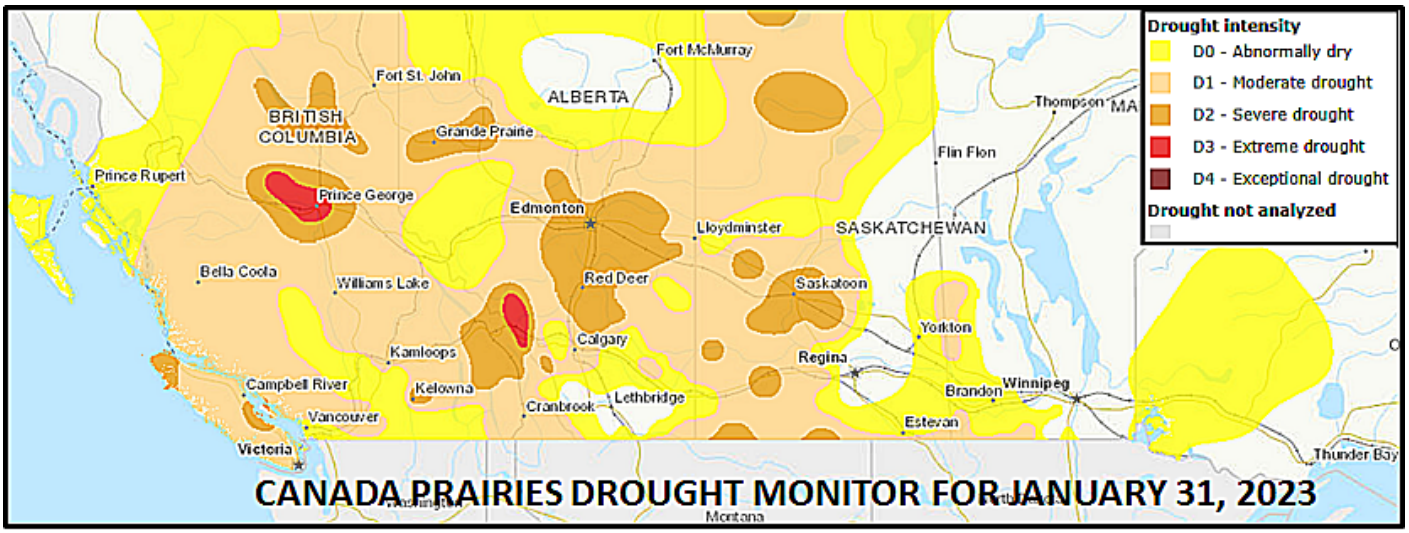
There have been a number of reports scattered across the Prairies of limited frost beneath the snow. Some of that has occurred because of bitter cold conditions holding off until snow was on the ground. For other areas the limited frost is a byproduct of ongoing drought. Fields that are chronically dry had little to no moisture in the ground prior to the freeze season and without moisture in the ground there cannot be much frost.

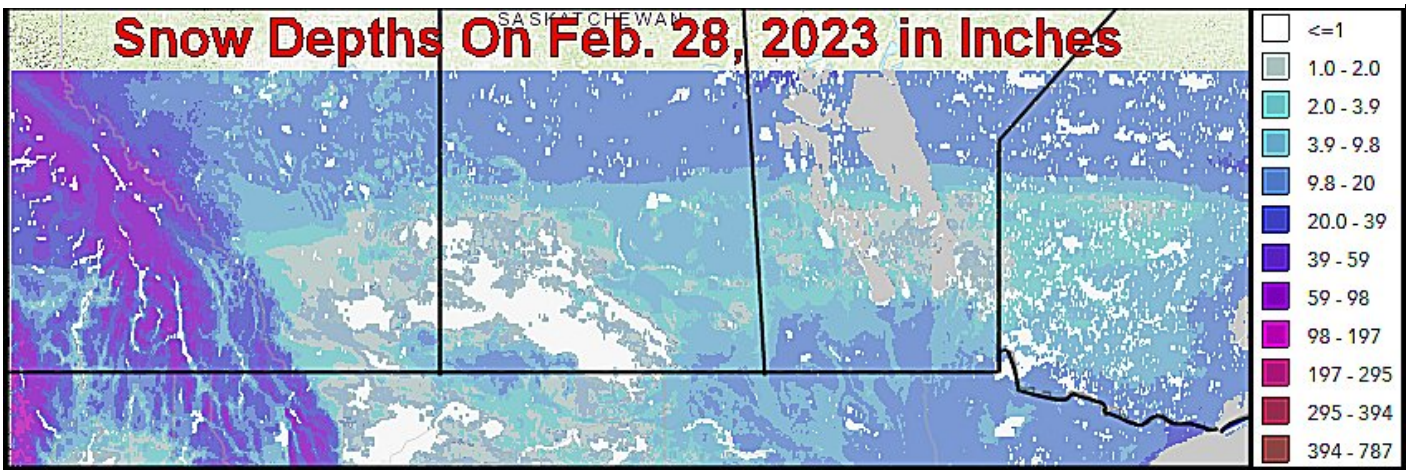
The limited frost situation should open the door of opportunity for late winter and early spring precipitation events to improve topsoil moisture. However, precipitation must fall in great enough quantities to provide the moisture needed to improve topsoil conditions in time for planting.

Snow cover is greatest across the northern 25-30% of the Prairies where 4 to 10 inches are common. Another region of significant snow cover is in southern Manitoba where a similar amount of snow is present. Most other areas have less than four inches with a big part of west-central and southwestern Saskatchewan and southern Alberta reporting little to no snow on the ground.

Cold air will be present during much of March which will limit the potential for generalized precipitation and most of that which does occur will be in western and southern Alberta and southwestern Saskatchewan. Not much other precipitation is expected until late in the month with some of the first significant warming attempts to reach the Prairies. Late March and April precipitation will be critical in supporting early season planting.

