PRAIRIE WIND TRAJECTORY AND CEREAL RUST RISK REPORT for May 14-20, 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, such as diamondback moth. In addition, plant pathologists have shown that trajectories can assist with the prediction of plant disease infestations and are also beginning to utilize these same data. We receive two types of model output from ECCC: reverse trajectories and forward trajectories.

'Reverse trajectories' (RT) refer to air currents that are tracked back in time from specified Canadian locations over a five-day period prior to their arrival date. Of particular interest are those trajectories that, prior to their arrival in Canada, originated over northwestern and southern USA and Mexico, anywhere diamondback moth populations overwinter and adults are actively migrating. If diamondback adults are present in the air currents that originate from these southern locations, the moths 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).

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. 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/).

v.

vi. **As of May 22, 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).

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. **As of May 22, 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).

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. 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/).

iv. As mentioned in the May 7-13, 2024 PCDMN rust risk update multiple detections of both stripe rust and leaf rust in numerous Nebraska counties were reported by Dr. S. Wegulo and colleagues from University of Nebraska (https://cropwatch.unl.edu/2024/wheat-disease-update-stripe-rust-confirmed-nebraska). In their May 17, 2024 update Dr. S. Wegulo and colleagues report further increases in the detection of stripe rust with reports of 17 counties being affected by low intensities

and mainly in southern regions (Figure 2, https://cropwatch.unl.edu/2024/wheat-disease-update-may-17-2024). As of May 17, 2024, leaf rust symptoms have not been observed in Nebraska (Figure 3, https://cropwatch.unl.edu/2024/wheat-disease-update-may-17-2024).

v. **As of May 22, 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.

vi. 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.topcropmanager.com/omafra-stripe-rust-management/; https://twitter.com/realagriculture/status/1791187946286002511);

2. Reverse trajectories (RT)

a. Since May 1, 2024 the majority of reverse trajectories that have crossed the Prairies have originated from the Pacific Northwest (Idaho, Oregon and Washington). This past week (May 14-20, 2024) many reverse trajectories were observed to originate over northern Canada, 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 (Figure 5). For the week of May 14-20, there have been 28 reverse trajectories that passed through the Prairie region. Many of these trajectories were reported to cross eastern Saskatchewan and Manitoba (Table 1). For the same period in 2023, the number of RT trajectories are crossing the Prairies have been similar for 2024 (n=593) and 2024 (n=596).

   i. **For the week of May 14-20, 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.**

c. **Oklahoma and Texas** – Since April 1, 92 reverse trajectories, originating over Oklahoma and Texas were reported to cross the Prairies (primarily crossed Manitoba and eastern Saskatchewan) (Figure 6). Compared with 2023 (n=38), the number of RT trajectories are crossing the Prairies have been greater in 2024 (n=93). Wind dispersal models did not predict that any reverse trajectories would have passed over the Prairies for the period of May 14-20.

   i. **For the week of May 14-20, 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 131 reverse trajectories, originating from Kansas and Nebraska have crossed the Prairies, primarily Manitoba and Saskatchewan (April 1 – May 20, 2024) (Figure 7). Compared with 2023 (n=107), the number of RT trajectories are crossing the Prairies have been greater in 2024 (n=132). Wind dispersal models did not predict that any reverse trajectories would have passed over the Prairies for the period of May 14-20.

   i. **For the week of May 14-20, 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 (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 spring wheat has either been planted or will be over the next 1-2 weeks with percentages of crops seeded ranging from around 15% up to 85% depending on the province

and region (https://open.alberta.ca/dataset/a8632ff6-a50d-496c-8dc6-7cee941b5977/resource/cdadbdaa-7315-475f-847e-4115d40cb9f0/download/agi-itrb-alberta-crop-report-2024-05-14-abbreviated-report.pdf; https://publications.saskatchewan.ca/api/v1/products/123595/formats/143959/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 13-19, 2024) the average temperature across the Prairies was 10.4 °C and was equal to climate normal values (Table 2). The warmest temperatures were observed across southern Manitoba and southeastern Saskatchewan. The average 30 day temperature (April 20 - May 19, 2024) was 9.2 °C and was 1.1°C warmer than the long term average temperature (Table 3). Similar to last week, the warmest location was at Alsask (10.5 °C); Beaverlodge and Grande Prairie reported the lowest average temperature (8.0 and 7.9 °C).

d. Most of the Prairies reported accumulated rain amounts that were greater than 10 mm. Average cumulative seven day rainfall was 19.6 mm (Table 2). Cumulative rainfall has been greatest along the Alberta-Saskatchewan border and across southern regions of Manitoba, Saskatchewan and Alberta. Total rainfall (mm) over the past 30 days was 64 mm and was 233% of climate normal values. So far, rainfall amounts in 2024 are much greater than last year (Table 3).

e. In 2023, rain for April 20 to May 19 was 48% of normal. Since April 1, the 2024 growing season has been 1.3 °C warmer than average and rain amounts have been 227% of climate normals (Table 4). Average air temperatures in 2024 have been approximately 0.5 °C warmer than 2023. The Parkland and Peace River regions have experienced above normal temperatures. Growing season rainfall has been above normal across most of the Prairies (Table 4). Southern regions of Alberta and Saskatchewan have had more than 200% of normal rainfall. Agroclimate maps are available at: https://www.agr.gc.ca/DW-GS/current-actuelles.jspx?lang=eng&jsEnabled=true.

f. 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 relatively low numbers of reverse wind trajectories that passed over the PNW region and into the Prairies, while stripe rust development is continuing, although levels are generally low, especially in commercial winter wheat fields in the PNW. Prairie winter wheat crops are progressing into the tillering stage, while much of the spring wheat crop has just been seeded or will be seeded over the next two weeks. **Overall, as of May 20, 2024 the risk of stripe rust appearance from the PNW is limited and scouting for this disease in the Prairie region is generally not urgent** (Figure 8).

b. **Texas-Oklahoma corridor** – There were no reverse wind trajectories that passed over the TX/OK region and into the Prairies from May 14-20, 2024, while stripe and leaf rust development are continuing, although levels are generally low, especially in commercial winter wheat fields in this region. Prairie winter wheat crops are progressing into the tillering stage, while much of the spring wheat crop has just been seeded or will be seeded over the next two weeks. **Overall, as of May 20, 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 9).

c. **Kansas-Nebraska corridor** – There were no reverse wind trajectories that passed over the KS/NE region and into the Prairies from May 14-20, 2024, while stripe and leaf rust development are continuing, albeit levels are generally low, especially in commercial winter wheat fields in this region. However, elevated stripe rust levels have been observed in central regions of Kansas. Prairie winter wheat crops are moving into the tillering stage, while much of the spring wheat crop has just been seeded or will be seeded over the next two weeks. **Overall, as of May 20, 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 10).

d. The early and widespread appearance of stripe rust in the PNW, TX/OK and KS/NE regions is still concerning. 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/). 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.

