PRAIRIE WIND TRAJECTORY AND CEREAL RUST RISK REPORT for May 20-26, 2024

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Agriculture and Agri-Food Canada (AAFC) and Environment and Climate Change Canada (ECCC) have been working together to study the potential of trajectories for monitoring insect movements since the late 1990s. Trajectory models are used to deliver an early-warning system for the origin and destination of migratory invasive species, including plant pathogens. Plant pathologists have shown that trajectories can assist with the prediction of plant disease infestations. We receive two types of model output from ECCC: reverse trajectories and forward trajectories.

'Reverse trajectories' refer to air currents that are tracked back in time from specified Canadian locations over a five-day period prior to their arrival date. If plant pathogens are present in the air currents that originate from these southern locations, they may be deposited on the Prairies at sites along the trajectory, depending on the local weather conditions at the time that the trajectories pass over our area (e.g. rain showers, etc.). Reverse trajectories are the best available estimate of the ''true'' 3D wind fields at a specific point. They are based on observations, satellite and radiosonde data.

Disclaimer

Information related to trajectory events based on forecast and diagnostic wind fields and cereal rust risk is experimental, and is **OFFERED TO THE PUBLIC FOR INFORMATIONAL PURPOSES ONLY**. Agriculture and Agri-Food Canada, Environment Canada, and their employees assume no liability from the use of this information.

1. RUST DEVELOPMENT IN SOURCE LOCATIONS

a. Pacific Northwest (PNW)

i. Earlier PCDMN cereal rust risk updates outlined previous stripe rust risk forecasts and symptom observations in the PNW by Dr. X Chen from USDA ARS/Washington State University (https://prairiecropdisease.blogspot.com/2024/04/continuing-signs-of-stripe-rust-in-usa.html, https://prairiecropdisease.blogspot.com/2024/04/update-on-usa-cereal-rust-situation-and.html, https://prairiecropdisease.blogspot.com/2024/05/2024-cereal-rust-risk-report-may-7-13.html; Prairie Crop Disease Monitoring Network: 2024 Cereal Rust Risk Report (May 14-20, 2024).

ii. Reports from April 2024 from Dr. Chen, USDA-ARS and Washington State University (WSU), Dr. T. Murray (WSU) and Dr. C. Hagerty CBARC, Oregon State University, indicated continued development of stripe rust in research plots and commercial fields (https://smallgrains.wsu.edu/stripe-rust-24/; https://striperust.wsu.edu/2024/04/28/stripe-rust-update-april-26-2024/; https://twitter.com/WSUWheatDoc/status/1786478714785501400). Incidence levels in commercial fields were generally low, although Dr. Chen did observe a hot spot of elevated severity in a commercial field. Dr. Chen cautions that forecast cool weather and rainfall in late April and early May could promote further development of stripe rust.

iii. Reports and news features from late April and into May indicated a risk of significant levels of stripe rust in the PNW (https://610kona.com/ixp/1144/p/stripe-rust-winter-wheat-wa/; https://wagrains.org/articles/stripe-rust-is-back-for-2024-crop/).

iv. A report from May 13, 2024 also suggests significant concerns regarding stripe rust in the Washington State (https://pnwag.net/stripe-rust-winter-wheat-wa/).

v. The latest USDA Cereal Rust Bulletin indicates the continued appearance of stripe rust in PNW (#2, May 15, 2024, Dr. O. Fajolu, USDA, Cereal Disease Laboratory, St. Paul, MN,

https://www.ars.usda.gov/midwest-area/stpaul/cereal-disease-lab/docs/cereal-rust-bulletins/cereal-rust-bulletins/).

vi. **As of May 28, 2024, the early occurrence of stripe rust symptoms suggests there is an emerging risk that the PNW, which can be an important source of stripe rust inoculum for Prairie wheat growers in 2024. Further rust development in commercial PNW winter wheat fields could substantially increase this risk.**

vii. Currently there are no reports of stripe rust symptoms in Prairie commercial winter or spring wheat crops although symptoms have been reported at AAFC Lethbridge by Dr. R. Aboukhaddour, AAFC Lethbridge (https://x.com/ReemWheat/status/1791567749489312080). Previously, early development of stripe rust in disease nurseries at Abbotsford and Creston, BC was reported by Dr. G. Brar, U of Alberta, formerly of UBC, and likely reflect overwintering on winter wheat breeding lines (https://x.com/gurcharn_brar/status/1779910374051209644).

b. **Texas/Oklahoma**

i. Earlier PCDMN cereal rust risk updates outlined previous observations and concerns regarding stripe rust in Texas and Oklahoma as well as reports of leaf and stem rust in wheat and crown rust in oat (https://prairiecropdisease.blogspot.com/2024/04/continuing-signs-of-stripe-rust-in-usa.html, https://prairiecropdisease.blogspot.com/2024/04/update-on-usa-cereal-rust-situation-and.html, https://prairiecropdisease.blogspot.com/2024/05/2024-cereal-rust-risk-report-may-7-13.html; Prairie Crop Disease Monitoring Network: 2024 Cereal Rust Risk Report (May 14-20, 2024).

ii. Stripe rust continues to be a concern in Oklahoma, although a significant number of winter wheat acres have already been sprayed with fungicide (Dr. A De Oliveira Silva, Extension Specialist for Small Grains, OSU quoted in https://www.farmprogress.com/wheat/oklahoma-wheat-much-improved-in-2024).

iii. Texas and Oklahoma crops are moving towards maturity and harvest. In Texas as of May 26, 2024 21% of the winter heat crop has been harvested, while in Oklahoma 12% of the winter wheat crop has been harvested (https://quickstats.nass.usda.gov/results/218B6322-CB54-3AE4-899B-2B4BABAE1193; https://quickstats.nass.usda.gov/results/9FBE6ADA-AB95-38E8-8B75-FF059977266E). As Texas and Oklahoma winter wheat crops move towards maturity and harvest, they will no longer represent a source of rust inoculum for the Prairie region.

iv. **As of May 28, 2024, there is a low to moderate risk associated with the Texas/Oklahoma region being a significant source of stripe rust inoculum for dispersal into the Prairie region of Canada.**

c. **Kansas/Nebraska**

i. Earlier PCDMN cereal rust risk updates outlined previous observations and concerns regarding rusts in Kansas and Nebraska winter wheat crops (https://prairiecropdisease.blogspot.com/2024/04/continuing-signs-of-stripe-rust-in-usa.html, https://prairiecropdisease.blogspot.com/2024/04/update-on-usa-cereal-rust-situation-and.html, https://prairiecropdisease.blogspot.com/2024/05/2024-cereal-rust-risk-report-may-7-13.html; https://prairiecropdisease.blogspot.com/2024/05/2024-cereal-rust-risk-report-may-14-20.html).

ii. Many Kansas counties have low intensities of stripe rust, although some central regions have had more significant levels (Dr. E DeWolf and K. A. Onofre, KSU, Update on Rust Diseases from Kansas, Cereal Rust Survey <CEREAL-RUST-SURVEY@LISTS.UMN.EDU>). Figure 1 shows the most recent distribution of stripe rust in Kansas counties (https://wheat.agpestmonitor.org/stripe-rust/ (as of May 22, 2024). In addition, to stripe rust, leaf and stem rust have also been reported in Kansas winter wheat fields, but mainly in four counties in south central Kansas, while stem rust has also been reported in variety trials in north central Kansas. Dr. De Wolf comments that stem rust observations are earlier than usual.

iii. Dr. M Guttieri, KSU, reported on May 25, 2024 that significant levels of stripe rust were being observed in a KSU FHB nursery in Kansas, while M. Dozler, Syngenta reported stripe rust was

common in a field in NW KS (https://x.com/Wheat_MaryG/status/1794501480185266260; https://x.com/MarkDozler/status/1794331278919012435).

iv. USDA crop progress reports from May 26, 2026 indicate only 2% of the Kansas winter wheat crop is mature, so cereal rusts could still be active in this region (https://quickstats.nass.usda.gov/results/7697AE4A-A089-347D-BD9E-C773202FAA83).

v. The latest USDA Cereal Rust Bulletin indicates the continued appearance of stripe rust in the Texas to Nebraska corridor, while there have also been reports of wheat leaf and stem rust, and oat stem and crown rust (#2, May 15, 2024, Dr. O. Fajolu, USDA, Cereal Disease Laboratory, St. Paul, MN, https://www.ars.usda.gov/midwest-area/stpaul/cereal-disease-lab/docs/cereal-rust-bulletins/cereal-rust-bulletins/).

vi. In their May 23, 2024 update Dr. S. Wegulo and colleagues report further increases in the detection of stripe rust with reports of 19 counties being affected by low intensities and mainly in southern regions (Figure 2, https://cropwatch.unl.edu/2024/wheat-disease-update-may-23-2024). The most recent observations were made in research trials at Lincoln and Mead, Nebraska with stripe rust affecting most of the upper canopy of susceptible material (https://cropwatch.unl.edu/2024/wheat-disease-update-may-23-2024) .

vii. As of May 24, 2024, leaf rust symptoms have not been observed in Nebraska (Figure 3, https://cropwatch.unl.edu/2024/wheat-disease-update-may-23-2024).

viii. **As of May 28, 2024, there is a low-moderate risk associated with the Kansas/Nebraska region being a significant source of stripe and leaf rust inoculum for dispersal into the Prairie region of Canada.** If cooler, wetter weather occurs over the next 7-21 days the risk of stripe rust inoculum from Nebraska and neighbouring states could increase substantially.

ix. Of interest are the numerous reports of stripe rust in southern Ontario winter wheat fields, where inoculum has likely arrived from neighbouring states south and west of Ontario, e.g. Louisiana through to Michigan and northwest New York State (Figure 1, https://www.canr.msu.edu/news/wheat-stripe-rust-outbreak-and-fusarium-head-scab-risk-prediction; https://www.topcropmanager.com/omafra-stripe-rust-management/; https://twitter.com/realagriculture/status/1791187946286002511; https://www.realagriculture.com/2024/05/identifying-and-managing-stripe-rust-in-winter-wheat/?utm_source=twitter&utm_campaign=May%2026%2C%202024&utm_medium=social; https://x.com/FarmsMarketing/status/1794088836491788406);

d. **The Dakotas, Wisconsin, and Minnesota**

i. On May 27, 2024, Dr. M. Shires reported the detection of stripe rust in multiple areas in Brookings County, South Dakota, while the SDSU Winter Wheat Breeding program reported stripe rust in a variety trial in the same county (https://x.com/maddishires/status/1795078948113563786; https://x.com/WheatInnovation/status/1794915400012206296).

ii. During the week of May 20-24, 2024, Dr. D.L. Smith, University of Wisconsin-Madison, reported stripe rust in two Wisconsin counties (Figure 1 [note it appears that not all jurisdictions in the USA are using the Wheat AgPestMonitor reporting system] https://badgercropdoc.com/2024/05/24/wisconsin-winter-wheat-disease-update-may-24-2024/).