There is potential for wetter weather in late March and especially April, but confidence is still a little low over how significant the moisture will be. Drought will still be dominating the Prairies during this period of time.





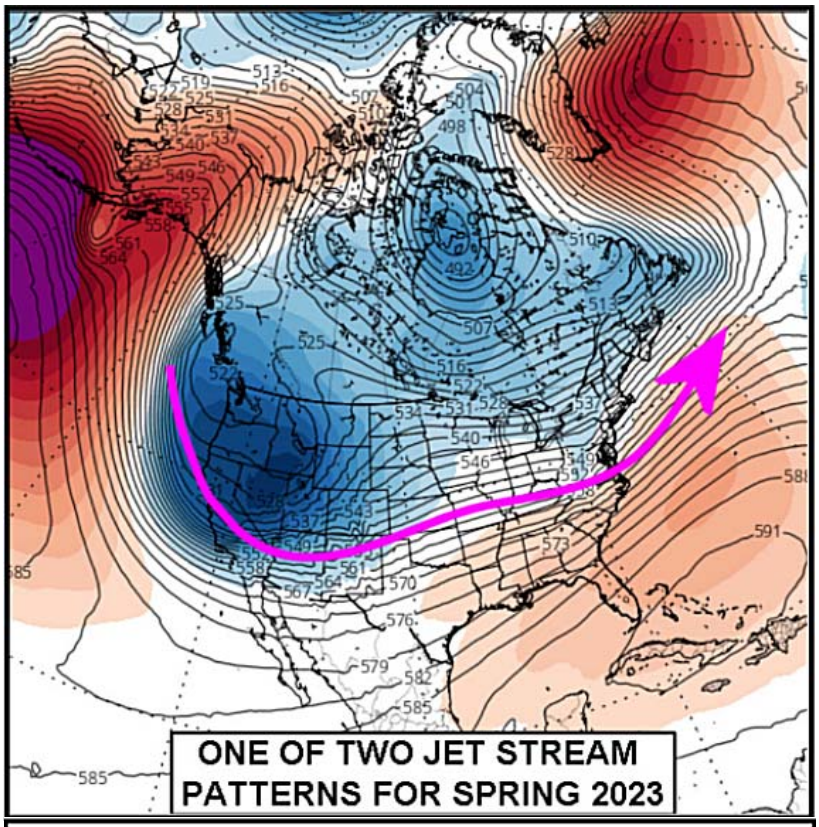
North America Weather Pattern Change Coming

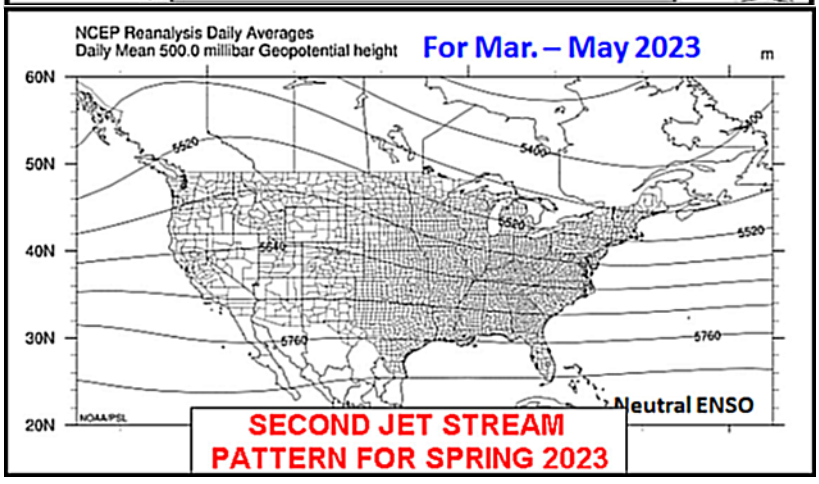
Two notable weather patterns will dominate the spring season in North America this year. The first pattern is already in control and has been partially responsible for the recent cold weather and for ensuring precipitation is minimal in Canada and greater in California and in the U.S. Midwest, Delta and Tennessee River Basin area. The pattern has also been responsible for inducing warmer than usual conditions in the southern U.S. Plains, lower Mississippi River Basin and southeastern states

A second weather pattern is expected to evolve in the second half of March and prevail through the balance of spring, although there will be some short term disruptions to the pattern. This pattern change will include a broad-based ridge of high pressure over western Canada anchored over British Columbia and Alberta where rainfall will become most limited. The upper air wind flow will become northwesterly across the remainder of the Prairies resulting in lighter than usual precipitation and a tendency for cold weather will shift eastward across the Prairies

The upper air wind flow pattern change will be of some concern because both patterns do not promote a large amount of precipitation in the Prairies. However, it is during the transitional period in which the first pattern gives way to the second that contrasting airmass temperatures and some moisture availability should support precipitation.

March precipitation was originally expected to increase across the Prairies because of this transitory period from one upper air wind flow pattern to another; however, sudden stratospheric warming occurred in late February that has delayed the pattern change. This delay in changing weather will last into the third week of March. The earliest that precipitation will increase outside of the front range region of Alberta and far southwestern Saskatchewan will now be in the third week of March.