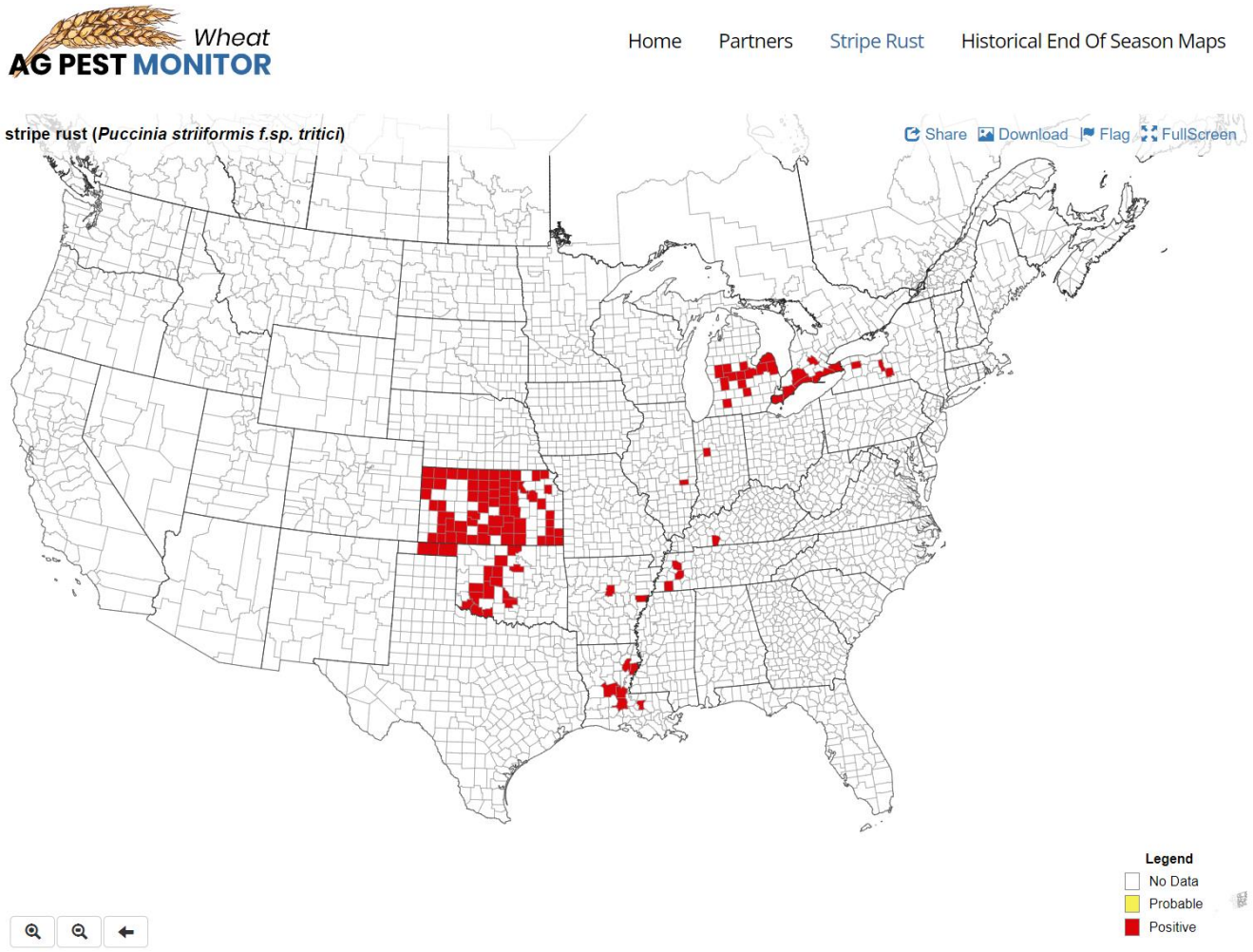

Figure 1. USA stripe rust observations, May 22, 2024, courtesy of AG PEST MONITOR: Wheat, https://wheat.agpestmonitor.org/stripe-rust/.

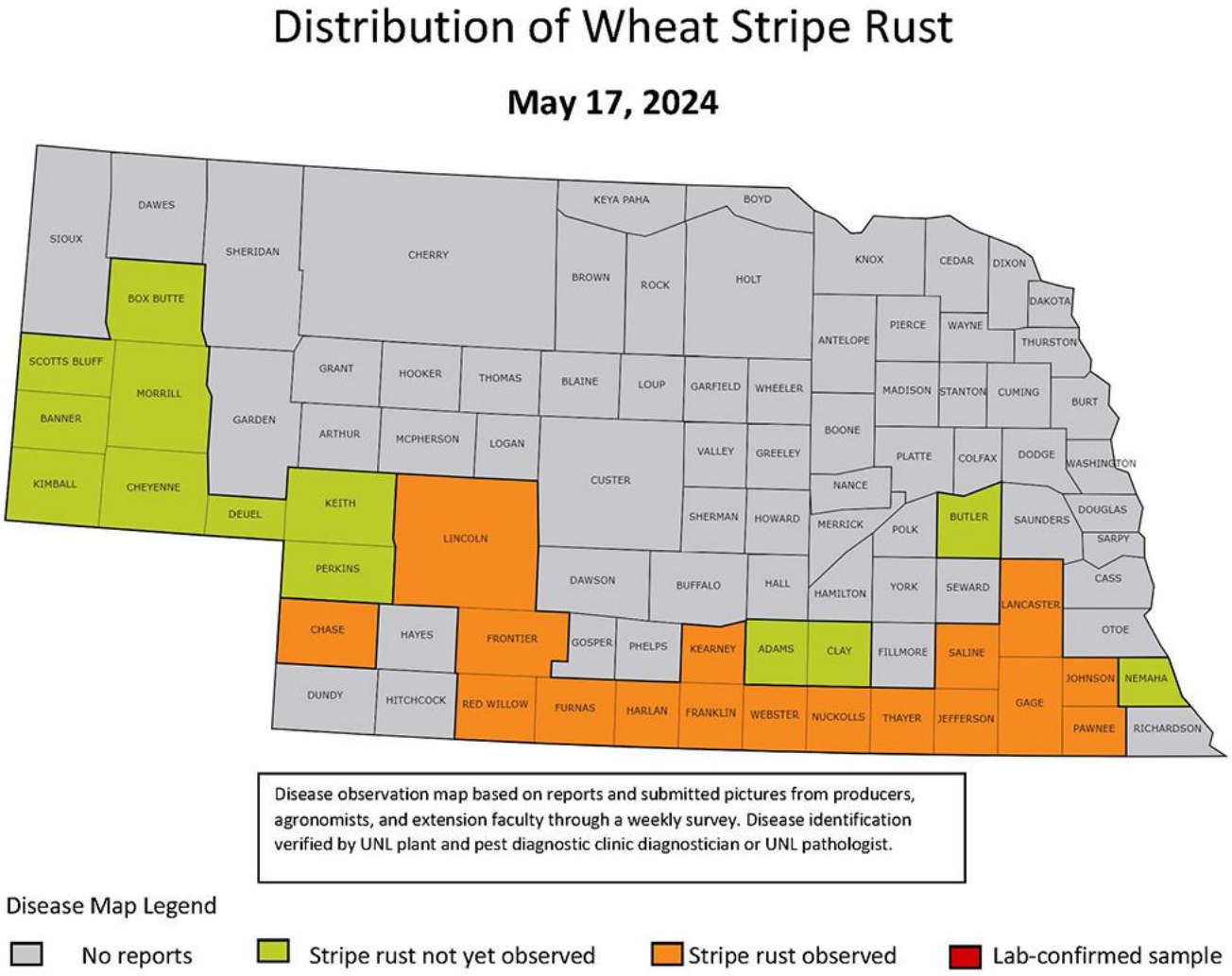

Figure 2. Stripe rust detections in Nebraska counties as of May 17, 2024 (Dr. S. Wegulo et al. May 10, 2024, https://cropwatch.unl.edu/2024/wheat-disease-update-may-17-2024).