2. Reverse trajectories (RT)

a. Since April 1, 2024, the majority of reverse trajectories that have crossed the prairies continue to originate from the Pacific Northwest (Idaho, Oregon and Washington). This past week (May 20-26, 2024) many reverse trajectories were observed to originate over northern Canada and the Pacific, before crossing the prairies (Figure 4).

b. **Pacific Northwest (Washington, Oregon, Idaho)** – Since April 1, 2024, the greatest number of reverse trajectories, crossing the prairies, have originated from the Pacific Northwest (Figures 5 and 6). These trajectories have passed over southern Alberta, Saskatchewan and southwestern Manitoba. For the week of May 20-26, there have been 24 reverse trajectories that passed through the prairie region (Table 1).

   i. **For the week of May 20-26, 2024, there is relatively low risk associated with the PNW region being a significant source of wind trajectories for dispersal of the stripe rust pathogen into the Prairie region of Canada. However, Arborg, MB and Lethrbridge, AB had three and four trajectories, respectively that previously passed over the PNW region.**

c. **Oklahoma and Texas** – Since April 1, 94 reverse trajectories, originating over Oklahoma and Texas were reported to cross the prairies (Figures 7 and 8). These trajectories primarily crossed southcentral and southeastern Manitoba (Figures 7 and 8). However, from May 20-26, 2024, only one trajectory from the TX/OK region passed over a Prairie location, i.e. Dauphin, MB (Table 2).
   i. **For the week of May 20-26, 2024, there is low risk associated with the TX/OK region being a significant source of wind trajectories for dispersal of the stripe rust pathogen into the Prairie region of Canada.**

d. **Nebraska and Kansas –** A total of 140 reverse trajectories, originating from Kansas and Nebraska have crossed the prairies, primarily Manitoba and Saskatchewan (April 1 – May 26, 2024) (Figures 9 and 10). Wind dispersal models predicted that reverse trajectories passed over a relatively small number of Manitoba locations on May 25 and 26 (Table 3).
   i. **For the week of May 20-26, 2024, there is low risk associated with the KS/NE region being a significant source of wind trajectories for dispersal of the stripe rust pathogen into the Prairie region of Canada.**

3. Prairie Crop Development, Weather Conditions, and Overwintering of Rust

a. Winter wheat – Winter wheat continues growth in May with crops progressing into tillering and in some cases moving into the stem elongation growth stage (https://www.gov.mb.ca/agriculture/crops/seasonal-reports/crop-report-archive/pubs/crop-report-2024-05-21.pdf).

b. Spring wheat – Across the prairie region the majority of spring wheat has been planted, although some fields still remain to be planted depending on the province and region (https://open.alberta.ca/dataset/a8632ff6-a50d-496c-8dc6-7cee941b5977/resource/24c5c510-b8ce-4e2e-b136-f0695f3a3893/download/agi-itrb-alberta-crop-report-2024-05-21.pdf; https://publications.saskatchewan.ca/api/v1/products/123595/formats/144019/download; https://www.gov.mb.ca/agriculture/crops/seasonal-reports/crop-report-archive/pubs/crop-report-2024-05-21.pdf).

c. **Weather synopsis** – Prairie temperatures and rainfall amounts continue to be above average for the 2024 growing season. This past week (May 20-26, 2024) temperatures were cooler than normal. The average temperature across the prairies was 9.2 °C and was 1.9 °C cooler than climate normal values (Figure 11). Warmest temperatures were observed across the Peace River region and regions south of the Trans-Canada highway.

d. Many prairie locations had accumulated rain amounts that were greater than 5 mm. Average cumulative seven day rainfall was 17.6 mm. The Peace River region continues to have the lowest weekly rainfall for the prairies (Figure 12). Many Manitoba locations have had 7 day rainfall amounts that were greater than 30 mm.

e. The average 30 day temperature (April 27 - May 26, 2024) was 9.5 °C and was marginally warmer than the long term average temperature. Warmest temperatures were observed south of an area extending from Winnipeg to Saskatoon and southwest to Lethbridge (Figure 13). Most of the prairies have reported 30 day rainfall amounts were normal to above normal. Average cumulative rainfall (mm) over the past 30 days was 79 mm and was 232% of climate normal values. The Peace River region continues to report lowest rainfall totals (Figure 14)

f. Since April 1, the 2024 growing season has been 1 °C warmer than average. Compared to climate normals, average growing season temperatures were cooler than normal across most of Alberta and warmer than normal for Manitoba and Saskatchewan (Figure 15). Warmest average temperatures were observed across Saskatchewan and Manitoba (Figure 16).

g. Growing season rainfall has been above normal across most of the prairies, although large areas in central to eastern Saskatchewan, the Highway 2 corridor in Alberta and northwest and west of Edmonton and the Peace region are drier. Rain amounts in wetter regions have been up to 212% of climate normal, while in drier regions growing season rainfall has been 50-100% of normal (Figure 17). Highest cumulative growing season rainfall has been greatest for most of Manitoba and southern Alberta (Figure 18).
h. Currently, there are no reports of early season stripe rust development in winter wheat, which would suggest potential overwintering, especially of stripe rust (personal communication: S. Rehman, R. Aboukhaddour, AAFC Lethbridge; and H.R. Kutcher, U. of S.).

4. Overall, Rust Risk Assessment and Need For In-Crop Scouting

a. **Pacific Northwest** – There were low numbers of reverse wind trajectories that passed over the PNW region and into the Prairies, while stripe rust development is continuing in the PNW. Prairie winter wheat crops are progressing into the tillering and stem elongation stages, while much of the spring wheat crop has now been seeded or will be seeded soon**. Overall, as of May 26, 2024, the risk of stripe rust appearance from the PNW is relatively low and scouting for this disease in the Prairie region is generally not urgent (Figure 19).**
b. **Texas-Oklahoma corridor** – There was only one reverse wind trajectory that passed over the TX/OK region and into the Prairies from May 20-26, 2024, while stripe and leaf rust development are continuing, although levels appear to be generally low, especially in commercial winter wheat fields in the TX/OK region. As Texas and Kansas winter wheat crops move towards maturity and harvest, they will no longer represent a source of rust inoculum for the Prairie region. Prairie winter wheat crops are progressing into the tillering and stem elongation stages, while much of the spring wheat crop has now been seeded or will be soon. **Overall, as of May 26, 2024, the risk of stem, leaf, stripe, and crown rust appearance from the Texas-Oklahoma corridor is relatively low and scouting for these diseases in the Prairie region is not urgent (Figure 20).**
c. **Kansas-Nebraska corridor** – There was a small number of reverse wind trajectories that passed over the KS/NE region and into the Prairies from May 20-26, 2024, while stripe and leaf rust (Kansas) development are continuing in commercial winter wheat fields in this region. Prairie winter wheat crops are moving into the tillering to stem elongation stages, while much of the spring wheat crop has now been seeded or will be soon. **Overall, as of May 26, 2024, the risk of stem, leaf, stripe, and crown rust appearance from the Kansas-Nebraska corridor is relatively low and scouting for these diseases in the Prairies is not urgent (Figure 21).**
d. The early and widespread appearance of stripe rust in the PNW, TX/OK and KS/NE regions is still concerning, while the recent stripe rust observations from South Dakota and Wisconsin bring the stripe rust issue ever closer to the Prairies, especially the central to eastern region. Over the next 2-4 weeks if favourable weather conditions (especially more rainfall) occur in these source US regions, further rust development could occur. This would result in more rust spores being available to be blown into the Prairie region, as well as more northerly rust development into the Dakotas and Minnesota/Wisconsin. Currently, Prairie winter wheat fields are most at risk, but fortunately most current winter wheat varieties have intermediate to high levels of resistance, although AC Radiant, CDC Buteo, AAC Elevate, Broadview, and CDC Falcon are rated as susceptible (https://www.seed.ab.ca/variety-data/cereals/; https://saskseed.ca/wp-content/uploads/2020/12/2024-Varieties-of-Grain-Crops.pdf; https://www.seedmb.ca/pdf-editions-and-separate-section-pdfs/). In terms of spring wheat (various classes) and durum the following varieties are either an S or MS: 5700PR, AAC Cameron, AAC Iceberg, AAC Tisdale, AAC Tomkins, AAC Warman, AAC Whitefox, AC Foremost , Cardale, CDC Abound, CDC Adamant, CDC Flare, CDC Pilar, Faller, Prosper, SY Natron, SY Rorke, SY Torach, and Unity. If you are growing a stripe rust susceptible variety, it will be important to keep an eye on your crops and follow further PCDMN cereal risk updates (https://prairiecropdisease.blogspot.com/).
e. Where farmers or consultants noticed stripe rust development on winter wheat in the fall of 2023, it is recommended to scout winter wheat fields that have resumed growth in spring 2024. Scouting is especially

critical where the variety being grown is susceptible/moderately susceptible to stripe rust. Currently, there are no early to mid spring reports of stripe rust on winter wheat.

5. Contacts for rust research and extension expertise

a. **Research**

i. Reem Aboukhaddour, A. Laroche, AAFC Lethbridge, AB, reem.aboukhaddour@agr.gc.ca, andre.laroche@agr.gc.ca. Stripe rust;
ii. H.R. Kutcher, University of Saskatchewan, Saskatoon, SK, randy.kutcher@usask.ca. Stripe rust;
iii. B. McCallum, AAFC Morden, MB, brent.mccallum@agr.gc.ca. Leaf rust and stripe rust;
iv. J. Menzies, AAFC Brandon/Morden, MB, jim.menzies@agr.gc.ca. Stem rust of wheat and oat, crown rust of oat.
v. S. Rehman, Western Crop Innovations (formerly Olds College), Field Crop Development Centre, Lacombe, AB, srehman@oldscollege.ca. Stripe and leaf rust;
vi. G. Brar, University of Alberta, gurcharn.brar@ualberta.ca. Stripe rust.

b. **Extension**

i. Alberta Ministry of Agriculture and Irrigation, Mike Harding, michael.harding@gov.ab.ca;
ii. Saskatchewan Ministry of Agriculture, Alireza Akhavan, alireza.akhavan@gov.sk.ca;
iii. Manitoba Ministry of Agriculture, David Kaminski, david.kaminski@gov.mb.ca.

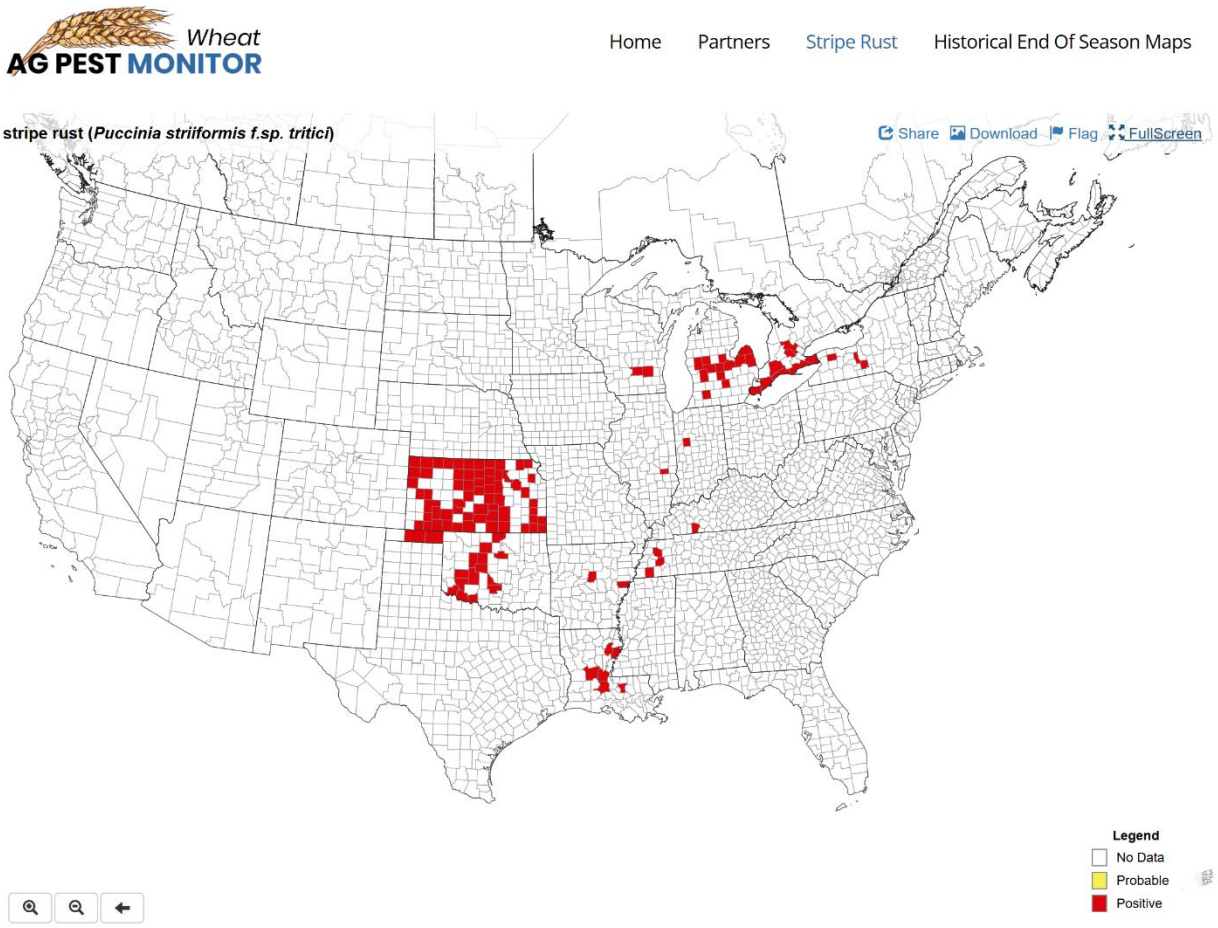

Figure 1. USA stripe rust observations, May 29, 2024 query of the AG PEST MONITOR: Wheat, https://wheat.agpestmonitor.org/stripe-rust/.