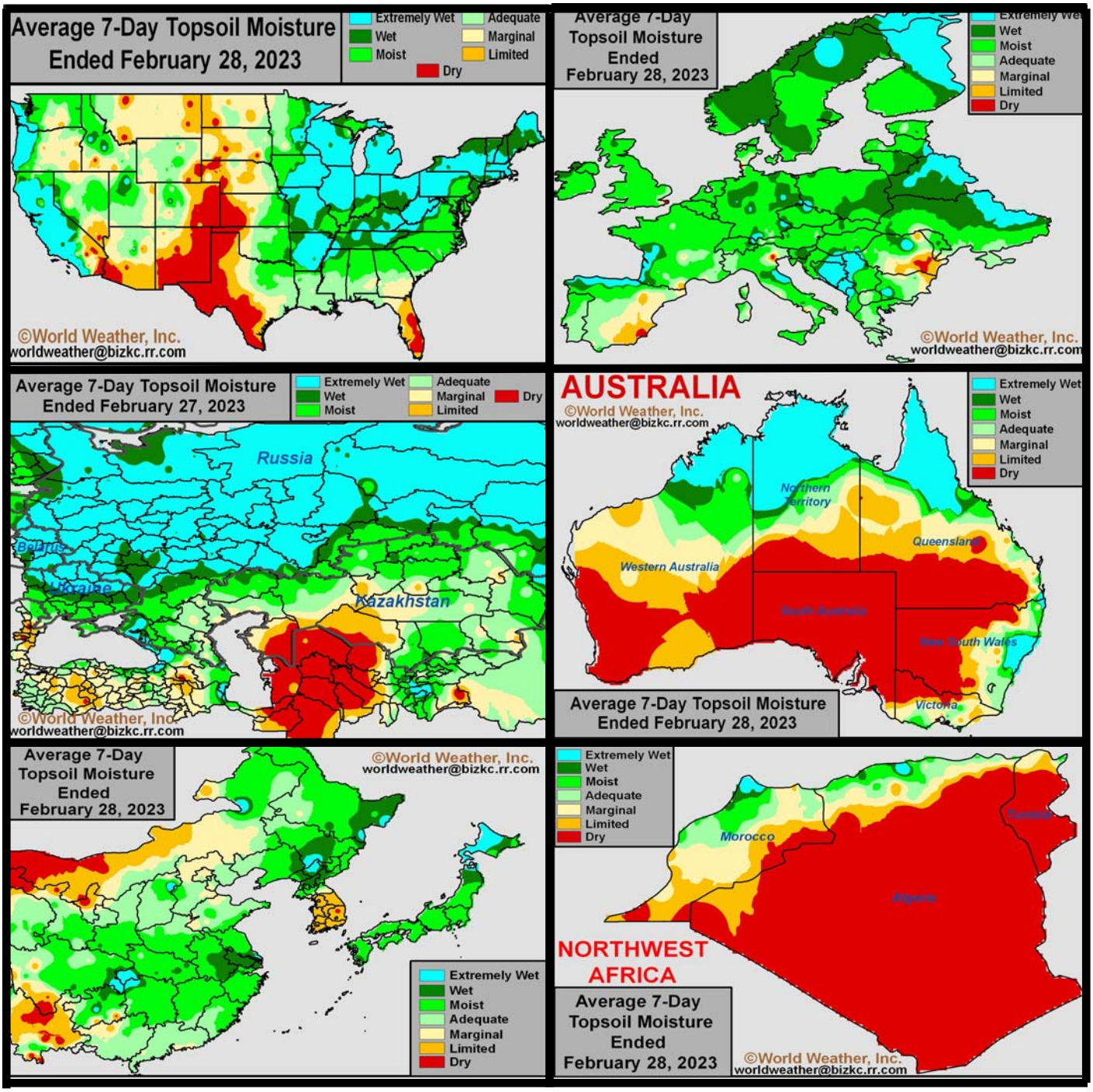
The last ten days of March and first half of April will offer the best potential for rain and snow of significance for various areas in the Prairies. It will be a critical period of time because two other changes will take place in the second half of April and May that will downplay precipitation.

The first change occurs in the second half of April and it should be a new surge of bitter cold that will drop through the eastern Prairies. This will bring back much colder temperatures and induce a short term bout of precipitation in the east. The cold will last for a week to ten days at which time precipitation will be suppressed except in western and southern Alberta.

Following that weather pattern change will be the arrival of warmer air once again. The returning heat will support another opportunity for rain, but the month of May could have trouble getting enough rain to fall in the southwestern Prairies because of some kind of pattern of dryness that repeats in both the 18-year lunar cycle and in the years of similarity to the recent multi-year La Nina event that occurred during this 22-year solar cycle while the negative phase of Pacific Decadal Oscillation (PDO) prevailed.

(Continued on Page 6)

Selected Weather Images From Around The World



U.S. soil moisture has increased across most of the Midwest, but it has been decreasing in the lower Delta, southern Alabama and southern Georgia. Drought remains a concern in southern and western Texas and areas northward through the Great Plains with hard red winter wheat areas wettest. Notice the wetter bias in California. Australia continues quite dry, although irrigated summer crops are performing well. Dryland sorghum and cotton yields in Australia are in decline. A boost in rainfall is still needed across northern Africa, although crop conditions vary greatly across the region. Tunisia and a part of northeastern Algeria need rain most urgently. China soil moisture is still rated well, but a drying trend is under way in the Yangtze River Basin where rapeseed development has begun. Wheat in China is still rated well. Europe and the CIS winter crops are still rated favorably, but there is need for more moisture in eastern Spain and the lower Danube River Basin.

Late March, Early April Precipitation To Increase

March will be cooler than usual across most of the Prairies. The only area that could end up warmer biased would be in the far west where a ridge of high pressure is expected to evolve late in the month. Temperatures near the late month ridge of high pressure could rise well above average pulling up the average temperatures so that the Peace River Region and front range area of the Rocky Mountains end the month with near to above normal temperatures.