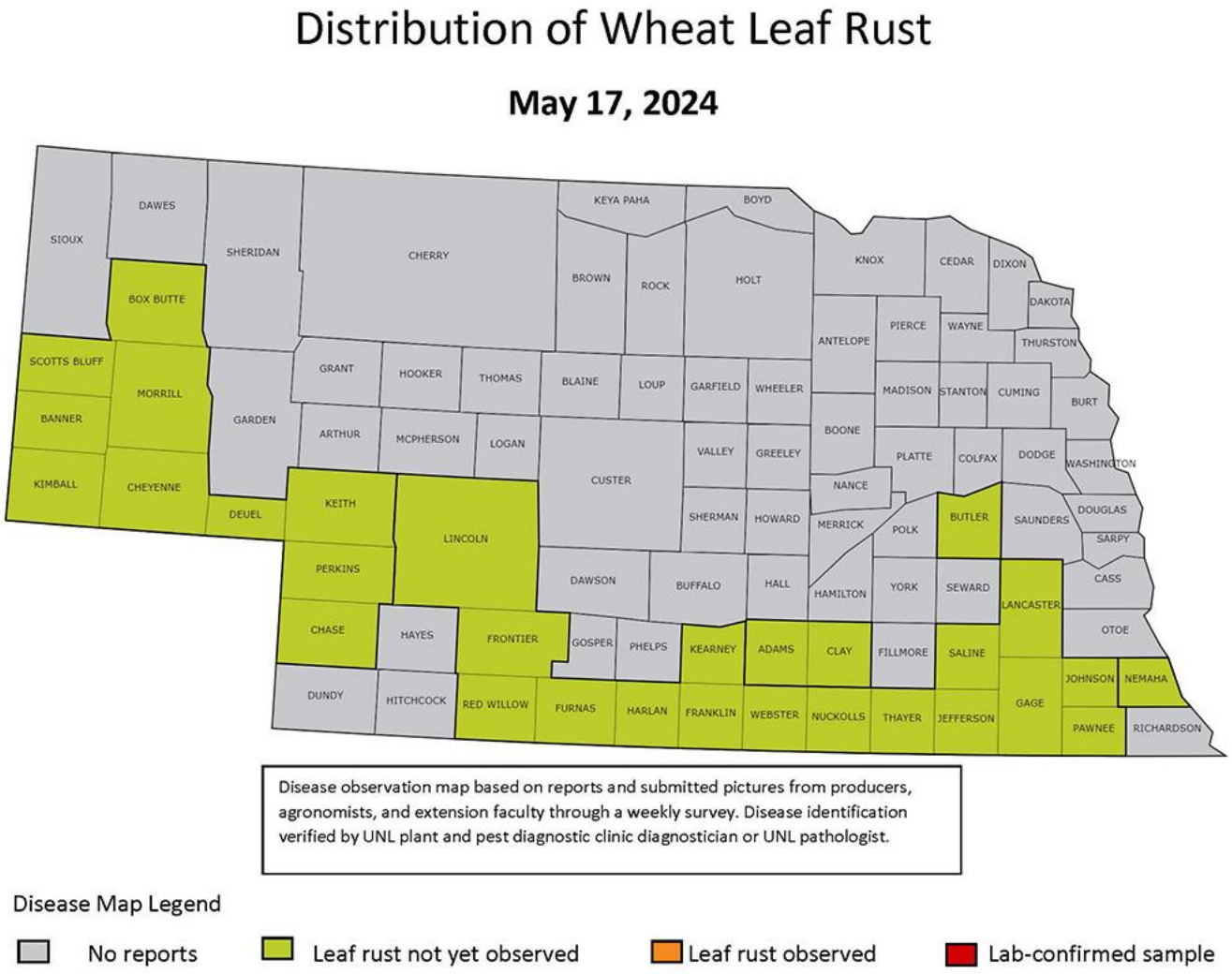

Figure 3. Leaf rust detections in Nebraska counties as of May 17, 2024 (Dr. S. Wegulo et al. May 17, 2024, https://cropwatch.unl.edu/2024/wheat-disease-update-may-17-2024).

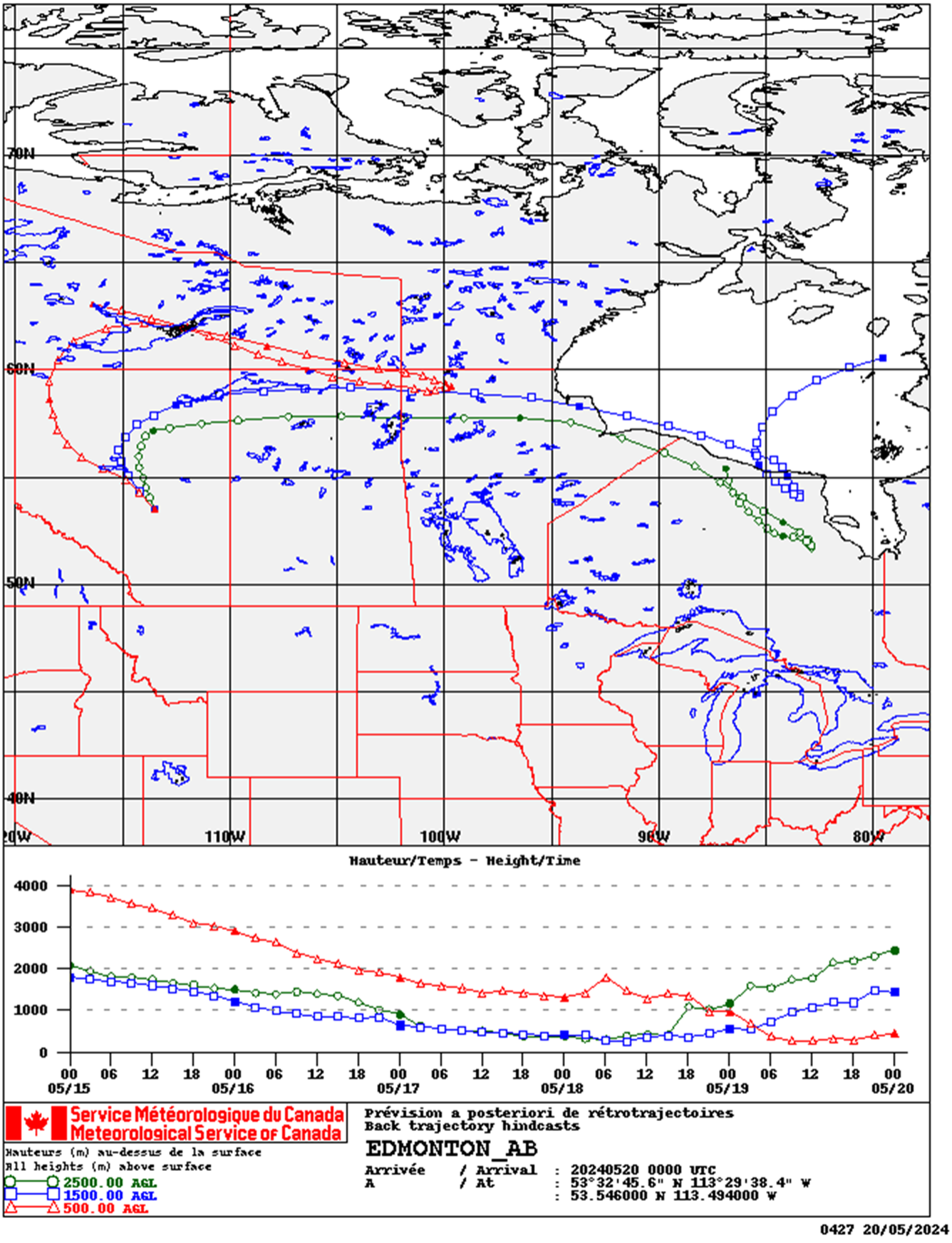

Figure 4. Reverse trajectories for Edmonton, AB for the period of May 15-20, 2024.