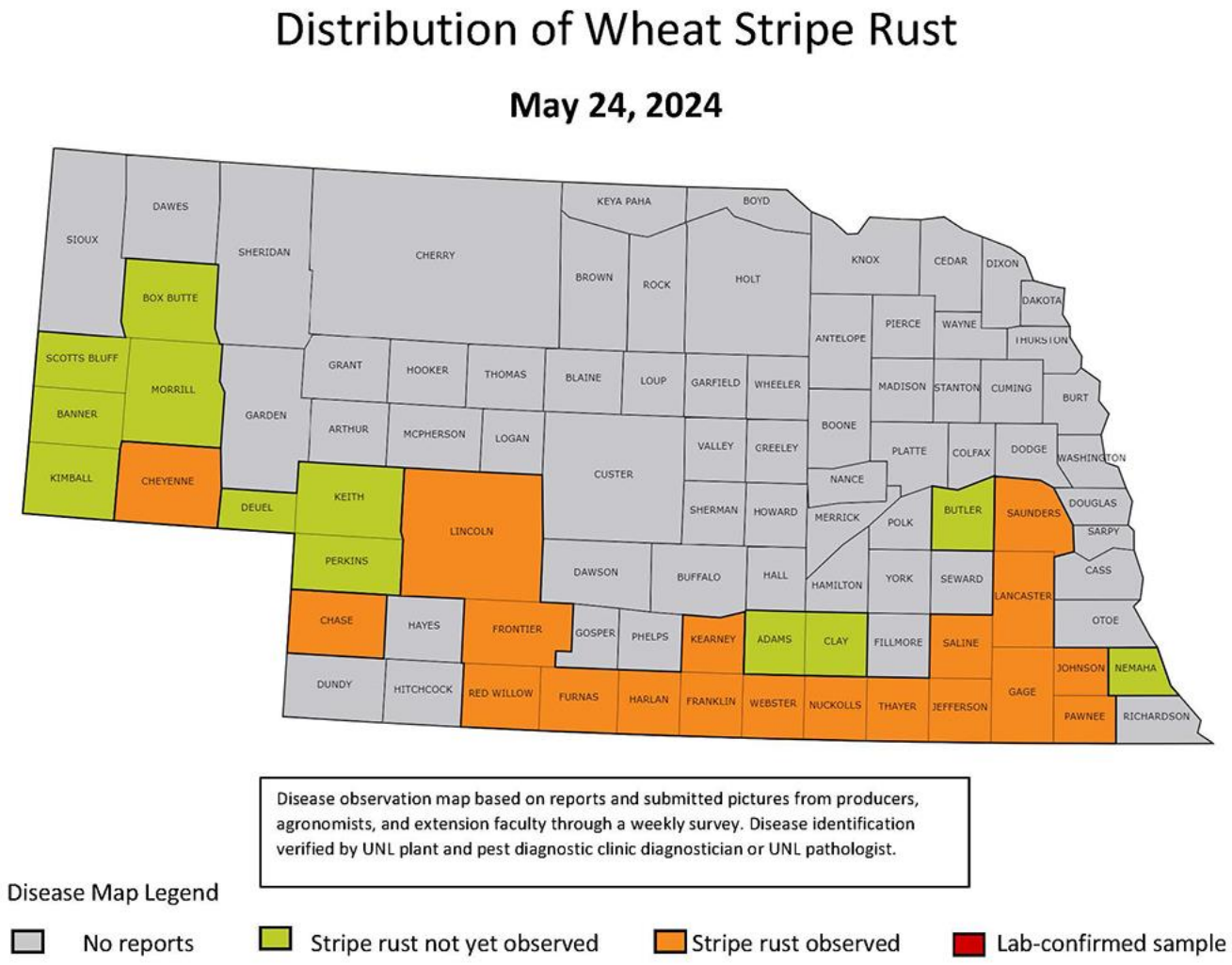

Figure 2. Stripe rust detections in Nebraska counties as of May 24, 2024 (Dr. S. Wegulo et al. May 23, 2024, https://cropwatch.unl.edu/2024/wheat-disease-update-may-23-2024).

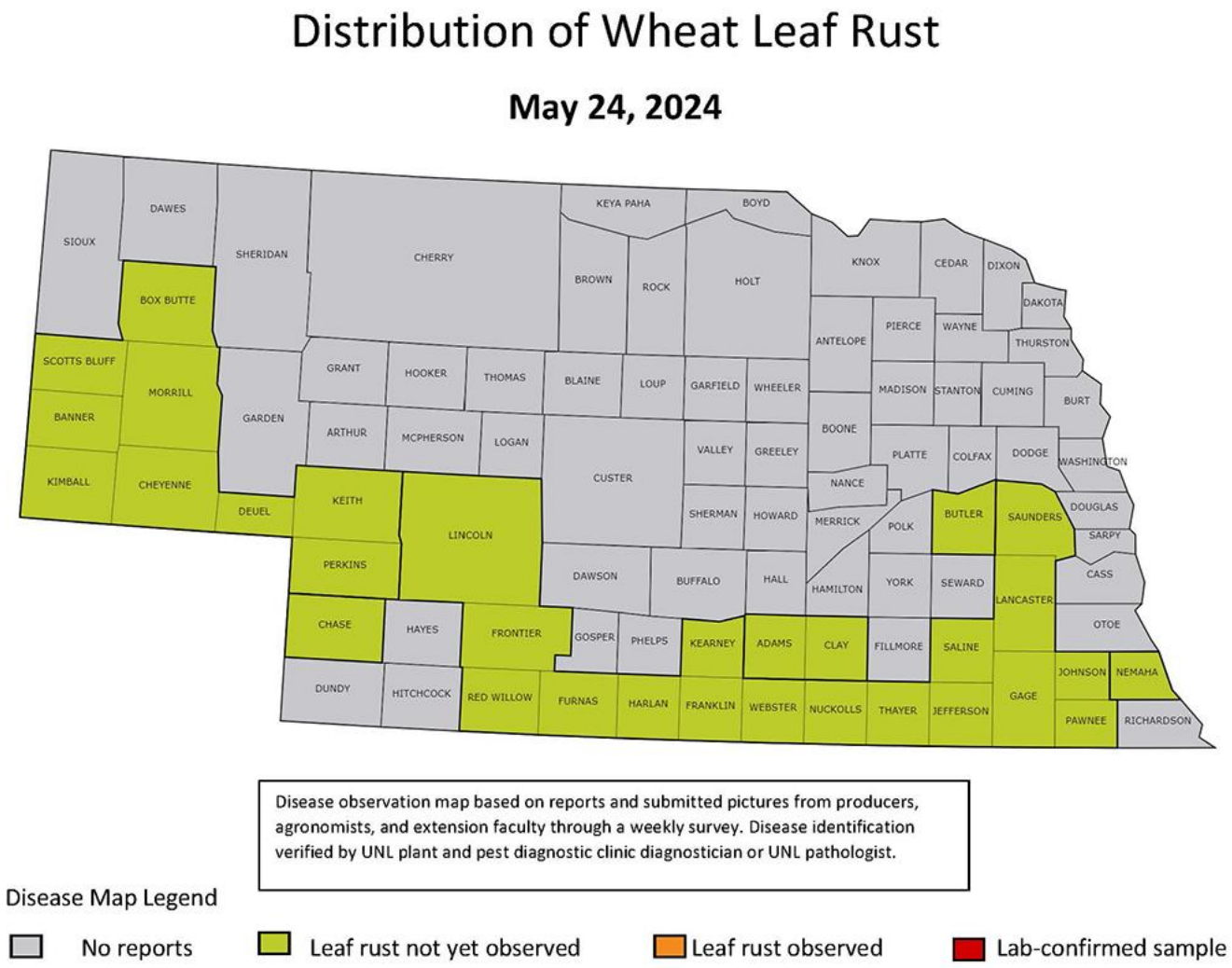

Figure 3. Leaf rust detections in Nebraska counties as of May 24, 2024 (Dr. S. Wegulo et al. May 23, 2024, https://cropwatch.unl.edu/2024/wheat-disease-update-may-23-2024).

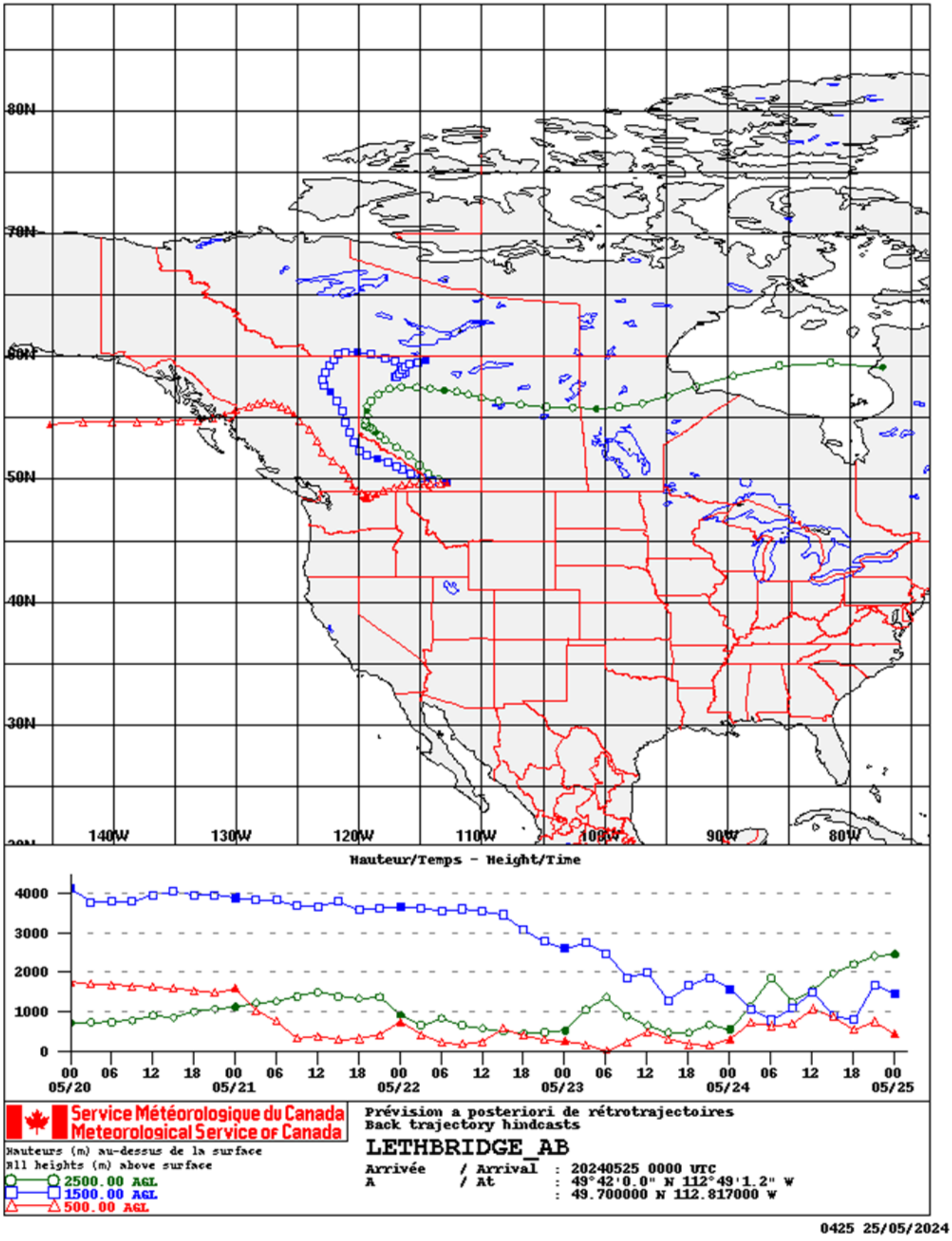

Figure 4. Reverse trajectories for Lethbridge, AB for the period of May 20-25, 2024.