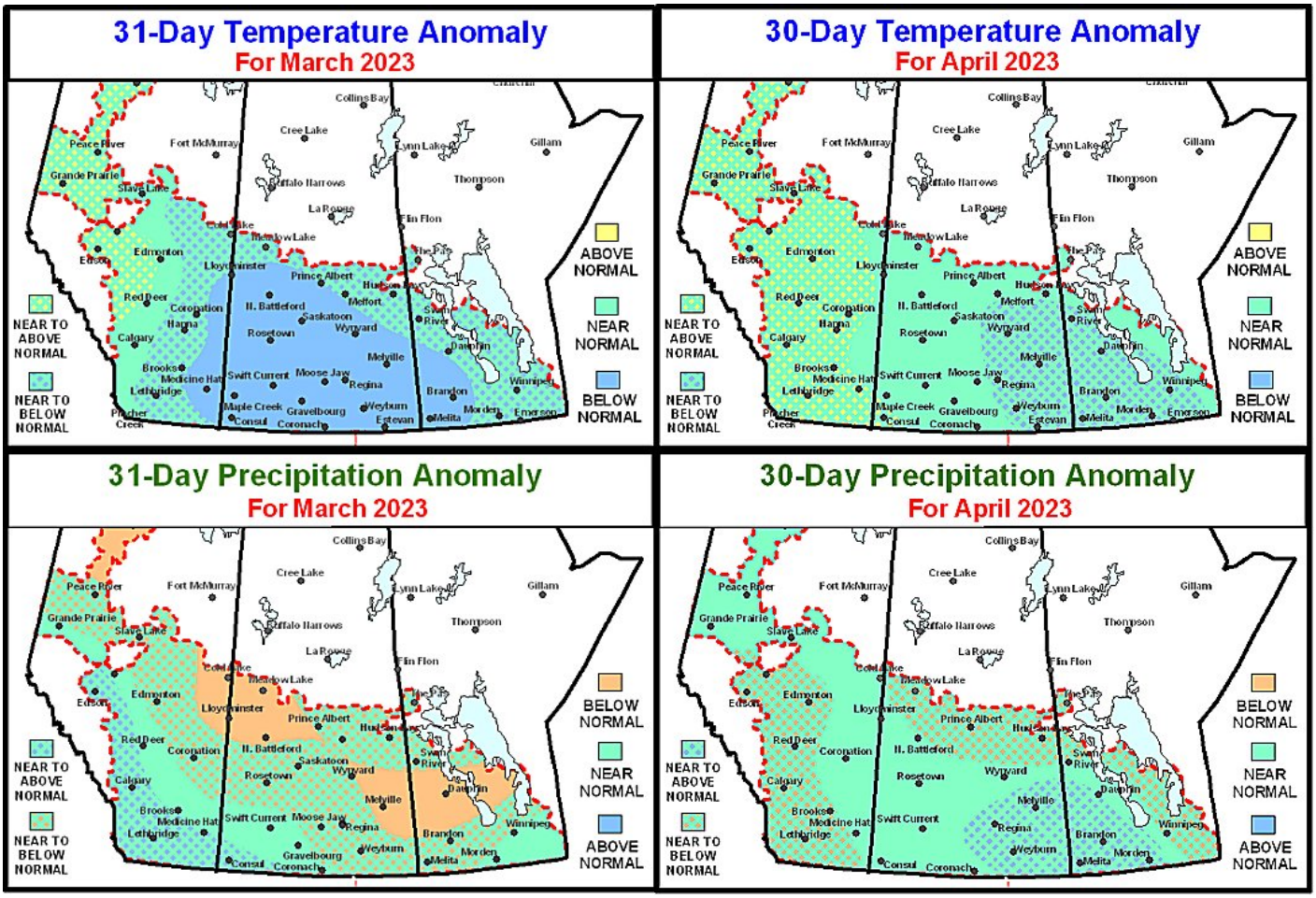
The heart of the Prairies will be colder than usual and for at least a part of the month temperatures will be well below normal. Precipitation during March will be determined by the temperatures and the high pressure ridge noted above. Precipitation will be mostly confined to the western and southern parts of Alberta during the month as upslope winds induce greater precipitation in those areas. Most other areas in the Prairies will be influenced by a series of large surface high pressure systems that will march through the region resulting in lighter than usual precipitation and temperatures that are sometimes well below normal.

Late March and the first half of April should be a notably warmer biased period of time. The transition from the colder bias of March to the warmer days of late March and early April should result in the development of rain and some snow. It will be an extremely important period of time because the precipitation that results will lift topsoil moisture enough to support planting.

There is potential for May to be drier than usual in the southwestern Prairies and if that proves to be correct then the precipitation that evolves in late March and early April will be extremely important in supporting the first round of significant planting.

The warm weather of late March and early April will be disrupted in the eastern portions of the Prairies during mid– to late April when a significant cold surge moves across the region. The returning cold air will be preceded by some needed precipitation and then followed by a period of 7 to 10 days of colder and drier than usual weather. This bout of cold will mostly impact the eastern Prairies and temperatures in the west will be near to above normal.

Some rain and snow will accompany each period of temperature change during March and April resulting in some needed support for additional planting and early season crop development.



N. America Weather Pattern Change Coming (continued from Page 3)

It may be a coincidence that two different sets of weather data covering six years of weather in the Prairies during the month of May, but below average precipitation occurred in the southwestern Prairies in each of these years. This drier bias includes much of Palliser's Triangle and the area that has already been dealing with a multi-year drought. The anomaly may or may not repeat this year, but if some significant precipitation can fall in March and/or April before the drier pattern kicks in the timing of below average precipitation in May could be nearly ideal for getting a significant amount of planting completed.

The two data sets advertising the drier May weather include the 18-year lunar cycle and the pattern that dominated 2020 through 2022 including the 22-year solar cycle, the negative PDO and the multi-year La Nina event. World Weather looked at the years 1969, 2005 and 1987 from the 18-year cycle data and the years 2001, 1957 and 1976 from the multi-year La Nina event. The data is displayed on this page. Notice the persistence of below average precipitation on all six percentage of normal rainfall charts for the month of May.

