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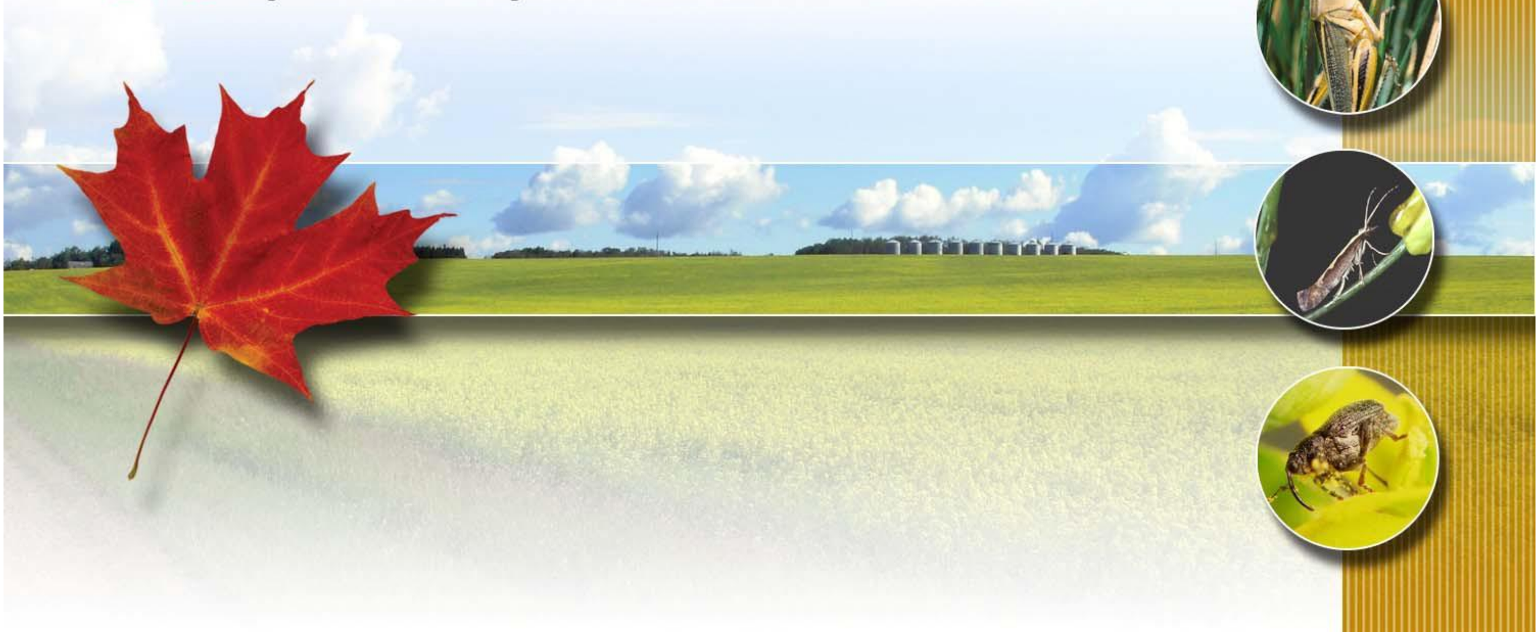

2019 Crop Variety Highlights

Melfort Research Farm

Scott Research Farm

Saskatoon Research Centre

Canada

Regional Testing of Cereal, Oilseed and Pulse Cultivars 2019
G. A. Ford and B. Hrynewich

Cultivars are tested regionally to determine their adaptation to the wide range of soil and climatic conditions in Saskatchewan. These tests are conducted at approximately 12 locations each year including two by Scott Research Farm staff (Scott and Glaslyn) and one at the Melfort Research Farm. Results form the basis of cultivar recommendations – yield data can help producers assess the performance of varieties in their area. However, data from a single location can be limited, particularly for new varieties. More comprehensive information is contained in the Saskatchewan Ministry of Agriculture publication, *Varieties of Grain Crops 2020.* Seed quantities for new varieties listed herein may be limited for 2020.

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Table 1. Growing Season Precipitation (mm) at Scott, Glaslyn and Melfort in 2019

Month	Scott	Glaslyn	Melfort
May	13	5*	19
June	98	48	87
July	108	128	73
August	18	21	31
September	42	37	43
October	7	1*	12
Total	**286**	**240**	**265**
Long Term Average	270	304	298

*Glaslyn weather station was put up on May 23 and taken down on October 12.