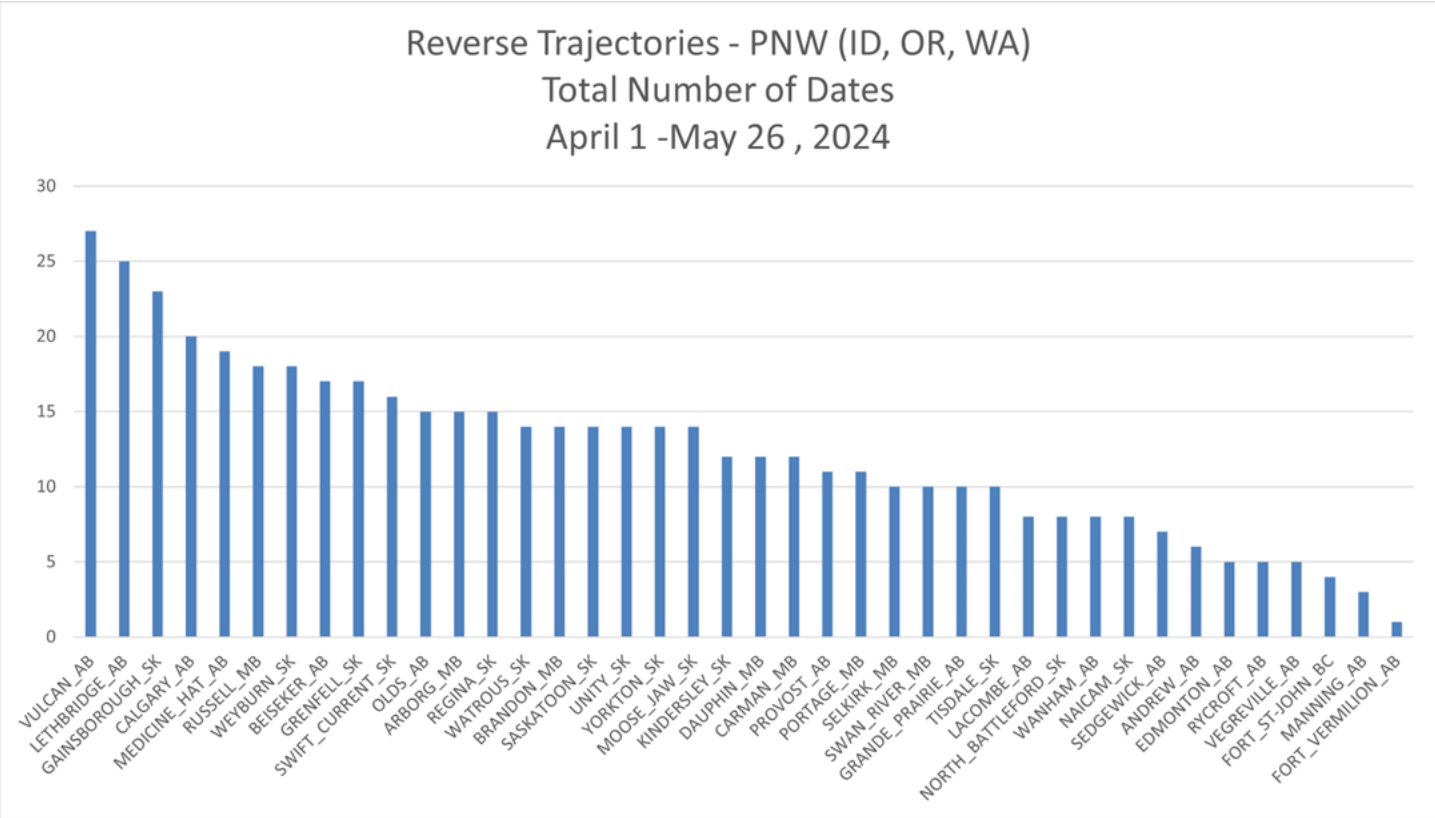

Figure 5. Reverse trajectory locations and number of events, for reverse trajectory events originating from the Pacific Northwest region of the USA, April 1 – May 26, 2024.

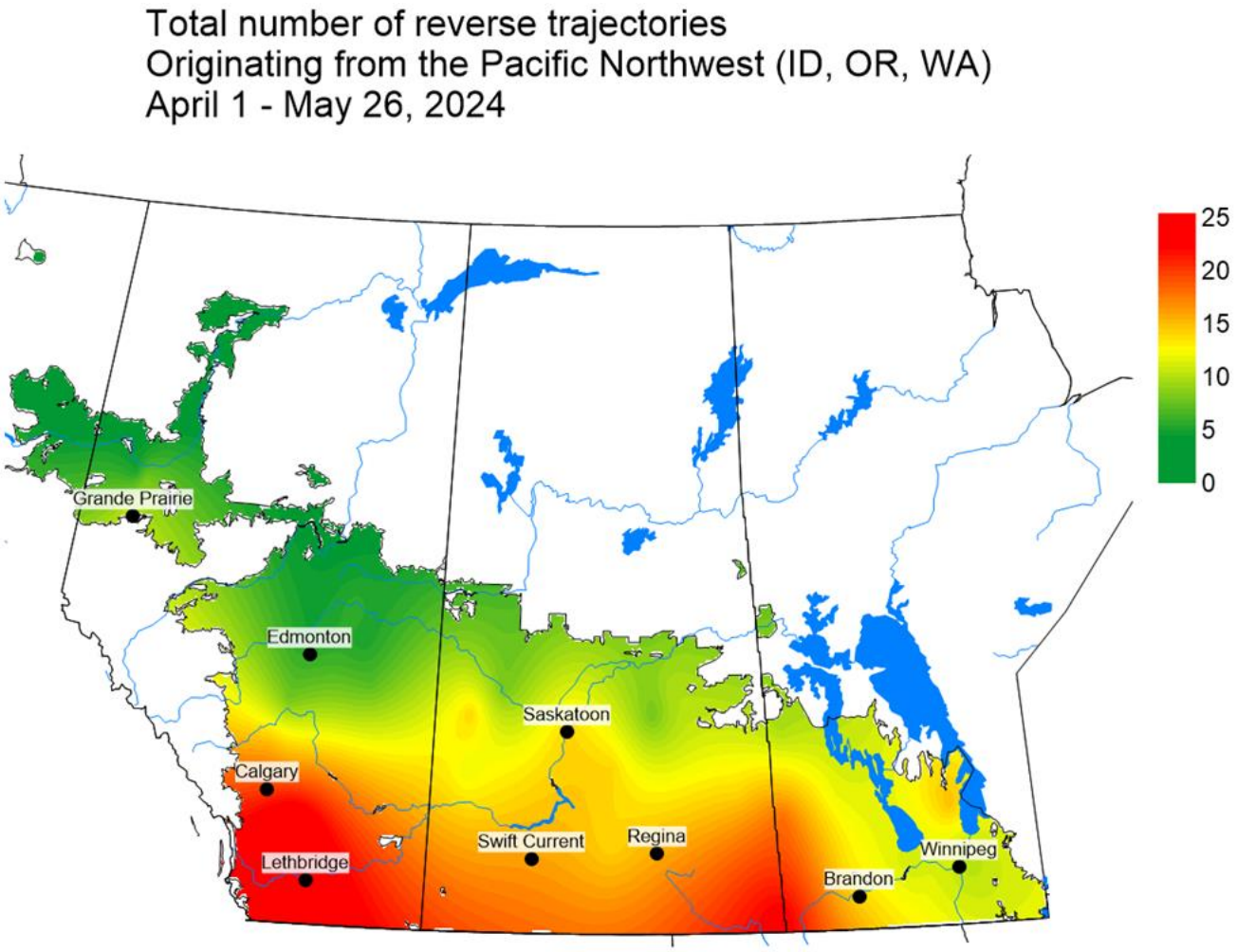

Figure 6. Total number of dates with reverse trajectories originating from the Pacific Northwest region of the USA that have crossed the prairies between April 1 – May 26, 2024.

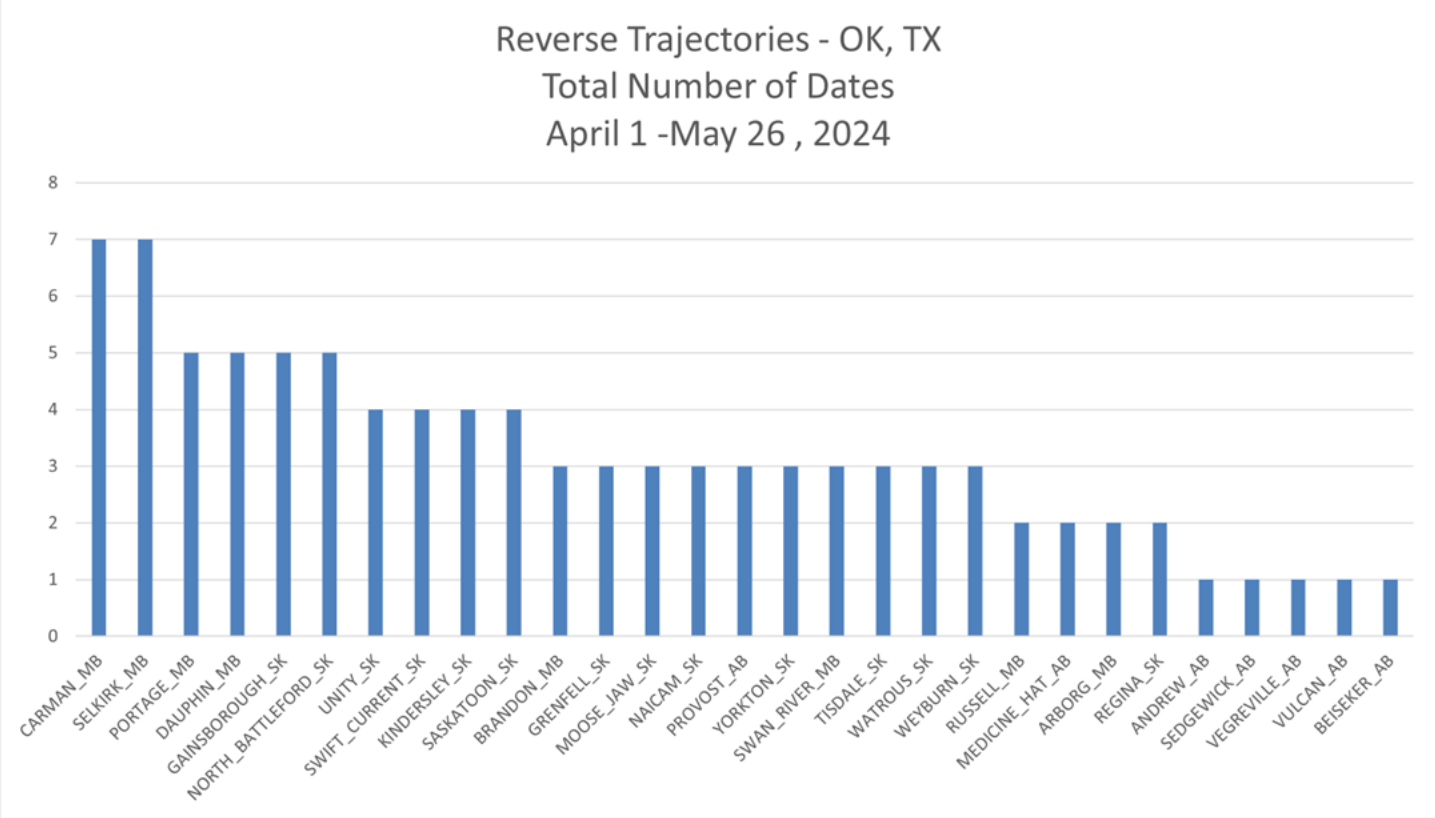

Figure 7. Reverse trajectory locations and number of events, for reverse trajectory events originating from Oklahoma and Texas, USA, April 1 – May 26, 2024.