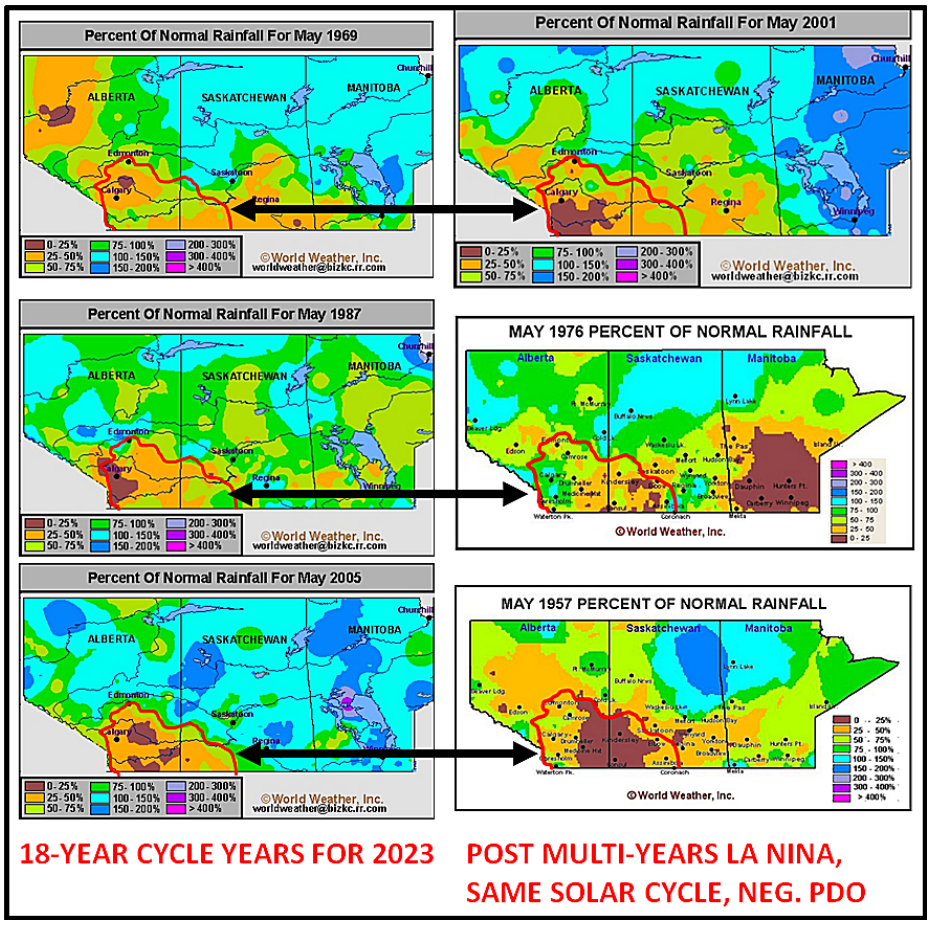
There was also an association between northern California excessive December and January precipitation events and below average precipitation in southwestern Canada during the month of May. For whatever reason, there seems to be a strong association with below normal precipitation during that month. Statistically, the data suggests there is a high potential for the below average precipitation bias to verify again. However, the contrarian position of the data suggests the region is long overdue for a break from the pattern and some would suggest that there is reason to expect a surprise change in this pattern this year.

A change toward wetter May weather might be welcome, but for now we must follow the trends and anticipate a drier biased period during that month. As mentioned previously, though, a drier May could be a very good event for getting aggressive in the fields if there has already been some significant precipitation in previous weeks. There is potential for that scenario and many producers will put a lot of faith into that relationship and hope for the best.

Once the month of May ends, the summer months progressively become more favored to see rain especially in the central and southern parts of the Prairies. World Weather, Inc. has chosen to be very conservative with its rainfall forecast because of the prolonged drought in the southwest, but there is reason to be hopeful for change.

Losing La Nina is reason enough to anticipate some change from the multi-year drought. However, remember that some of the crop region in the southwestern Prairies was dry long before La Nina came on the scene suggesting there are other reasons for the start of drought.

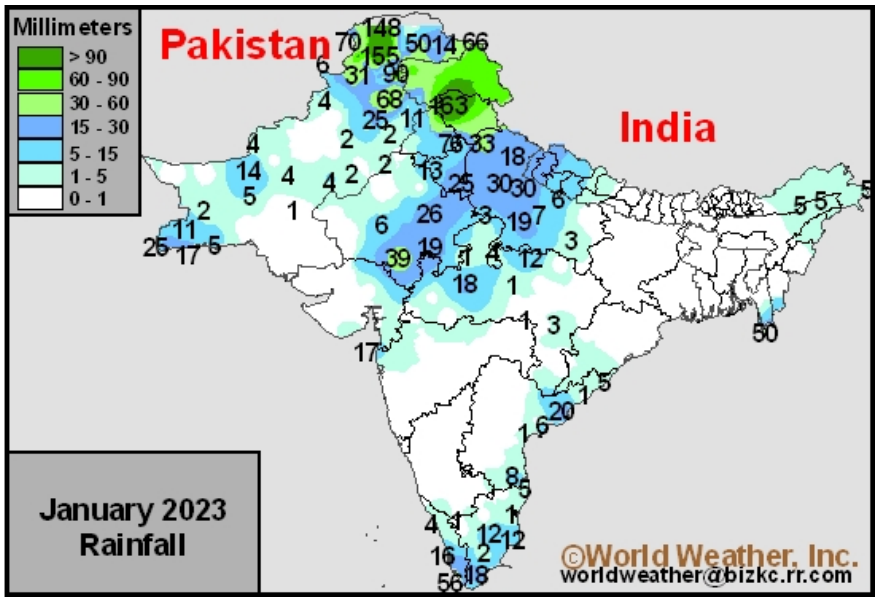
Losing La Nina is one good excuse for a pattern change, but there are other reasons to anticipate change this summer. There seems to be potential for cool air to be present in the western and northern parts of Canada this summer and that alone should help set up contrasting air mass conditions great enough to induce rain. The negative PDO pattern should also help place a trough of low pressure along the U.S. Pacific Coast and ridge of high pressure in the central United States and that, too, will help induce Montana low pressure centers and send them off to the east northeast to help bring moisture to the Prairies. Overall, once we get past the spring there is reason to expect a boost in summer rainfall.