Table 2. Average Yields of Crop Species on Fallow at Scott, Glaslyn and Melfort (2015-2019)

		Scott		Glaslyn		Melfort	
Crop	**Cultivar**	**kg/ha**	**bu/ac**	**kg/ha**	**bu/ac**	**kg/ha**	**bu/ac**
Hard red spring wheat	Carberry	3469	52	4133	62	4325	64
CPS red wheat	SY Rowyn*	3748	56	4375	65	5249	78
Hard white spring wheat	AAC Cirrus*	3901	58	4347	65	4942	74
Soft white spring wheat	AAC Indus VB	4922	73	5671	84	6299	94
Northern hard red wheat	Elgin ND	4270	64	4562	68	5352	80
Durum	Strongfield	2985	44	.	.	4313	64
Barley – 2 row	AC Metcalfe	4616	86	5154	96	6026	112
Oat	CDC Dancer	4721	132	5172	144	7014	196
Flax	CDC Bethune	1876	30	2324	37	2690	43
Canary seed	CDC Bastia	1380	26	.	.	1713	32

* Less than 5 years of data

Table 3. Yield of Flax Cultivars at Scott, Glaslyn, and Melfort 2019

	2019 Yield (kg/ha)			Long-Term Average Yield (% of CDC Bethune)		
Cultivar	**Scott**	**Glaslyn**	**Melfort**	**Scott**	**Glaslyn**	**Melfort**
CDC Bethune	3447	2897	3822	100	100	100
AAC Bright	3410	2300	3694	107*	85*	94*
CDC Buryu	3482	2306	3386	107	96	87
CDC Dorado	3179	1851	3188	89*	73*	86*
CDC Glas	3702	2728	3958	110	98	104
AAC Marvelous	3840	2175	3924	111*	85*	101*
AAC Prairie Sunshine	3751	2522	3632	114*	93*	92*
CDC Rowland	4014	2976	3808	113*	103*	103*
Topaz	3472	2228	3858	106	87	92

* Less than 5 years of data

Table 4. Yield of Durum Cultivars at Scott and Melfort 2019

	2019 Yield (kg/ha)		Long-Term Average Yield (% of Strongfield)	
Cultivar	**Scott**	**Melfort**	**Scott**	**Melfort**
Strongfield	4760	4577	100	100
CDC Alloy	4724	5187	102	106
AAC Congress	5444	5098	111	109
CDC Credence	4804	5429	96*	109*
CDC Dynamic	4972	5143	93	105
AAC Grainland	4493	5390	94*	102*
CDC Precision	4911	5022	99	107
AAC Stronghold	4835	4748	99*	97*
AAC Succeed VB	4879	5076	96*	109*

* Less than 5 years of data

Table 5. Yield of Oat Cultivars at Scott, Glaslyn, and Melfort 2019

	2019 Yield (kg/ha)			Long-Term Average Yield (% of CDC Dancer)		
Cultivar	**Scott**	**Glaslyn**	**Melfort**	**Scott**	**Glaslyn**	**Melfort**
CDC Dancer	6396	7058	8221	100	100	100
CDC Arborg	7426	6264	8888	121*	103*	118*
CS Camden	7401	6836	8751	110	103	115
AAC Douglas	7502	8293	8282	117*	118*	101*
AC Morgan	7003	8776	9419	114*	115*	122*
CDC Morrison	6752	7125	6602	102*	98*	92*
ORe3541M	7118	6325	8073	105*	90*	98*
Ore3542M	6570	7082	7965	107*	95*	99*
Akina**	7601	8174	9202	108	110	115
Kara**	8285	8310	8458	112	109	117