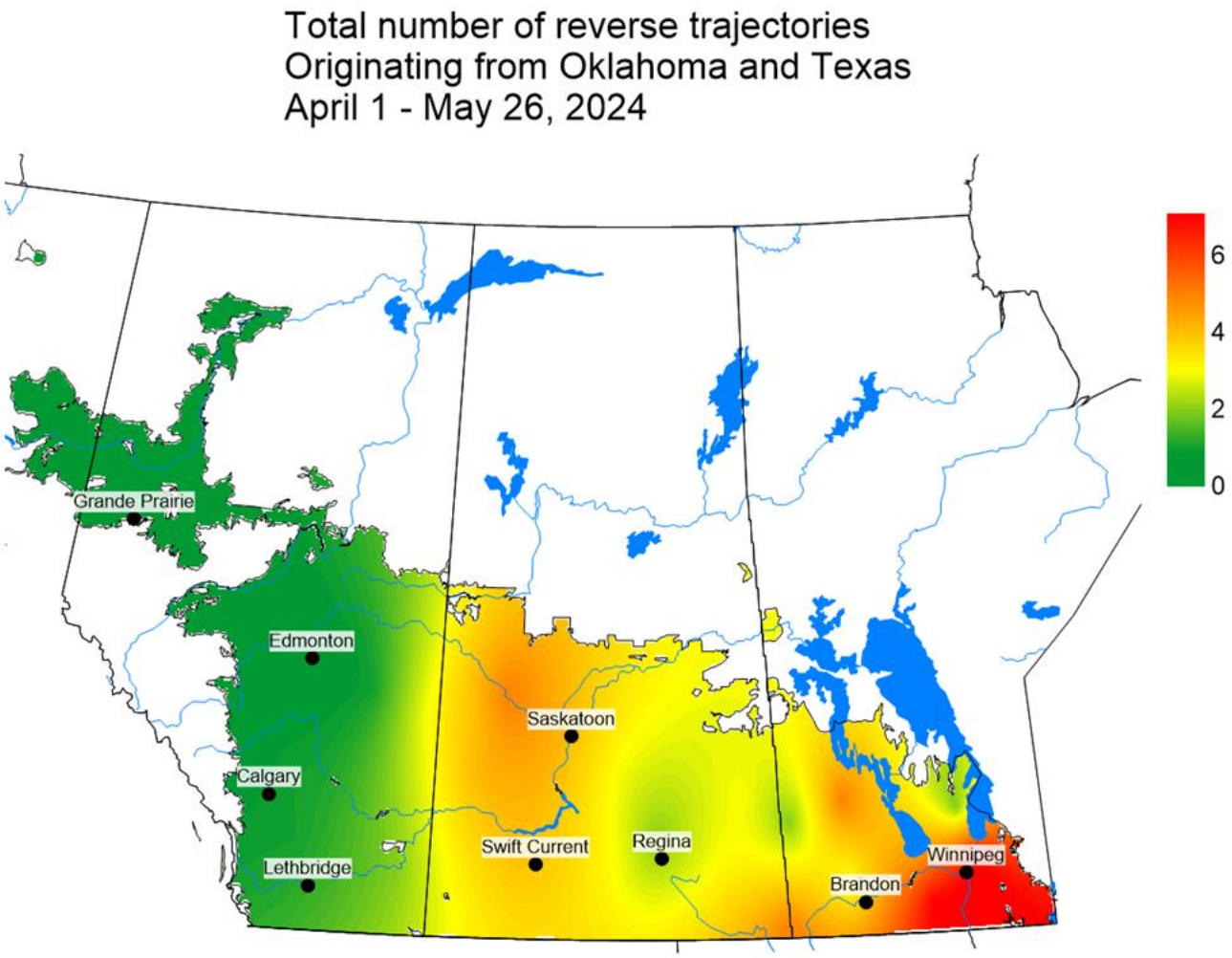

Figure 8. Total number of dates with reverse trajectories originating from Oklahoma and Texas that have crossed the prairies between April 1 – May 26, 2024.

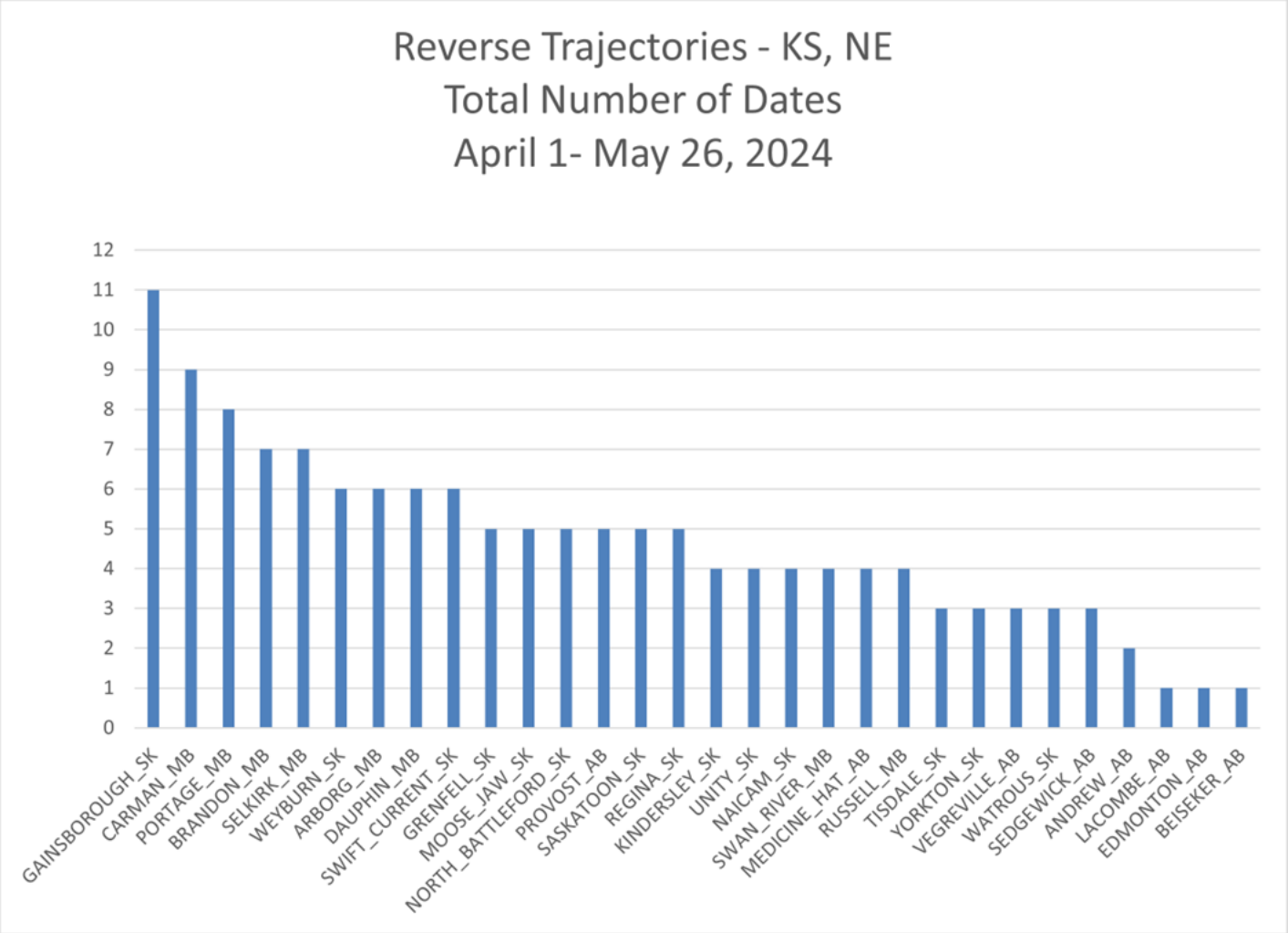

Figure 9. Reverse trajectory locations and number of events, for reverse trajectory events originating from Kansas and Nebraska, USA, April 1 – May 26, 2024.

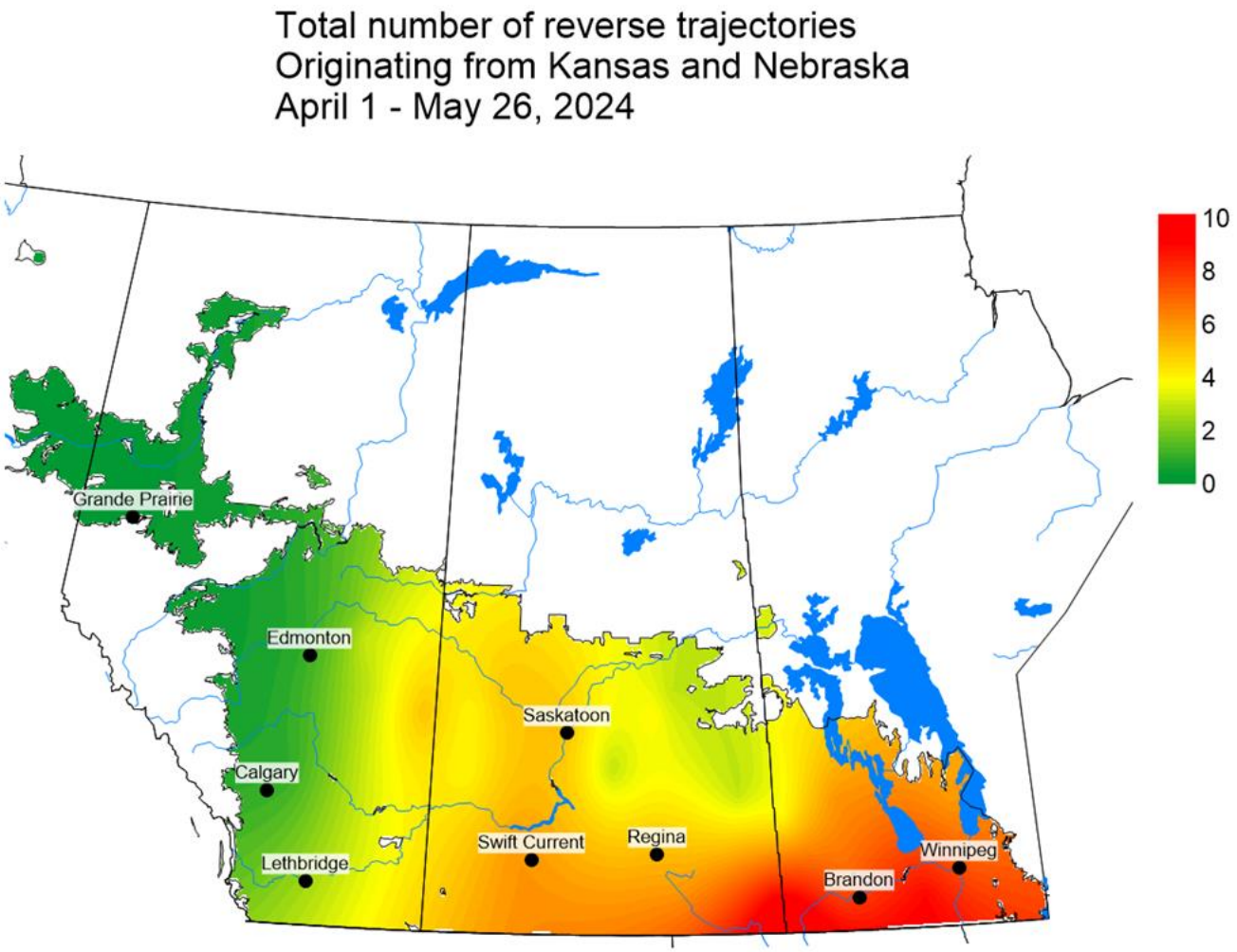

Figure 10. Total number of dates with reverse trajectories originating from Kansas and Nebraska that have crossed the prairies between April 1 – May 26, 2024.