India Dryness To Result In Smaller Winter Crop

Rainfall was limited for much of India during February. Most of the nation's unirrigated winter crops reproduced under fair to poor conditions resulting in a threat of lower yields. Temperatures during February were also warmer than usual and that, too, raised crop stress especially for the unirrigated crops further raising the potential for lower yields.

A large portion of India was dry in February. However, portions of the Eastern States received 1.26 to 2.95 inches of rain for the month. Many areas in Tamil Nadu and Kerala received 0.12 to 0.71 inch of rain with a local amount of 4.29 inches along the eastern Tamil Nadu coastline. Jammu and Kashmir received up to 1.34 inches of rain while Himachal Pradesh and northern Uttar Pradesh received 0.20 to 0.47 inch of rain.



Moisture shortages remain prevalent across India outside the areas in extreme eastern and northern India that reported rain in February. Dryness has intensified over the winter due to drier than normal conditions. Western disturbances have failed to bring rain to much of the country since November, allowing the ground to gradually firm.

Rabi wheat, rapeseed, mustard, and other crops normally reproduce in February and fill in March. Irrigated crops, which in 2019 was reported to be about 36% of the nation's total crop area, likely reproduced under generally favorably conditions. However, the rain-fed winter crops may have reproduced under poor conditions because of dryness.

Production potentials are already slight lower than normal this season due to the lack of precipitation over the winter. The main concern in the coming weeks will be whether an early season heatwave evolves like that of 2022. An early season bout of excessive heat could further stress crops and cut overall production potentials. Last year's heat wave occurred in February and March setting many records, but the warm weather this year has not been nearly as extreme, though rainfall was lighter than that of 2022.

The main production areas in India will remain dry or mostly dry during the coming week. However, Jammu and Kashmir and portions of Himachal Pradesh will still see periods of rain with totals ranging from 0.50 to 2.00 inches and locally greater amounts by next Wednesday morning. The southern tip of Tamil Nadu and Kerala will also have a few opportunities for rain with totals ranging from 0.10 to 0.75 inch. A few light showers will also be possible in Maharashtra and neighboring areas toward the middle of next week as well.

Temperatures will trend near to above normal in much of the country. Daytime highs will peak in the upper 20s and 30s Celsius with pockets in the north and east only warming to the lower 20s. Pockets in western India will occasionally warm above 38C as well, mostly toward the middle of next week.

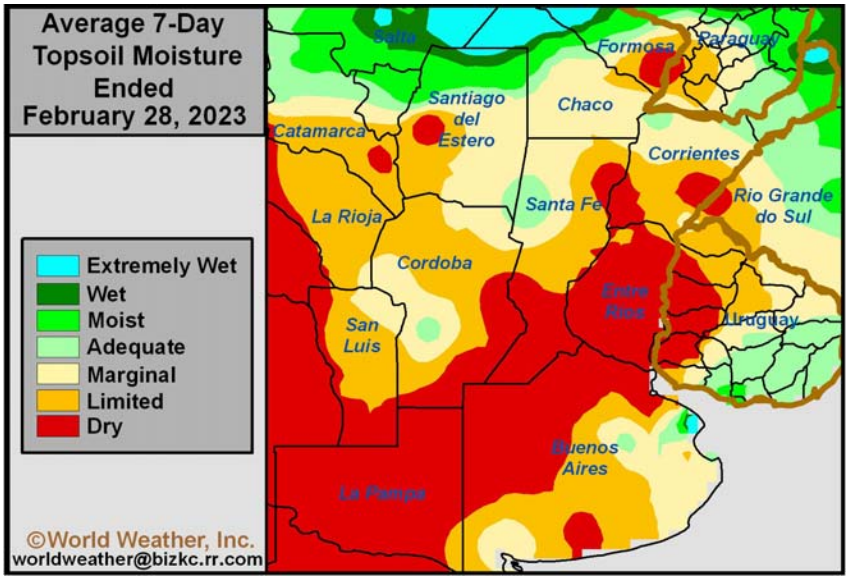
Additional drying is slated for much of India through the middle of next week. Winter crop reproduction and filling conditions will further deteriorate for most locations resulting in lower yields in unirrigated fields.

There is growing confidence a western disturbance may bring rain to portions of India March 9 – 15. While the rain will be too late in the season to significantly improve overall winter crop potentials, the rain and cloudiness may keep temperatures from becoming excessively hot.

Even with the potential for rain and milder temperatures during the second week of the outlook, winter crop production potentials will remain below average for most unirrigated crops. Irrigated crops will perform more normally.

Argentina Drought May Not Break For A While

Drought refuses to break in Argentina. Relief that occurred in late January has not been followed by enough rain to seriously bolster soil moisture and dryness has been an ongoing problem even though the hottest weather of summer has apparently abated and there have been a few bouts of light precipitation. The pattern is quite similar to that of 2009 when drought relief came in early to mid-January, only to be followed by more drought. The breakdown of drought in 2009 did not come readily and the Vegetative Health Index remained extremely stressed through much of the autumn season. In the meantime, the only drought relief in the next week to ten days will be in northern parts of the nation later this week into next week.



Pockets in Buenos Aires, central Argentina, and northern Argentina have adequate to marginally adequate soil moisture due to spotty rainfall in recent weeks. However, a large portion of Argentina's main production area has short to critically short soil moisture.

Vegetative health was highly variable across Argentina as of February 22. There were several areas in Buenos Aires, northern La Pampa, Cordoba, and San Luis that received enough rain to support generally favorable growth recently. However, the rain was not widespread or significant enough to support ideal conditions for very long. There are still several areas with unfavorable vegetative health conditions and that situation cannot improve without a generalized soaking of rain.

Vegetative health in other production areas of Argentina is generally less than favorable to poor.

Soybean, corn, and other coarse grain and oilseed development conditions remained poor during the past week. Significant production losses are still expected this season in soybean, corn, sunseed, cotton and sorghum production. Peanuts may be in the best condition, despite dryness recently. A good shot of rain is needed for the late-planted crops, though any rain that falls will come too late in the season to significantly improve overall production potentials.