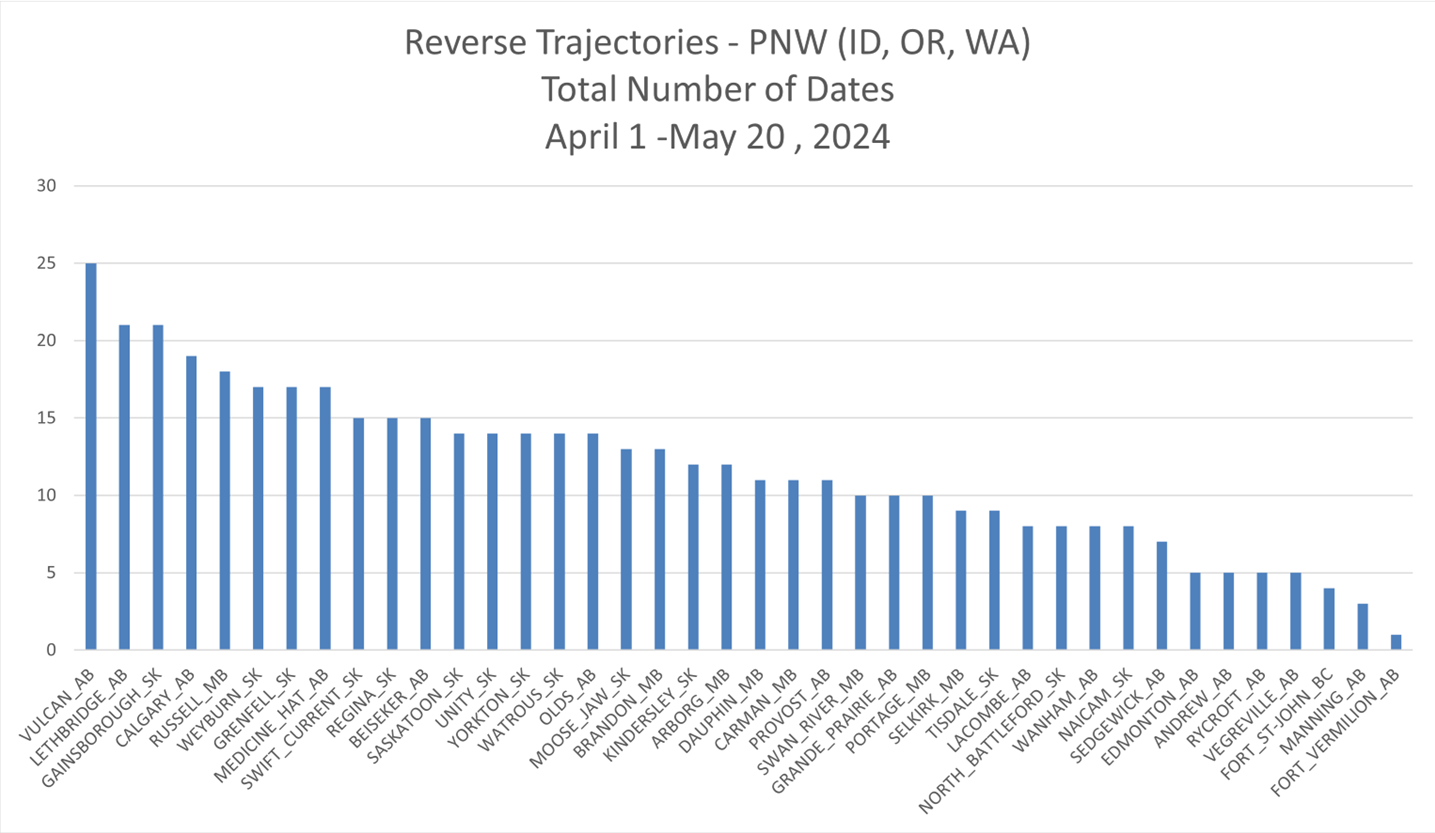

Figure 5. Reverse trajectory locations and number of events, for reverse trajectory events originating from the Pacific Northwest region of the USA, April 1 – May 20, 2024.

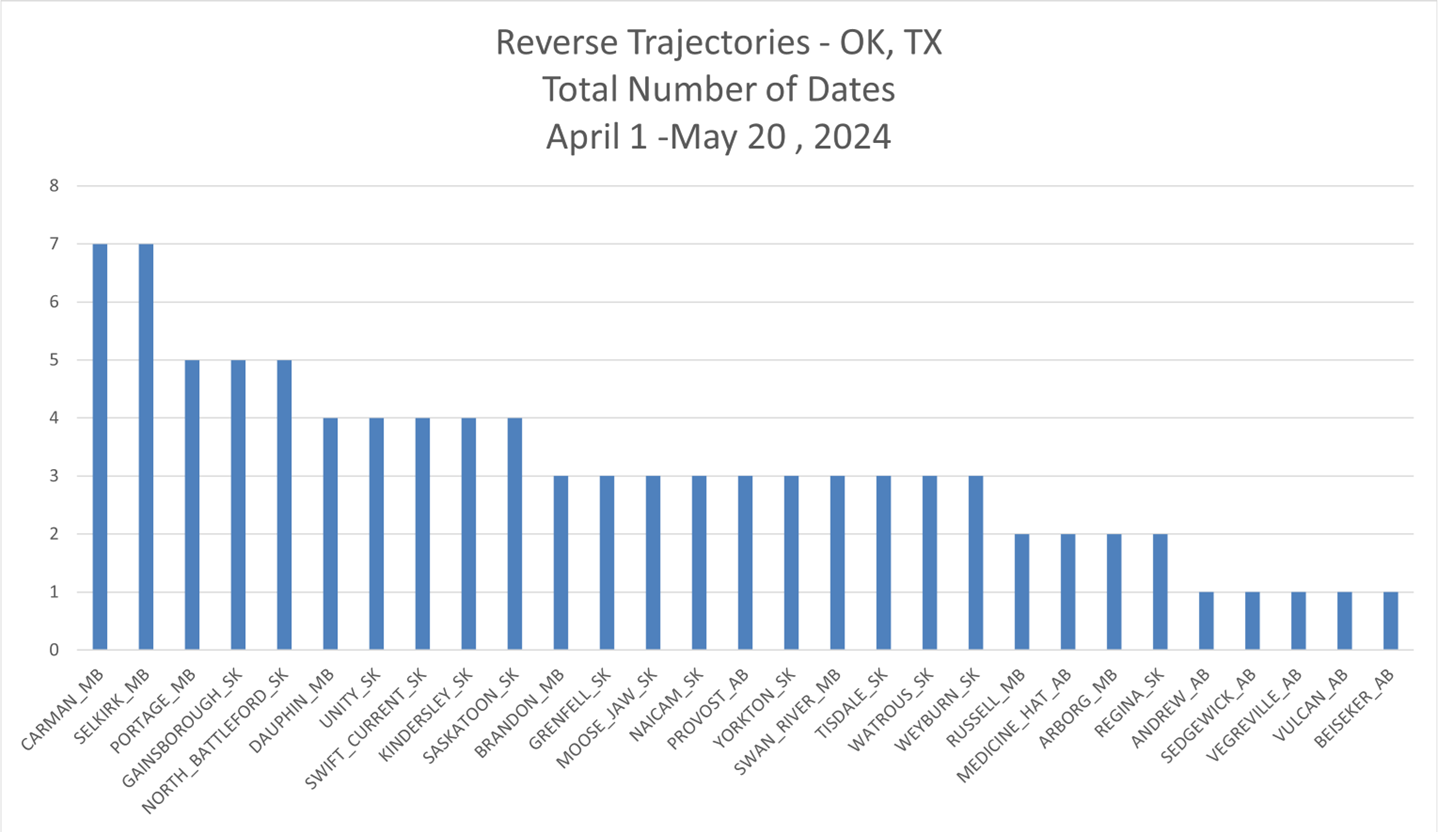

Figure 6. Reverse trajectory locations and number of events, for reverse trajectory events originating from Oklahoma and Texas, USA, April 1 – May 20, 2024.