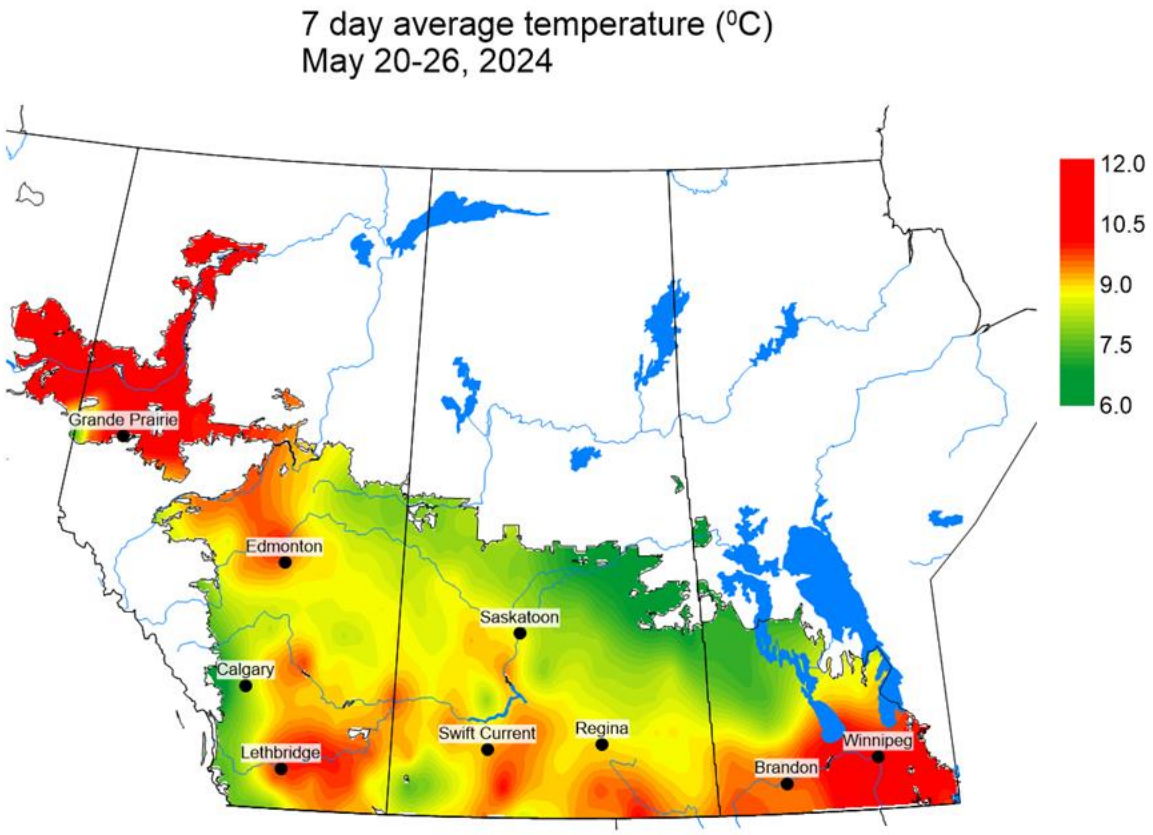

Figure 11. Seven day average temperature (⁰C) observed across the Canadian prairies for the period of May 20-26, 2024.

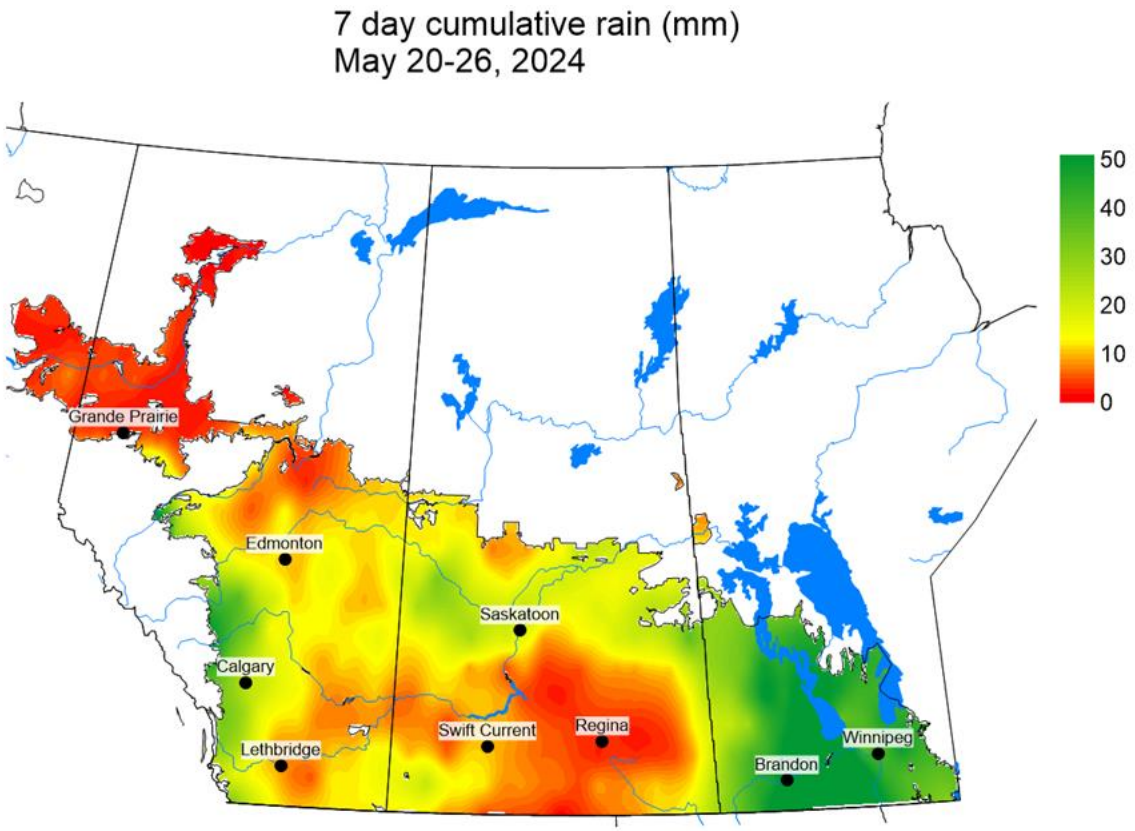

Figure 12. Seven day cumulative rainfall (mm) observed across the Canadian prairies for the period of May 20-26, 2024.

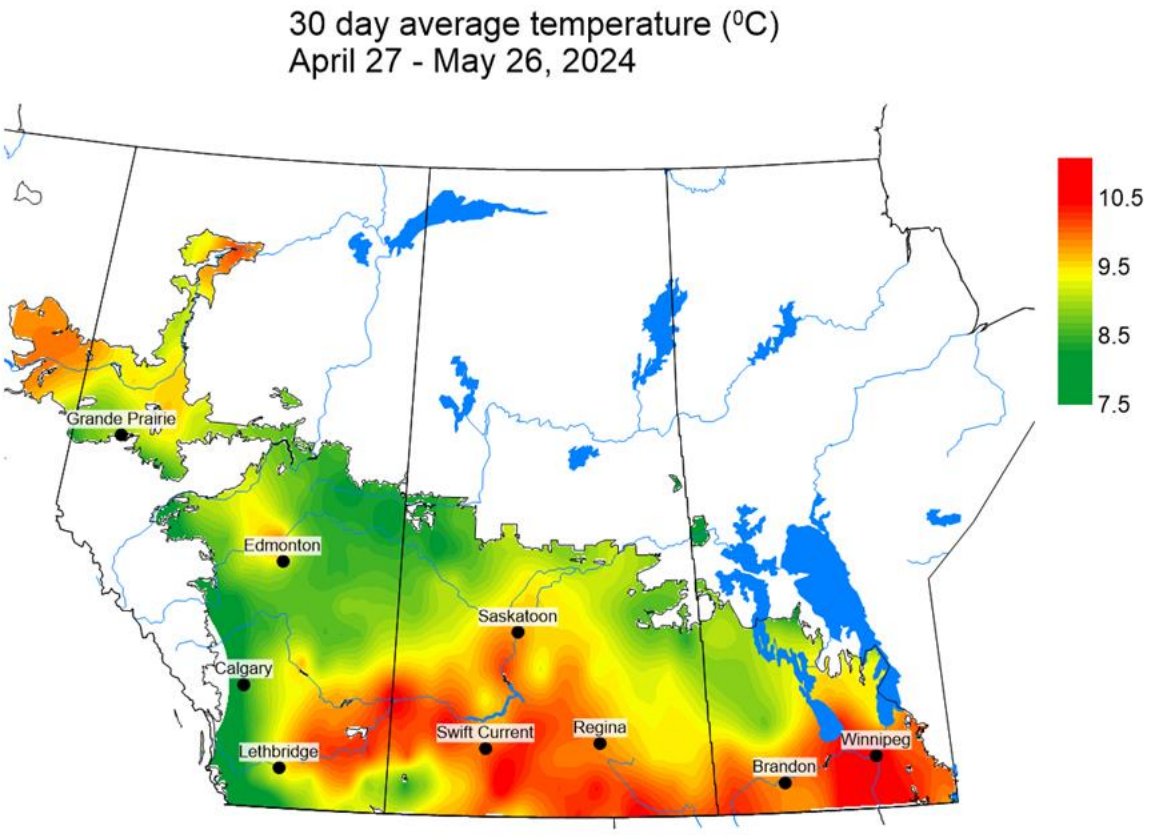

Figure 13. 30-day average temperature (⁰C) observed across the Canadian prairies for the period of April 27 – May 26, 2024.

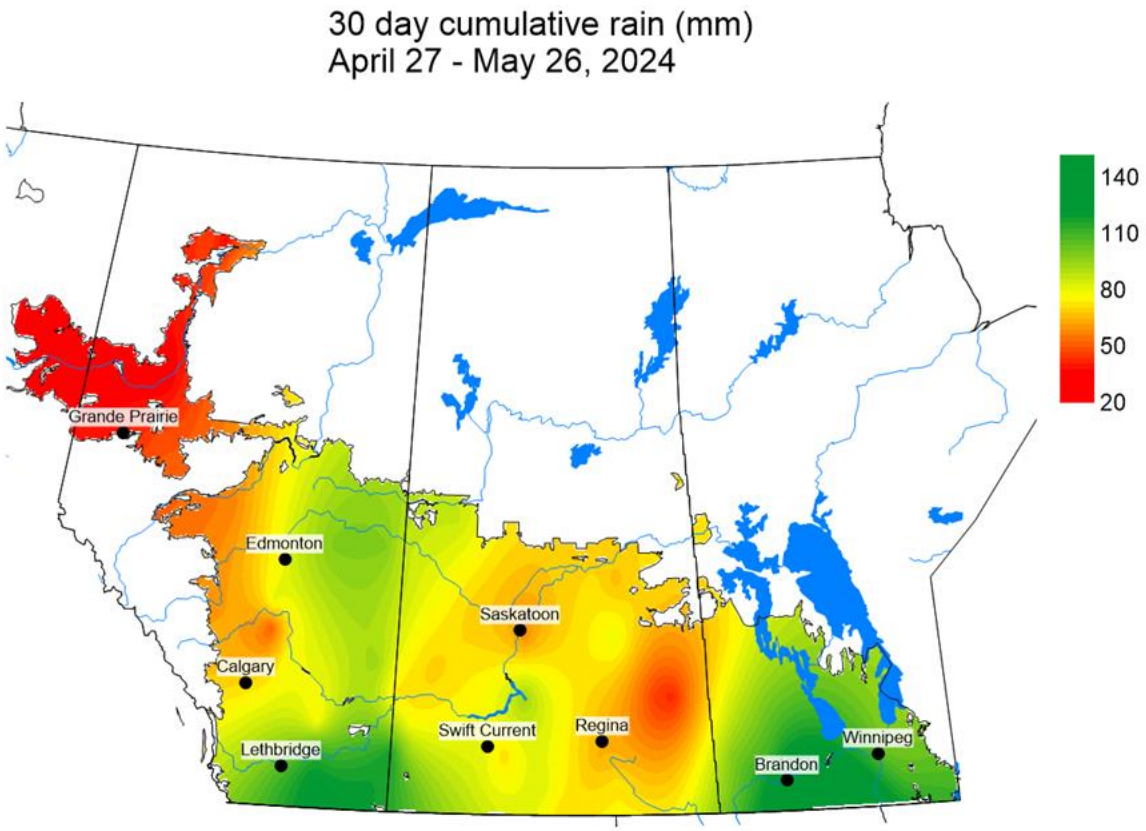

Figure 14. 30-day cumulative rainfall (mm) observed across the Canadian prairies for the period of April 27 – May 26, 2024.