A similar weather pattern to that which occurred last week is expected in this coming week with little precipitation of significance likely except in the far north of Argentina where cotton, dry bean, sugarcane, citrus and some minor grain and oilseed crops will benefit. Rain that falls in central Argentina will not be enough to seriously break drought conditions, Daytime high temperatures will peak in the 90s and slightly above 100 degrees Fahrenheit for several areas and the potential for significant crop stress will increase. Production potentials will either remain mostly unchanged or may be further reduced.

Apparently Argentina has experienced prolonged droughts of significance in the past and despite the tendency to blame this prolonged serious drought on climate change there is evidence that this pattern – like that of droughts in the western United States and the Great Plains are cyclical and have a history of producing significant economic hardship on the farming community first and eventually on the financial industry as well.

World Weather, Inc. notes that the severe drought of 2008-09 never fully broke down to the point of seeing improved vegetative growth as shown through the Vegetative Health Index (VHI) until late in the autumn season. Some bouts of rain were noted, but a serious change in the health of vegetation failed to materialize until May. That does not mean the same thing will happen this year, but it is worth noting that in the 2008-09 drought and in the drought of 1975-76 the drought occurred after a multi-year La Nina event just like this year. That does not mean drought this year will last through May, but it does suggest the breakdown may be slow in com-

Argentina Drought Slow To Break (continued from page 8)

ing.

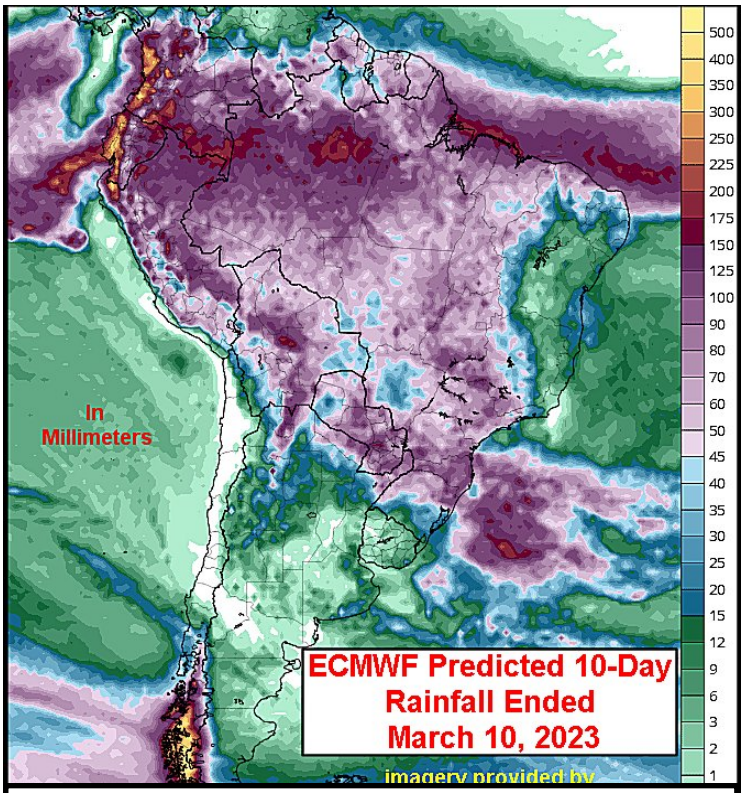
Normally, severe droughts that occur in the middle latitudes of the Northern and Southern Hemisphere during the middle of summer always have a tough time breaking down until the seasons change. March offers the first opportunity for the jet stream to move northward enough to bring rain into Argentina, but the same statement can be said of the 2008-09 drought and it did not break until May. World Weather, Inc. does not believe this drought will last that long, but there is certainly no sign of a breakdown in the next two weeks.

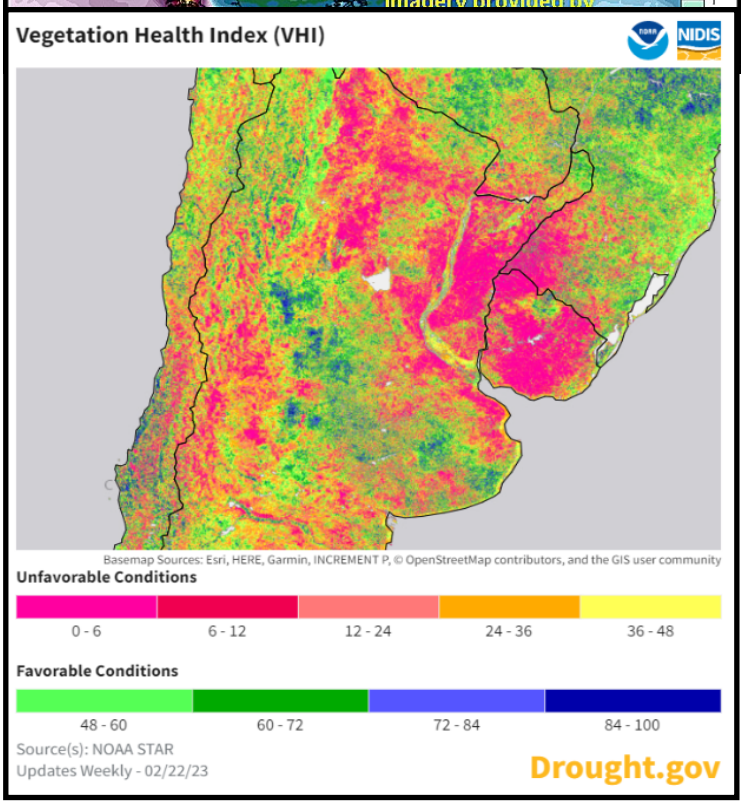
WEATHER OUTLOOK

Precipitation will be variable across Argentina over the coming week. A weather disturbance will promote scattered showers and thunderstorms tonight and Wednesday, primarily in northern and central Argentina. Light showers will linger in northern and eastern Argentina Thursday. Portions of central and southern Argentina will then receive mostly light rain Friday and Saturday. Another disturbance may then promote scattered showers later this weekend. Northern Argentina will receive 0.75 to 3.00 inches of rain through early next week while central Argentina receives 0.25 to 1.25 inches. Southern Argentina will not receive enough rain to counter evaporation or impact long-term soil conditions. A similar weather pattern is expected March 7 – 13.