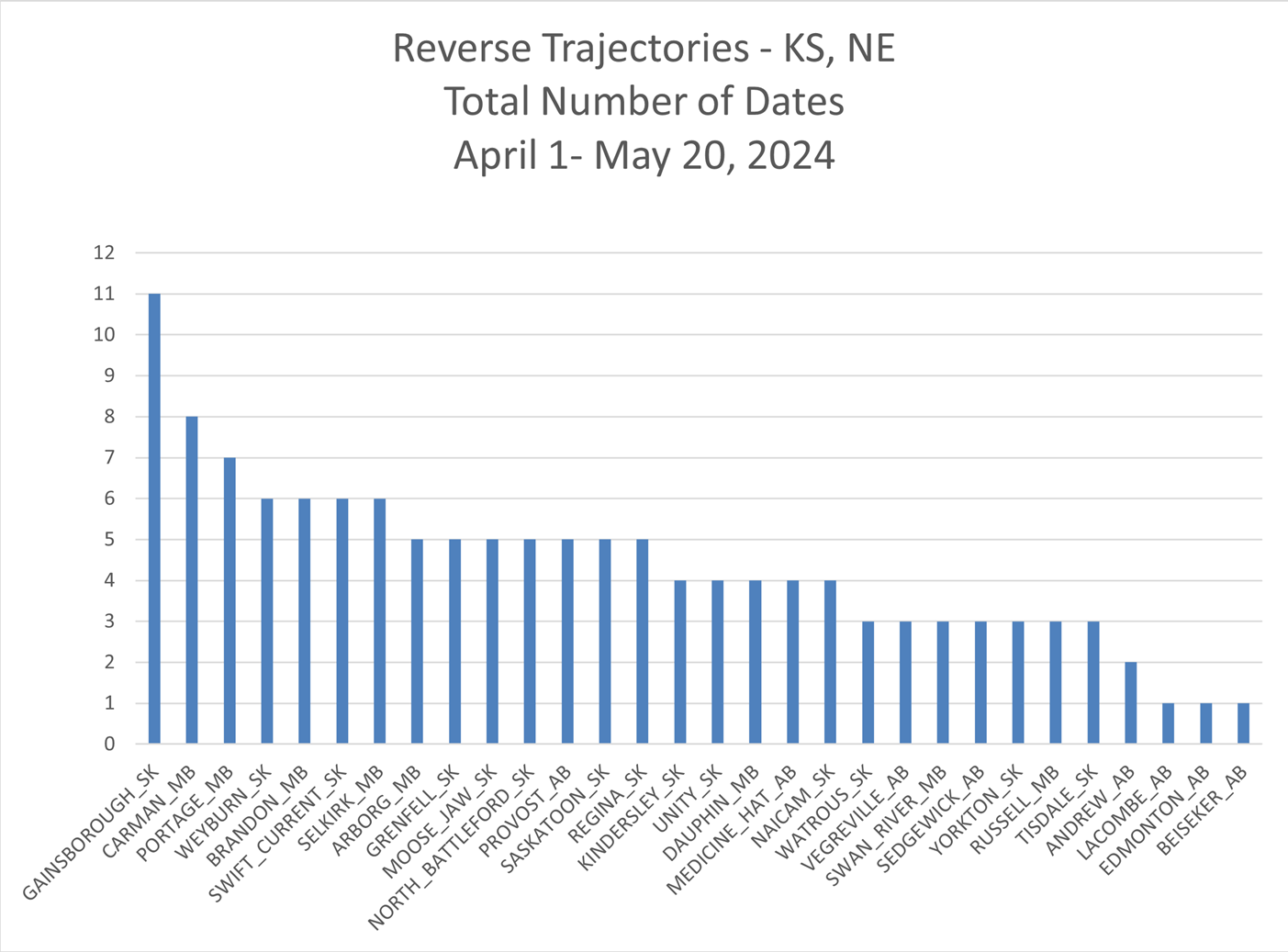

Figure 7. Reverse trajectory locations and number of events, for reverse trajectory events originating from Kansas and Nebraska, USA, April 1 – May 20, 2024.

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 14-20, 2024.

Location	Province	14-May-24	15-May-24	16-May-24	17-May-24	18-May-24	19-May-24	20-May-24	Total trajectories/location
ARBORG	**MB**			1	1	1			3
BRANDON	**MB**					1			1
CALGARY	**AB**			1	1				2
CARMAN	**MB**					1		1	2
GAINSBOROUGH	**SK**		1			1		1	3
GRENFELL	**SK**					1		1	2
LETHBRIDGE	**AB**	1					1		2
MEDICINE HAT	**AB**	1							1
NAICAM	**SK**					1			1
OLDS	**AB**	1							1
PORTAGE	**MB**					1			1
REGINA	**SK**							1	1
RUSSELL	**MB**	1				1			2
SELKIRK	**MB**					1			1
SWIFT CURRENT	**SK**	1				1			2
VULCAN	**AB**	1							1
WEYBURN	**SK**					1		1	2
Total trajectories per date		6	1	2	2	11	1	5	28

Table 2. Seven-day weather synopsis (temperature (Tavg, °C), observed temperature difference (°C) from climate normal, rain (mm) and rain percent of climate normal (%) for observed (OBS) and climate normal (CN) values across the Canadian Prairies for the period of May 13-19, 2024.

Location	Tavg (OBS) (^{0}C)	Tavg (CN) (^{0}C)	Tavg OBS difference from Climate Normals (^{0} C)	Rain (OBS) (mm)	Rain (CN) (mm)	% Of Normal
Alsask	11.7	11.9	-0.3	16.4	7.4	222.4
Assiniboia	11.5	11.2	0.4	20.9	7.4	280.6
Beaverlodge	8.4	9.7	-1.3	21.2	8.4	252.8
Bonneyville	8.8	10.4	-1.6	18.6	9.0	207.1
Brandon	11.1	10.7	0.5	32.9	9.2	356.1
Brooks	11.2	11.7	-0.5	12.1	7.1	170.0
Calgary	9.7	10.0	-0.3	18.2	7.6	238.5
Canora	9.8	10.1	-0.3	8.5	7.9	107.2
Carman	12.1	11.4	0.7	33.8	10.0	339.6
Cartwright	11.1	10.8	0.3	30.6	10.3	296.0
Coronach	11.9	11.1	0.8	16.3	7.6	215.8
Dauphin	10.3	8.9	1.4	22.8	7.2	314.8
Dawson Creek	9.2	8.0	1.2	11.6	8.0	144.9
Drumheller	10.2	11.0	-0.8	9.9	7.6	129.7
Edmonton	9.4	10.3	-0.9	17.6	11.5	152.8
Elbow	11.5	11.3	0.2	15.7	8.2	191.2
Estevan	11.9	11.5	0.4	9.7	7.9	122.3
Fairview	8.1	9.9	-1.8	14.5	8.6	168.0
Fort St. John	9.2	8.3	0.9	8.6	9.2	93.7
Fort Vermilion	8.1	8.0	0.1	38.7	7.8	495.5
Fox Valley	11.4	11.7	-0.3	18.1	7.8	232.3
Grande Prairie	8.1	10.0	-2.0	22.3	9.2	243.5
Hanna	10.4	10.9	-0.5	8.9	7.5	118.5
High Level	7.8	8.7	-0.9	27.9	7.0	400.0
Hudson Bay	10.4	8.9	1.5	23.8	7.2	332.1
Kindersley	10.5	11.0	-0.5	16.7	7.8	212.6
La Crete	8.2	8.7	-0.6	24.4	6.6	372.1
Lacombe	9.2	9.8	-0.6	14.9	12.0	123.7
Lethbridge	10.7	10.9	-0.2	23.2	8.6	270.7
Lloydminster	9.0	10.3	-1.3	23.0	8.7	265.7
Manning	7.7	9.2	-1.5	21.5	8.9	241.6
Maple Creek	11.5	11.6	-0.1	15.4	7.2	213.0
Mayerthorpe	9.0	10.0	-1.0	20.3	10.3	196.9
Meadow Lake	10.3	9.2	1.1	43.3	10.6	407.4
Medicine Hat	11.3	11.8	-0.4	13.1	6.9	191.0
Melfort	11.1	9.9	1.2	26.3	7.4	357.3
Melita	11.9	11.2	0.6	14.5	7.6	189.9
Melville	10.4	10.3	0.2	6.0	7.7	77.3

Table 2 continued. Seven-day weather synopsis (temperature (Tavg, °C), observed temperature difference (°C) from climate normal, rain (mm) and rain percent of climate normal (%) for observed (OBS) and climate normal (CN) values across the Canadian Prairies for the period of May 13-19, 2024.