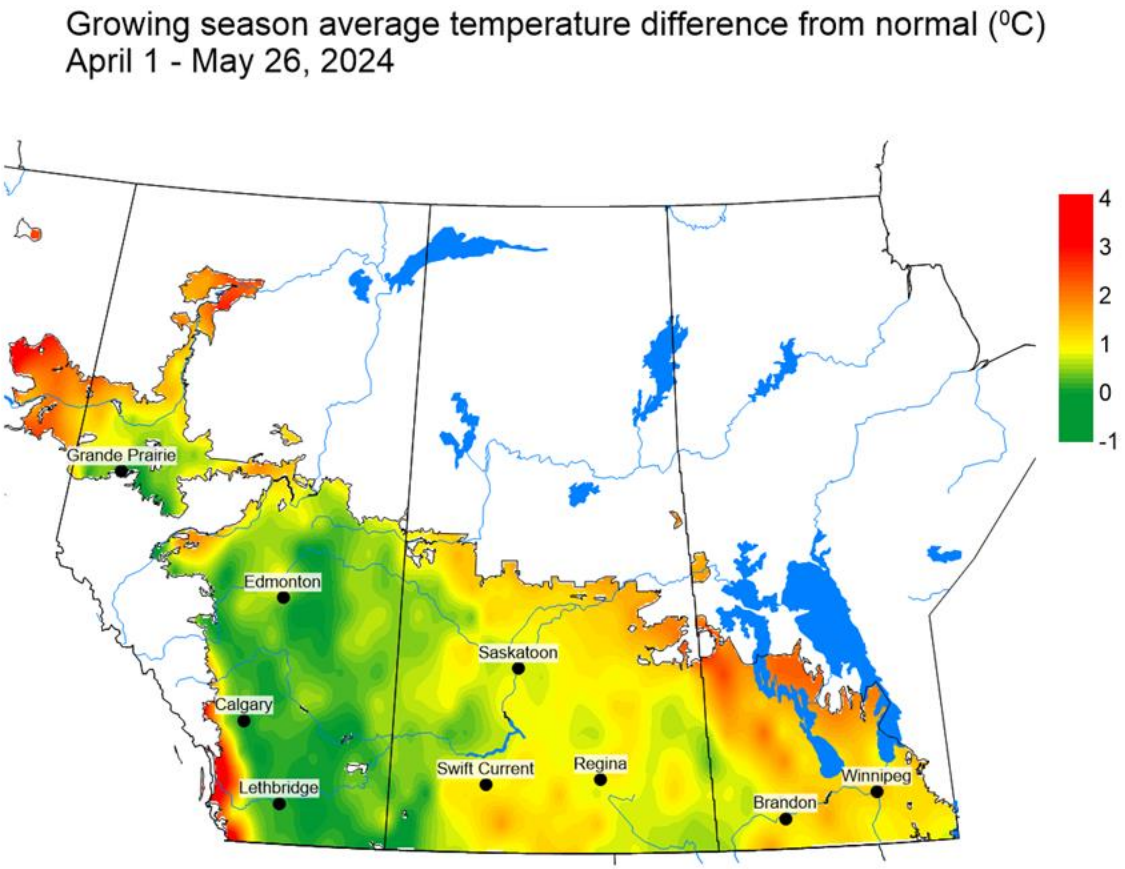

Figure 15. Growing season average temperature difference from climate normal (⁰C) observed across the Canadian prairies for the period of April 1 – May 26, 2024.

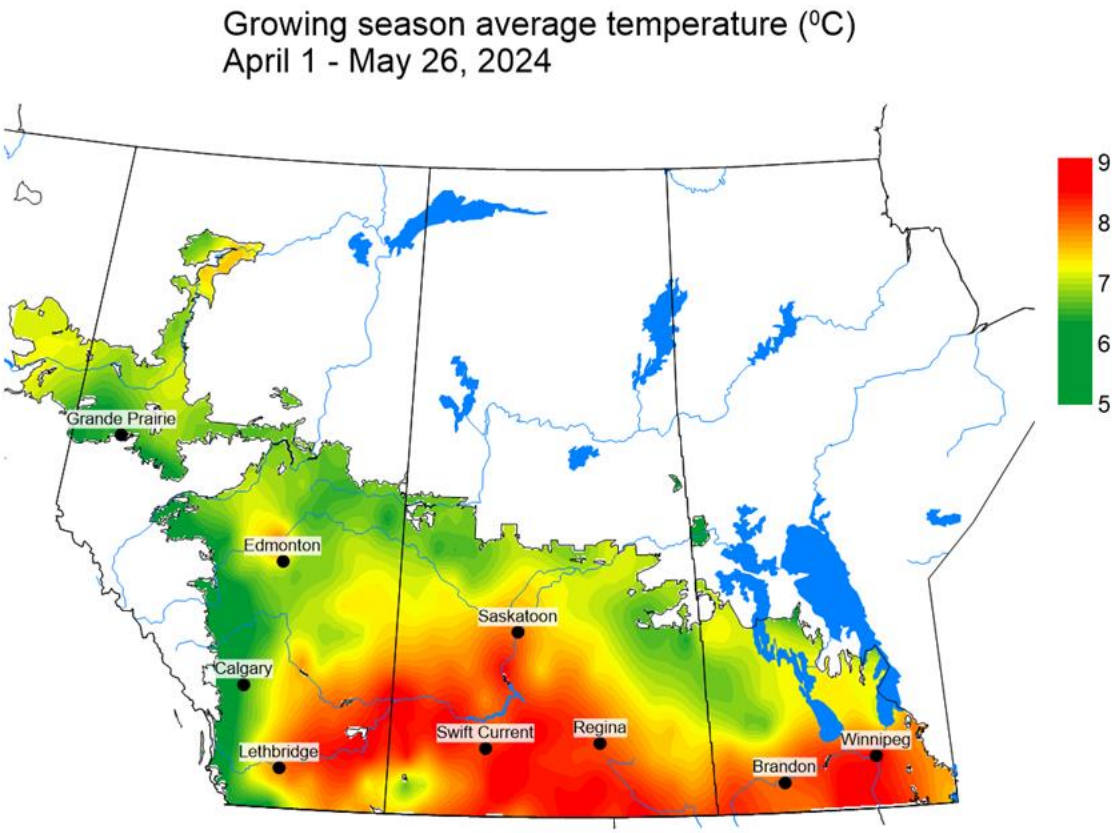

Figure 16. Growing season average temperature (^{0}C) observed across the Canadian prairies for the period of April 1 – May 26, 2024.

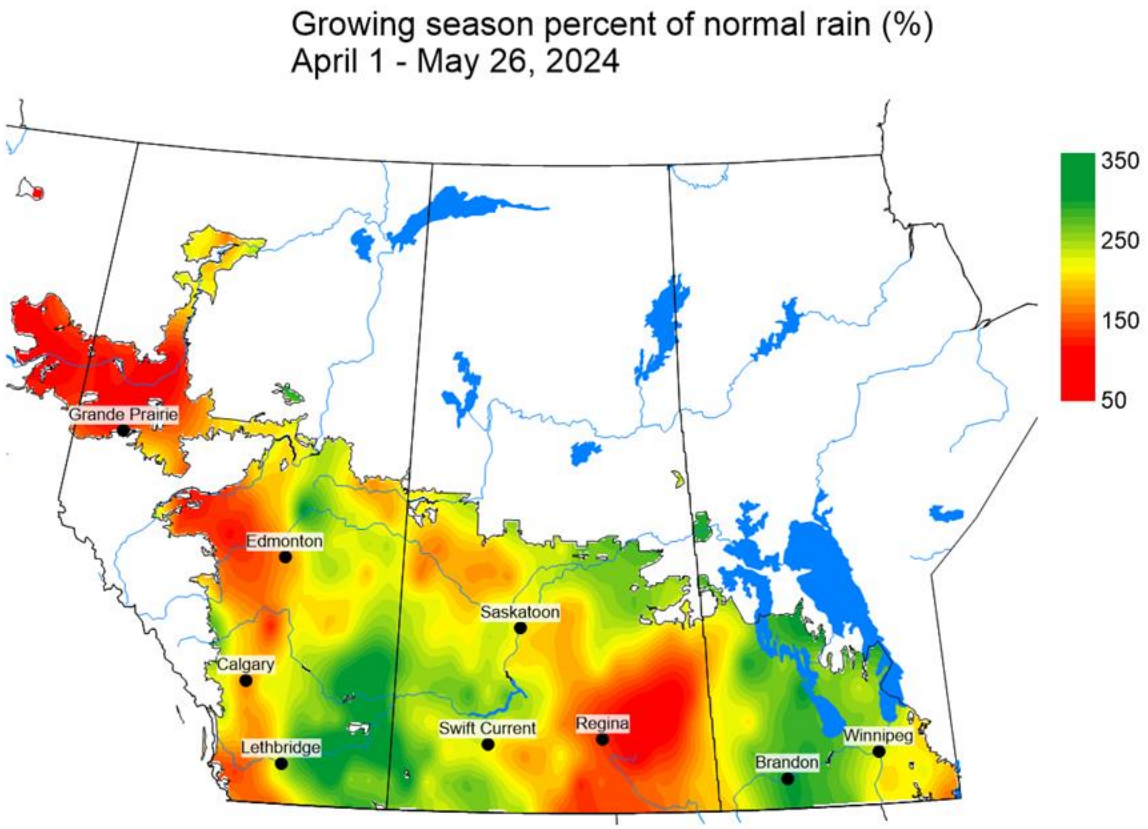

Figure 17. Growing season percent of normal rain (%) observed across the Canadian prairies for the period of April 1 – May 26, 2024.

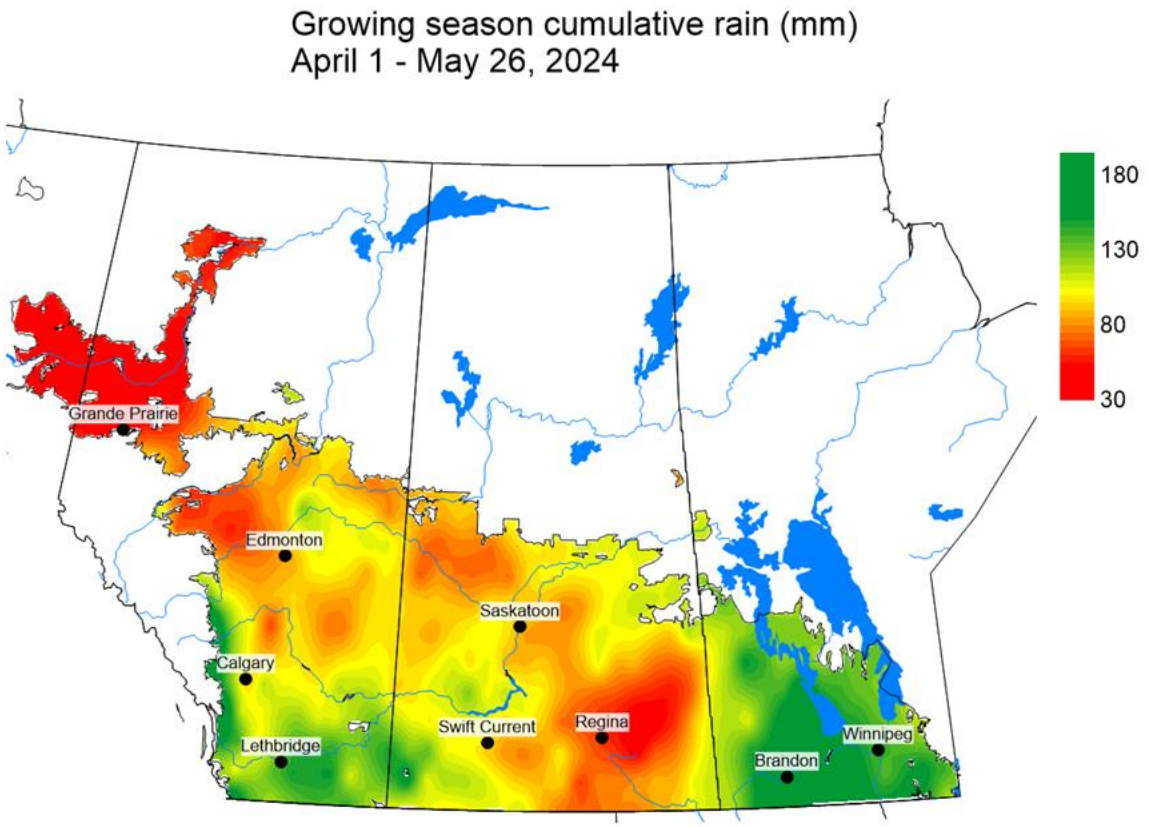

Figure 18. Growing season cumulative rainfall (mm) observed across the Canadian prairies for the period of April 1 – May 26, 2024.