Temperatures will often trend above normal for Argentina this week. Daytime highs will peak to the upper 80s and 90s most days with pockets in central and northern Argentina often warming above 100 degrees. Low temperatures will be in the 50s and 60s with portions of southern Argentina cooling to the 40s at times.

Net drying is slated for much of central and southern Argentina during the next week to ten days. Any rain that falls will briefly lower drying rates, though the warm daytime temperatures will promote aggressive drying between rain events. Late-season development conditions will remain less than favorable to poor for the main coarse grain and oilseed areas. Production potentials may be slightly reduced due to the threat for hot daytime temperatures promoting significant crop stress.

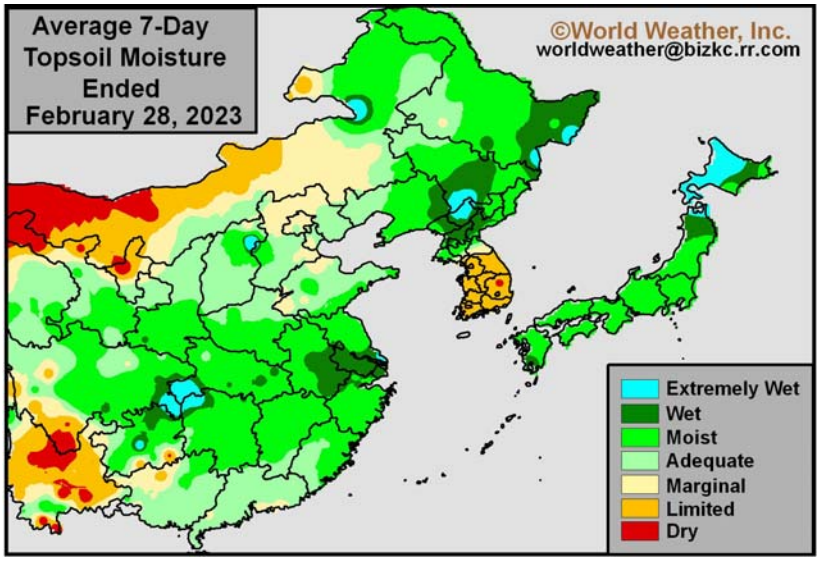




China's Rapeseed, Wheat Prospects Remain Good

China's main winter wheat and rapeseed areas received enough precipitation in February to keep soil moisture at adequate levels. Early-season development conditions will be favorable in the Yangtze River Basin, although timely rain will be needed later this month to maintain good soil moisture. Southern sections of winter wheat areas will soon warm enough to support new growth, but probably not for at least another couple of weeks. Periodic rainfall is slated for the Yangtze River Basin during the next two weeks while the North China Plain is drier biased.

Soil moisture is rated adequately in a large portion of China. However, many areas in Yunnan and southwestern Sichuan have a shortage of moisture. Pockets in central Inner Mongolia also have marginally adequate moisture. Portions of Jilin, Heilongjiang, and Inner Mongolia still have snow on the ground as of February 28. Most other production areas were snow-free.



Winter rapeseed prospects remain mostly favorable across the Yangtze River Basin and neighboring production areas. There was ample precipitation in February to keep soil moisture rated favorably as crops began developing more aggressively. The main concern is the growing area of dryness in Yunnan, which may promote sluggish development in the coming weeks. A good soaking of rain will be needed to improve crop prospects for the region. Overall production potentials remain favorable.

Winter wheat prospects are also favorable for the North China Plain and neighboring areas. The region has seen periods of precipitation over the winter that as kept the ground from drying significantly. Development should get off a good start in the coming weeks once seasonal warming occurs.

Early-season fieldwork will expand across southern China in coming weeks. Yunnan will not only need to see more frequent rainfall for the winter rapeseed, but to also improve early-season corn planting prospects.

Areas near and south of the Yangtze River will see a mix of precipitation and sunshine through the middle of next week. Sichuan, Guizhou, northern Yunnan, and western Hubei will see the most frequent rainfall with totals ranging from 0.50 to 2.00 inches and locally more by next Wednesday morning. Other locations will receive 0.10 to 0.50 inch of rain with drier pockets in east-central China and along the southern coastline. A similar weather pattern is expected March 9 – 15. The temperature profile will trend near to above normal during this time. Daytime highs will often peak to the 60s and 70s with portions of the Yangtze River Basin only warming to the 50s at times. Nighttime lows will be in the 40s and 50s in southern China and the 30s and 40s with pockets in the 50s in the Yangtze River Basin.

Soil temperatures will slowly increase in the coming weeks near and south of the Yangtze River. Winter rapeseed will continue to warm and should see accelerated crop development soon. The main production areas will have enough moisture to support aggressive growth, though some of the crop areas will start to dry down due to the warmer daytime temperatures. Timely rain will be needed later in March to maintain a good environment for the crops. Fieldwork and early-season spring planting of corn, rice and other crops will advance swiftly in southern China due to the lack of rain. However, the need for rain will increase later this month to support or maintain favorable establishment conditions.

The North China Plain and central Yellow River Basin will be drier biased through the middle of next week and again March 9 – 15. Any precipitation that occurs will either be lost to evaporation or too light to impact long-term soil conditions. Temperatures will trend warmer than normal which may eventually bring wheat out of dormancy in southern production areas. Initial wheat development should advance well due to favorable soil moisture and no winterkill