Location	Tavg (OBS) (^{0}C)	Tavg (CN) (^{0}C)	Tavg OBS difference from Climate Normals (^{0} C)	Rain (OBS) (mm)	Rain (CN) (mm)	% Of Normal
Minnedosa	10.9	10.4	0.5	24.3	8.3	294.6
Morden	12.4	11.4	1.0	25.3	11.1	227.9
Namao	9.5	10.4	-0.9	23.6	9.3	254.0
Nipawin	10.8	9.6	1.2	27.0	7.3	369.3
North Battleford	9.9	10.2	-0.2	11.1	7.9	141.3
Oyen	10.2	10.9	-0.7	15.0	6.8	219.7
Peace River	7.9	10.1	-2.2	23.9	8.9	267.9
Portage La Prairie	11.8	11.0	0.8	39.3	8.6	455.5
Prince Albert	11.3	10.1	1.2	18.8	8.3	226.8
Red Deer	9.3	10.1	-0.8	8.8	10.3	85.2
Regina	11.3	11.5	-0.2	14.0	5.8	242.2
Roblin	10.1	9.1	1.0	20.8	7.9	262.1
Rosetown	10.7	11.3	-0.6	8.8	8.4	104.8
Saskatoon	11.2	11.1	0.2	7.6	8.0	94.4
Scott	9.6	10.7	-1.1	15.0	6.8	221.0
Steinbach	12.1	10.9	1.2	36.9	13.6	271.6
Swan River	10.4	8.6	1.8	12.9	8.0	161.4
Swift Current	11.1	10.9	0.2	19.3	7.4	259.6
Taber	11.2	11.5	-0.3	18.1	6.4	281.8
Tisdale	11.0	9.9	1.1	24.8	7.3	341.0
Valley View	8.1	9.7	-1.7	26.9	10.9	246.8
Vanguard	11.5	11.3	0.2	17.5	7.2	244.2
Vauxhall	11.9	12.1	-0.2	17.7	6.7	265.0
Vegreville	8.9	10.6	-1.7	17.7	10.0	177.2
Virden	11.4	10.7	0.7	17.7	7.2	244.9
Watrous	11.4	10.7	0.7	18.1	7.4	244.7
Weyburn	11.9	11.6	0.3	18.4	6.5	284.8
Winnipeg	12.0	10.9	1.1	40.6	11.0	369.2
Wynyard	10.5	10.2	0.3	11.6	6.9	166.4
Yorkton	10.6	10.3	0.3	8.0	8.0	99.0

Table 3. 30-day weather synopsis (temperature (Tavg, °C), observed temperature difference (°C) from climate normal, rain (mm) and rain percent of climate normal (%) for observed (OBS) and climate normal (CN) values across the Canadian Prairies for the period of April 20 – May 19, 2024.

Location	Tavg (OBS) (^{0}C)	Tavg (CN) (^{0}C)	Tavg OBS difference from Climate Normals (^{0} C)	Rain (OBS) (mm)	Rain (CN) (mm)	% Of Normal
Alsask	10.5	9.5	1.0	66.7	22.6	295.2
Assiniboia	9.9	8.5	1.4	77.7	28.2	275.4
Beaverlodge	8.0	7.6	0.3	35.6	21.7	164.1
Bonneyville	8.2	8.1	0.1	86.7	26.3	329.3
Brandon	9.7	8.5	1.1	108.0	41.2	262.0
Brooks	9.7	9.1	0.6	69.0	25.8	267.0
Calgary	8.0	7.7	0.3	50.6	32.1	157.5
Canora	9.1	7.8	1.3	41.7	27.2	153.4
Carman	10.1	9.1	1.0	72.9	41.0	177.7
Cartwright	9.4	8.6	0.8	102.7	41.2	249.3
Coronach	9.8	8.5	1.3	72.4	31.1	232.9
Dauphin	9.3	6.6	2.8	46.6	33.1	141.0
Dawson Creek	8.4	6.0	2.4	31.5	21.0	149.8
Drumheller	8.7	8.5	0.3	63.7	27.1	234.6
Edmonton	8.3	8.0	0.3	66.2	31.1	212.6
Elbow	9.9	8.8	1.0	90.4	25.3	357.9
Estevan	9.9	9.1	0.8	66.9	32.5	206.3
Fairview	8.4	7.8	0.6	30.6	20.4	150.3
Fort St. John	8.7	6.4	2.3	32.4	23.8	136.2
Fort Vermilion	8.9	6.2	2.7	61.2	19.0	321.4
Fox Valley	10.1	9.2	0.9	71.4	27.2	262.3
Grande Prairie	7.9	8.0	-0.1	37.6	22.4	168.3
Hanna	9.2	8.4	0.8	69.5	25.1	276.5
High Level	8.4	6.8	1.6	47.3	17.8	266.5
Hudson Bay	9.0	6.6	2.4	55.0	22.6	243.4
Kindersley	9.3	8.5	0.8	60.7	23.2	261.2
La Crete	8.8	6.9	1.9	37.2	16.9	220.3
Lacombe	8.2	7.5	0.7	63.3	32.6	194.2
Lethbridge	8.5	8.4	0.1	95.9	32.8	292.1
Lloydminster	8.2	7.9	0.3	76.3	25.7	296.5
Manning	8.5	7.1	1.4	34.6	22.4	154.6
Maple Creek	10.0	9.1	0.9	85.6	28.5	300.1
Mayerthorpe	8.5	7.8	0.7	50.3	29.1	172.9
Meadow Lake	8.5	6.9	1.6	75.8	24.1	314.6
Medicine Hat	9.7	9.2	0.5	103.6	26.6	389.2
Melfort	9.3	7.6	1.7	56.2	22.3	251.8
Melita	9.9	9.0	0.9	72.7	34.5	210.8
Melville	9.1	7.9	1.2	40.5	27.1	149.6

Table 3 continued. 30-day weather synopsis (temperature (Tavg, °C), observed temperature difference (°C) from climate normal, rain (mm) and rain percent of climate normal (%) for observed (OBS) and climate normal (CN) values across the Canadian Prairies for the period of April 20 – May 19, 2024.

Location	Tavg (OBS) (^{0}C)	Tavg (CN) (^{0}C)	Tavg OBS difference from Climate Normals (^{0} C)	Rain (OBS) (mm)	Rain (CN) (mm)	% Of Normal
Minnedosa	9.3	8.2	1.0	80.5	37.2	216.4
Morden	10.3	9.1	1.2	88.8	42.0	211.4
Namao	8.5	8.0	0.6	77.8	27.4	283.7
Nipawin	9.4	7.3	2.1	50.2	21.7	231.7
North Battleford	9.0	7.8	1.2	48.6	25.1	193.6
Oyen	9.3	8.4	0.9	81.8	21.0	389.8
Peace River	8.6	8.0	0.7	34.1	21.7	156.9
Portage La Prairie	10.0	8.6	1.4	81.9	39.0	210.3
Prince Albert	9.4	7.8	1.6	49.7	24.2	205.6
Red Deer	8.0	7.7	0.3	39.0	32.9	118.6
Regina	9.7	8.9	0.8	63.6	25.3	251.2
Roblin	9.0	6.9	2.1	58.6	30.6	191.9
Rosetown	9.4	8.9	0.6	64.8	24.5	264.3
Saskatoon	9.7	8.7	1.0	44.3	25.9	171.3
Scott	8.7	8.2	0.5	53.3	22.6	236.3
Steinbach	9.8	8.7	1.1	84.2	44.3	190.0
Swan River	9.4	6.3	3.1	42.4	33.6	126.1
Swift Current	9.8	8.4	1.4	71.4	27.0	264.8
Taber	8.8	9.0	-0.2	117.3	28.5	412.1
Tisdale	9.3	7.6	1.7	52.4	21.8	240.7
Valley View	8.2	7.6	0.6	43.1	24.9	173.1
Vanguard	10.0	8.7	1.3	63.8	26.3	243.1
Vauxhall	9.8	9.5	0.4	102.0	26.1	390.8
Vegreville	8.1	8.2	-0.2	85.2	27.8	307.0
Virden	9.7	8.6	1.1	68.1	34.1	199.6
Watrous	9.7	8.3	1.4	69.5	26.4	263.6
Weyburn	9.8	9.0	0.8	68.0	28.7	236.6
Winnipeg	10.2	8.6	1.6	73.4	37.9	193.9
Wynyard	9.2	7.8	1.4	61.5	25.5	240.8
Yorkton	9.3	8.0	1.2	35.2	28.8	122.3

Table 4. Growing season weather synopsis (temperature (Tavg, °C), observed temperature difference (°C) from climate normal, rain (mm) and rain percent of climate normal (%) for observed (OBS) and climate normal (CN) values across the Canadian Prairies for the period of April 1- May 19, 2024.