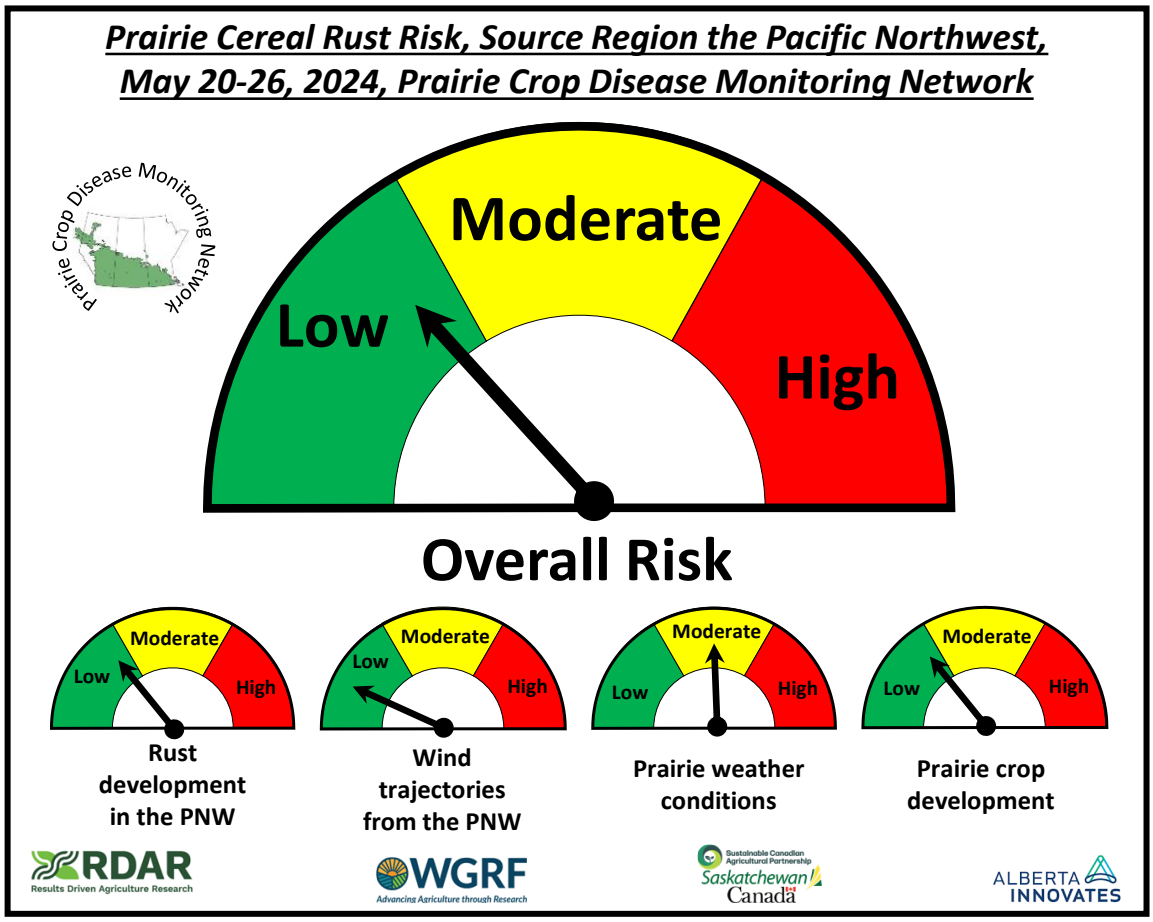

Figure 19. Prairie cereal risk speedometers for stripe rust from the Pacific Northwest, May 20-26, 2024.

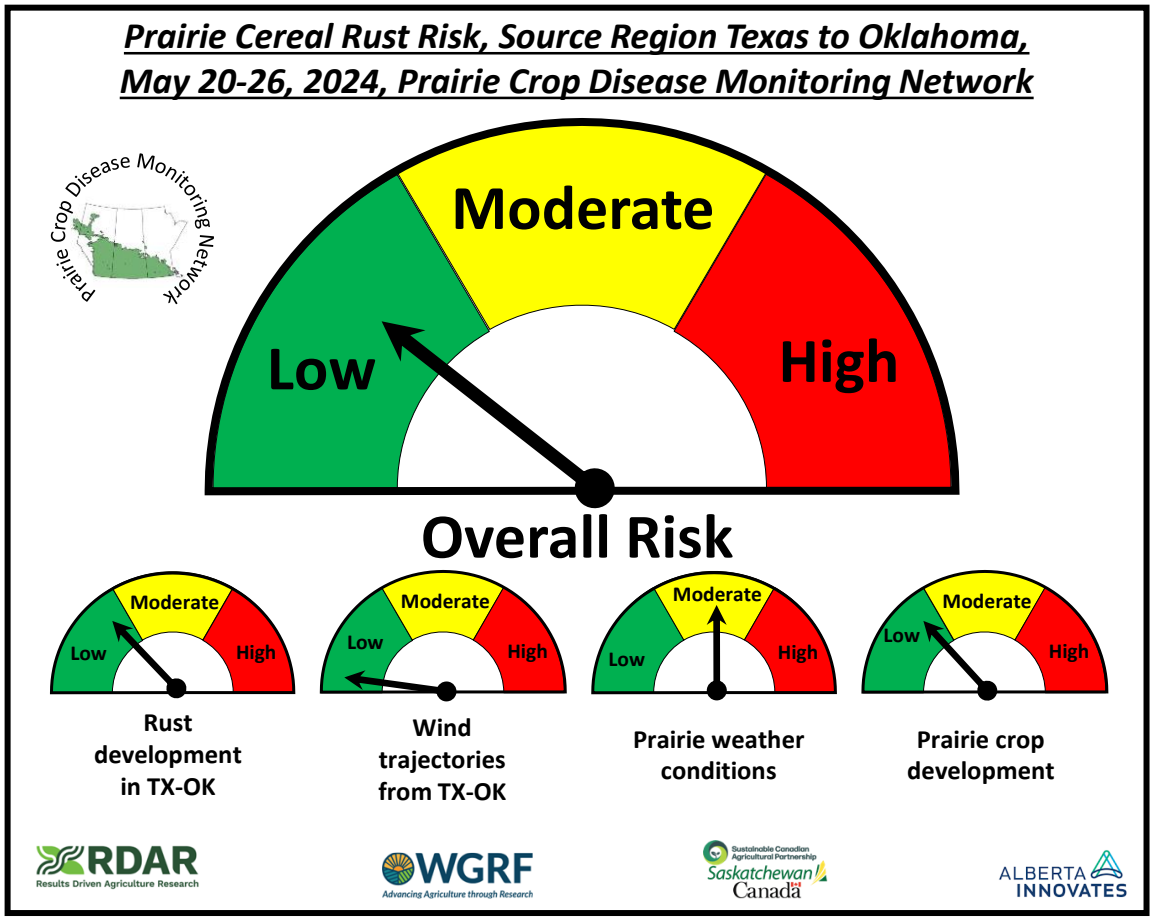

Figure 20. Prairie cereal risk speedometers for stripe/leaf rust from the Texas to Oklahoma region, May 20-26, 2024.

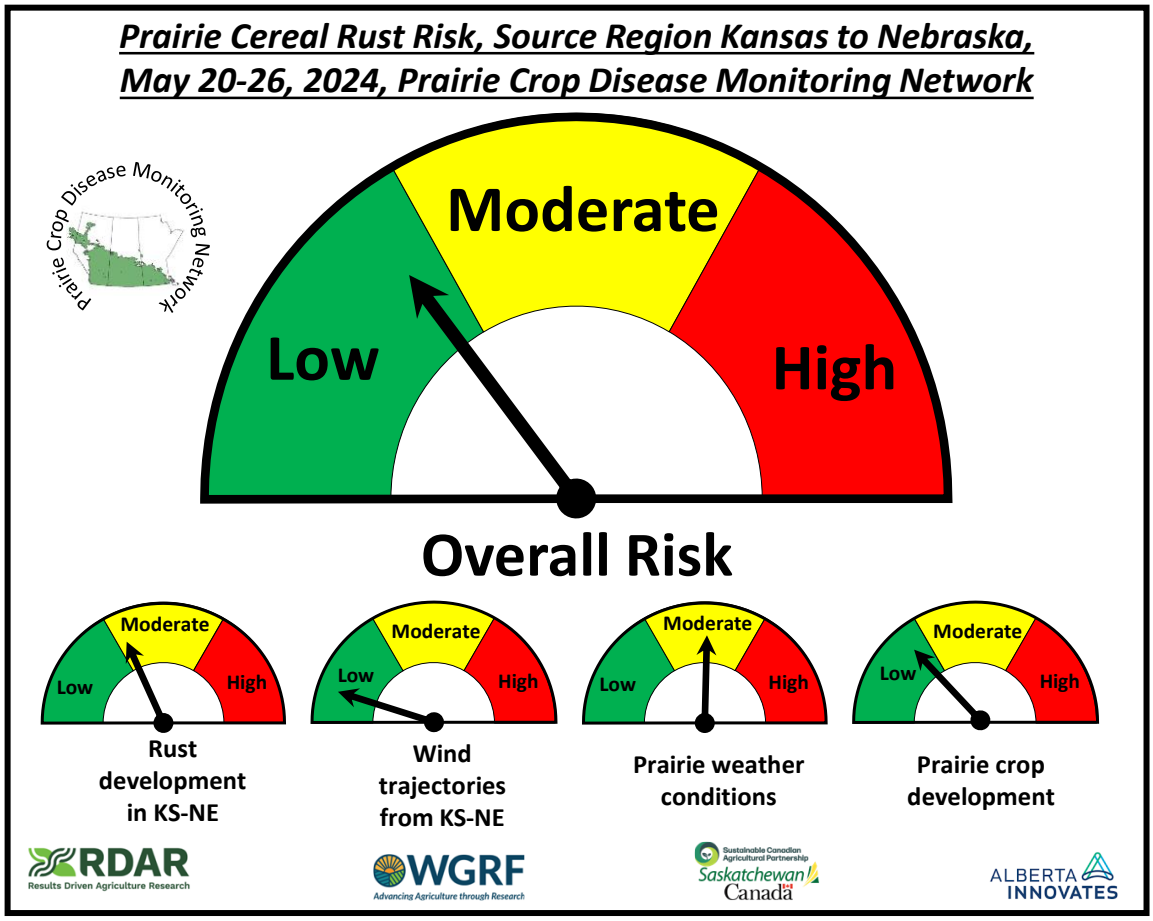

Figure 21. Prairie cereal risk speedometers for stripe/leaf rust from the Kansas/Nebraska region, May 20-26, 2024.

Table 1. Reverse trajectory locations, arrival dates, and number of events, for reverse trajectory events originating from the Pacific Northwest region of the USA, May 20-26, 2024.

Location	Province	20-May-24	21-May-24	22-May-24	23-May-24	24-May-24	25-May-24	26-May-24	Total trajectories /location
ARBORG	MB		1	1	1				3
BEISEKER	AB							1	1
BRANDON	MB		1						1
CALGARY	AB							1	1
CARMAN	MB	1	1						2
DAUPHIN	MB			1					1
GAINSBOROUGH	SK	1				1			2
GRENFELL	SK	1							1
LETHBRIDGE	AB			1	1		1	1	4
MEDICINE HAT	AB							1	1
OLDS	AB							1	1
PORTAGE	MB				1				1
REGINA	SK	1							1
SELKIRK	MB		1						1
TISDALE	SK				1				1
VULCAN	AB							1	1
WEYBURN	SK	1							1
Total trajectories per date		**5**	**4**	**3**	**4**	**1**	**1**	**6**	**24**

Table 2. Reverse trajectory locations and number of events, for reverse trajectory events originating from Oklahoma and Texas, USA, May 20-26, 2024.

Location	Province	20-May-24	21-May-24	22-May-24	23-May-24	24-May-24	25-May-24	26-May-24	Total trajectories/location
DAUPHIN	**MB**						**1**		**1**
Total trajectories per date		**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**

Table 3. Reverse trajectory locations, arrival dates, and number of events, for reverse trajectory events originating from Kansas and Nebraska, USA, May 20-26, 2024.

Location	Province	20-May-24	21-May-24	22-May-24	23-May-24	24-May-24	25-May-24	26-May-24	Total trajectories/location
ARBORG	MB						1		1
BRANDON	MB							1	1
CARMAN	MB						1		1
DAUPHIN	MB						1	1	2
PORTAGE	MB							1	1
RUSSELL	MB							1	1
SELKIRK	MB						1		1
SWAN RIVER	MB						1		1
Total trajectories per date		**0**	**0**	**0**	**0**	**0**	**5**	**4**	**9**