Location	Tavg (OBS) (^{0}C)	Tavg (CN) (^{0}C)	Tavg OBS difference from Climate Normals (^{0} C)	Rain (OBS) (mm)	Rain (CN) (mm)	% Of Normal
Alsask	8.7	7.6	1.0	87.2	28.5	305.7
Assiniboia	8.4	6.7	1.7	82.7	36.0	229.5
Beaverlodge	6.0	5.8	0.2	44.3	27.8	159.4
Bonneyville	6.7	6.0	0.8	93.3	35.9	259.9
Brandon	7.9	6.3	1.5	140.5	52.8	266.3
Brooks	7.9	7.4	0.5	98.9	33.5	295.3
Calgary	6.4	6.1	0.3	68.3	40.0	170.8
Canora	6.6	5.5	1.1	59.9	37.5	159.7
Carman	8.4	6.8	1.6	98.5	54.2	181.8
Cartwright	7.7	6.4	1.3	132.3	54.1	244.5
Coronach	8.4	6.6	1.8	74.3	40.3	184.7
Dauphin	7.1	4.3	2.8	82.8	41.9	197.5
Dawson Creek	6.3	4.2	2.1	42.1	28.7	146.7
Drumheller	7.0	6.7	0.3	81.0	34.4	235.2
Edmonton	6.6	6.1	0.5	73.1	40.8	179.2
Elbow	8.2	6.9	1.3	99.4	32.0	310.2
Estevan	8.1	7.0	1.1	80.3	43.9	183.0
Fairview	6.3	5.8	0.6	35.5	26.8	132.7
Fort St. John	6.5	4.5	2.1	41.2	31.0	132.8
Fort Vermilion	6.9	3.8	3.0	67.6	22.7	298.1
Fox Valley	8.4	7.4	1.0	97.3	34.7	280.5
Grande Prairie	5.9	6.1	-0.2	50.1	28.3	177.5
Hanna	7.5	6.6	0.9	88.0	32.3	272.2
High Level	6.1	4.4	1.7	60.9	21.7	280.7
Hudson Bay	6.9	4.2	2.7	89.2	31.6	282.4
Kindersley	7.8	6.5	1.2	86.3	31.6	273.2
La Crete	6.6	4.4	2.1	44.3	20.6	215.1
Lacombe	6.5	5.7	0.8	71.3	41.4	172.3
Lethbridge	7.4	6.9	0.5	126.6	45.4	278.6
Lloydminster	6.7	5.8	0.9	83.7	35.9	232.8
Manning	6.6	4.9	1.6	40.6	28.4	143.1
Maple Creek	8.4	7.4	1.0	117.2	35.9	326.4
Mayerthorpe	6.6	6.0	0.7	59.2	37.7	157.3
Meadow Lake	6.6	4.7	1.9	81.1	33.5	241.8
Medicine Hat	8.1	7.5	0.6	133.6	33.9	393.8
Melfort	7.2	5.2	2.0	86.5	30.7	282.0
Melita	8.0	6.9	1.2	91.3	46.0	198.5
Melville	6.9	5.7	1.3	51.6	37.6	137.3

Table 4 continued. Growing season weather synopsis (temperature (Tavg, °C), observed temperature difference (°C) from climate normal, rain (mm) and rain percent of climate normal (%) for observed (OBS) and climate normal (CN) values across the Canadian Prairies for the period of April 1- May 19, 2024.

Location	Tavg (OBS) (^{0}C)	Tavg (CN) (^{0}C)	Tavg OBS difference from Climate Normals (^{0} C)	Rain (OBS) (mm)	Rain (CN) (mm)	% Of Normal
Minnedosa	7.4	6.0	1.4	112.4	47.6	236.1
Morden	8.5	6.8	1.7	110.6	55.0	201.1
Namao	6.7	5.9	0.8	86.8	37.1	233.8
Nipawin	7.3	4.9	2.4	85.2	30.5	279.5
North Battleford	7.2	5.6	1.6	65.8	35.8	184.0
Oyen	7.6	6.5	1.2	90.3	25.8	349.6
Peace River	6.6	5.9	0.7	37.2	27.5	135.4
Portage La Prairie	8.0	6.3	1.7	106.7	50.9	209.7
Prince Albert	7.2	5.5	1.8	82.6	33.1	250.0
Red Deer	6.2	5.9	0.3	50.3	40.9	123.0
Regina	8.1	6.8	1.3	65.2	34.5	189.3
Roblin	6.6	4.5	2.1	93.3	40.7	229.1
Rosetown	7.7	6.9	0.9	86.9	33.5	258.9
Saskatoon	7.9	6.6	1.3	68.1	33.3	204.5
Scott	7.1	6.1	1.0	66.7	32.5	205.4
Steinbach	7.9	6.4	1.5	110.0	55.1	199.8
Swan River	7.3	4.0	3.2	82.7	44.8	184.5
Swift Current	8.2	6.6	1.6	82.3	33.6	244.6
Taber	7.5	7.4	0.1	143.3	39.1	366.3
Tisdale	7.2	5.2	2.0	85.9	30.2	284.6
Valley View	6.2	5.7	0.5	62.2	31.3	198.8
Vanguard	8.4	6.9	1.5	72.5	32.6	222.3
Vauxhall	8.2	7.8	0.4	130.2	34.3	379.3
Vegreville	6.5	6.2	0.4	87.1	37.6	231.7
Virden	7.6	6.4	1.3	93.8	44.1	212.6
Watrous	7.7	6.2	1.5	79.2	35.2	225.2
Weyburn	8.2	7.0	1.3	71.0	40.5	175.6
Winnipeg	8.3	6.4	1.9	104.2	48.3	215.8
Wynyard	7.0	5.5	1.5	83.4	33.7	247.4
Yorkton	6.9	5.8	1.1	47.4	39.3	120.4

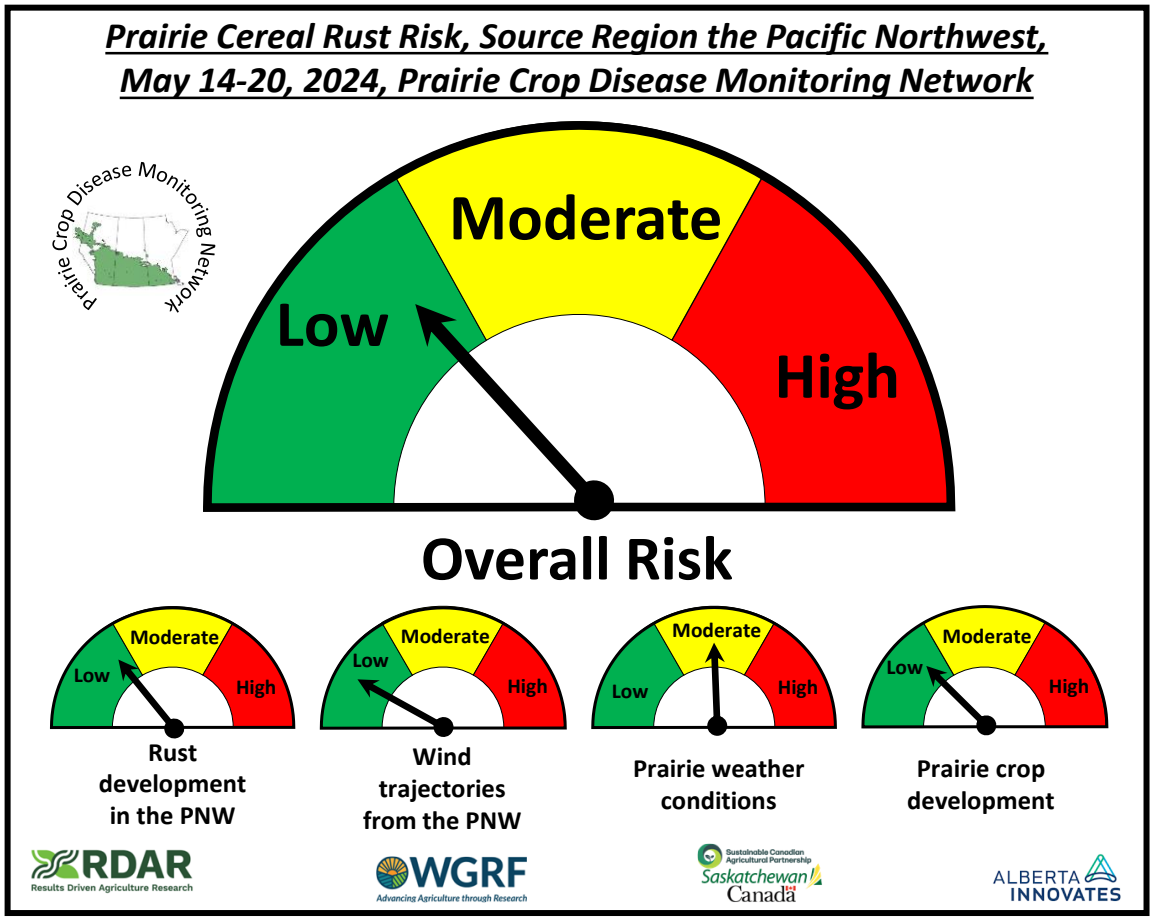

Figure 8. Prairie cereal risk speedometers for stripe rust from the Pacific Northwest, May 14-20, 2024.

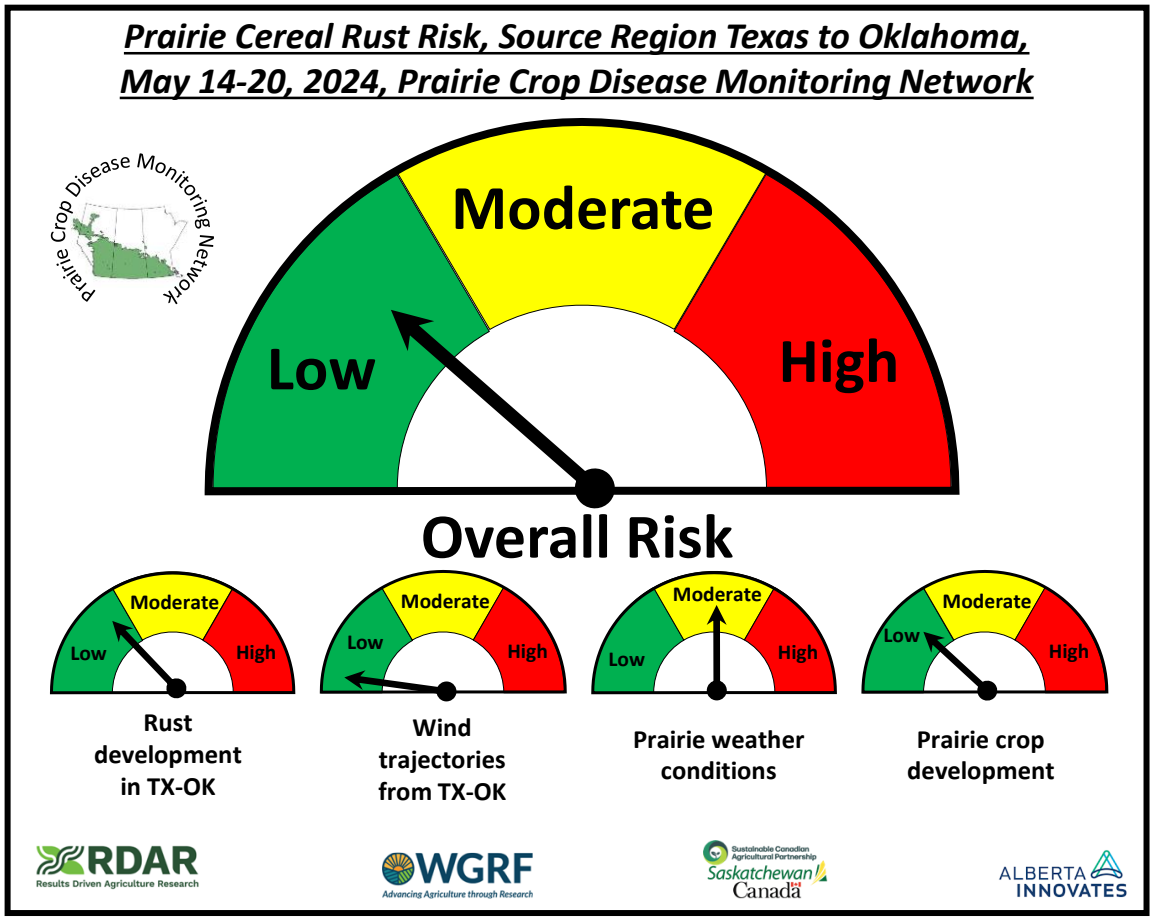

Figure 9. Prairie cereal risk speedometers for stripe/leaf rust from the Texas to Oklahoma region, May 14-20, 2024.

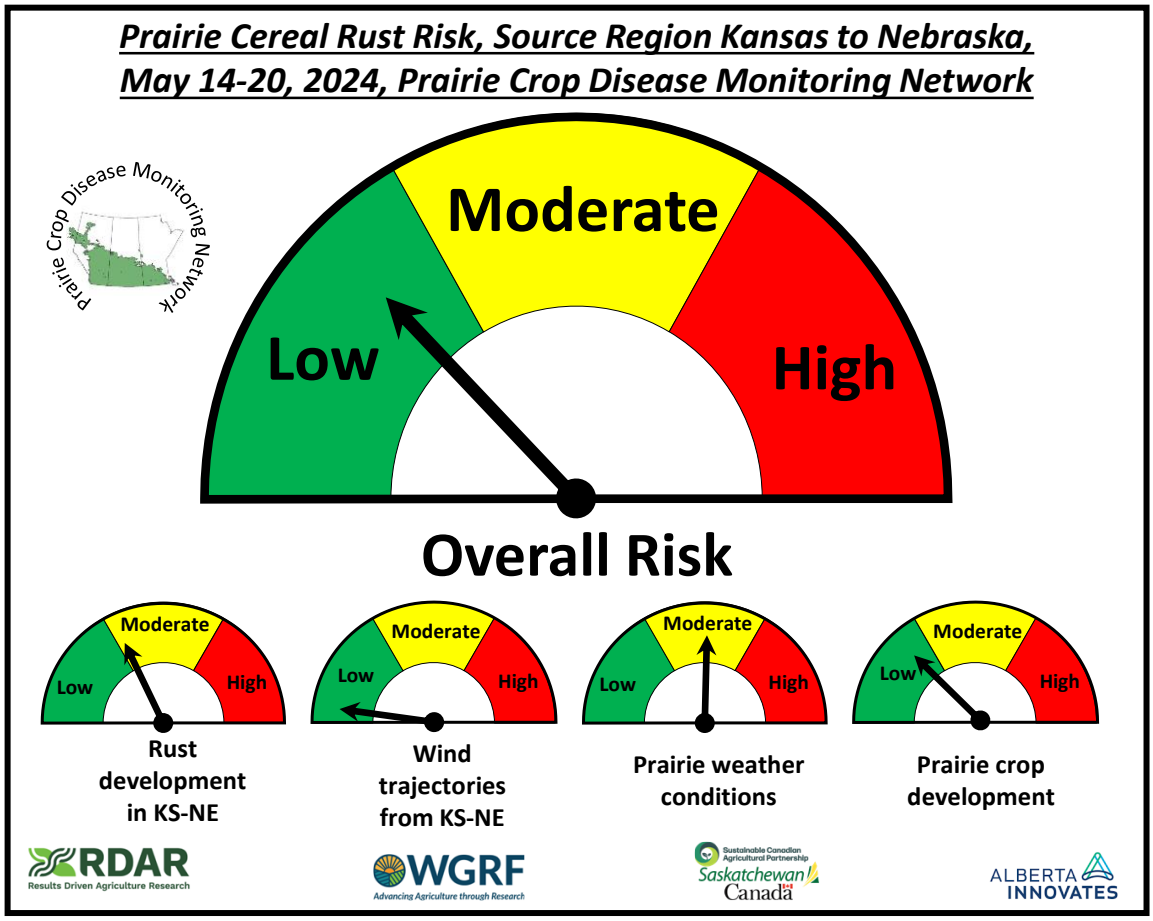

Figure 10. Prairie cereal risk speedometers for stripe/leaf rust from the Kansas/Nebraska region, May 14-20, 2024.