* Less than 5 years of data

**These varieties are being tested for adaptability in western Canada.

Table 6. Yield of Spring Wheat Cultivars at Scott, Glaslyn, and Melfort 2019

	2019 Yield (kg/ha)			Long-Term Average Yield (% of Carberry)		
Cultivar	**Scott**	**Glaslyn**	**Melfort**	**Scott**	**Glaslyn**	**Melfort**
Canada Western Red Spring						
Carberry	5025	4657	4493	100	100	100
CDC Adamant VB	5186	5876	4911	107*	118*	108*
AAC Alida VB	4909	5493	4601	107*	114*	105*
Bolles	6161	5522	4439	123*	119*	99*
AAC Broadacres	5547	5496	4271	110*	118*	95*
SY Chert VB	5033	6151	5283	99*	125*	104*
Ellerslie	5838	.	4522	116*	.	101*
SY Gabbro	5961	5278	4832	120*	120*	106*
CDC Hughes VB	5512	5388	4920	108	103	110
Jake	5266	4756	5043	105*	102*	112*
CDC Landmark VB	5151	6175	5155	107	110	114
AAC Leroy VB	4983	5614	5089	99*	121*	113*
AAC Magnet	5523	4967	4596	110*	107*	102*
SY Obsidian	5605	5621	5085	114*	116*	106*
CDC Ortona	5186	5070	5088	104*	119*	111*
Parata	4184	4887	4124	88*	107*	97*
AAC Redberry	4846	5193	4519	100	106	107
AAC Redstar	5467	4955	4658	109*	106*	104*
Rednet	5093	5030	5289	101*	108*	118*
AAC Russell	5490	5802	4482	109*	125*	100*
SY Slate	5290	4841	4484	100	102	103
SY Sovite	5362	4703	4757	95*	106*	105*
AAC Starbuck VB	5633	5899	5452	113*	123*	115*
AAC Tisdale	4668	5091	3623	92*	112*	99*
SY Torach	4938	5363	4639	97*	116*	98*
Tracker	5686	5037	4740	113*	108*	105*
AAC Viewfield	5707	5329	4865	113	107	117
AAC Warman VB	5386	5576	4654	105*	123*	99*
AAC Wheatland VB	5268	5851	4707	106*	124*	106*
Canada Prairie Spring Red						
AAC Castle VB	6086	6379	5598	131*	123*	120*
AAC Crossfield	5273	6188	5410	118*	114*	114*
AAC Entice	4760	6267	5759	110*	114*	115*
AAC Goodwin	6127	6001	5074	119*	113*	118*
SY Rowyn	5138	5816	5271	112*	108*	113*
CDC Terrain	5789	5879	5364	120	114	123

Table 6 (cont). Yield of Spring Wheat Cultivars at Scott, Glaslyn, and Melfort 2019

	2019 Yield (kg/ha)			Long-Term Average Yield (% of Carberry)		
Cultivar	**Scott**	**Glaslyn**	**Melfort**	**Scott**	**Glaslyn**	**Melfort**
Canada Northern Hard Red						
AAC Concord	5138	4976	4672	104	111	109
CDC Cordon CLPlus VB	5320	5745	5170	111*	113*	113*
Elgin ND	6218	6123	5842	123	111	124
Faller	6374	6444	6367	122*	121*	131*
Prosper	6252	6383	6056	129*	116*	126*
Canada Western Soft White Spring						
AAC Indus VB	7155	7367	6183	142	138	146
AAC Paramount VB	5470	6301	5460	128	129	140
Canada Western Special Purpose						
Alderon	6746	6316	6638	145*	136*	145*
AAC Awesome VB	6496	7071	6886	147*	139*	153*
Charing VB	7348	6914	6016	143*	132*	143*
CDC Kinley	5253	5207	4508	102	107	108
Sparrow VB	7184	7064	6820	139*	136*	153*
CDC Throttle	6148	6669	5803	120	122	125
Canada Western Hard White Spring						
AAC Cirrus	4962	5420	4321	103*	114*	101*

* Less than 5 years of data

Table 7. Yield of Barley Cultivars at Scott, Glaslyn, and Melfort 2019

	2019 Yield (kg/ha)			Long-Term Average Yield (% of AC Metcalfe)		
Cultivar	**Scott**	**Glaslyn**	**Melfort**	**Scott**	**Glaslyn**	**Melfort**
2 row barley						
AC Metcalfe	6609	6071	5240	100	100	100
Altorado	7699	7314	7248	117	118	116
CDC Ascent	6651	6728	4755	105*	101*	93*
AAC Connect	6723	6451	6030	108*	112*	114*
CDC Copeland	6950	7196	5866	109*	122*	114*
CDC Copper	7918	7369	6364	125*	124*	126*
CDC Fraser	8086	6976	6571	116	116	115
CDC Goldstar	7291	7108	6536	114*	117*	108*
Lowe	7996	7282	6753	123*	118*	117*
Sirish	6715	7070	6132	106*	108*	109*
AAC Synergy	8073	7590	6120	116*	118*	112*
6 row barley						
AB Advantage	8971	7070	6100	131*	122*	121*
AB Cattlelac	7490	7131	5207	113*	120*	112*

* Less than 5 years of data

Table 8. Yield of Lentil Cultivars at Scott and Melfort 2019

Cultivar	Long-Term Average Yield (% of CDC Maxim CL) Scott	Melfort
Small Red		
CDC Maxim (CL)	100	100
CDC Carmine	111	106
CDC Cherie	109	106
CDC Coral	110	103
CDC Dazil (CL)	97	92
CDC Imax (CL)	92	78
CDC Impact (CL)	80	76
CDC Impulse (CL)	107	100
CDC Karim (CL)	102	100
CDC Nimble (CL)	109	107
CDC Proclaim (CL)	105	100
CDC Red Rider	95	85
CDC Redberry	97	99
CDC Redcliff	107	103
CDC Redcoat	105	93
CDC Redmoon	114	104
CDC Scarlet	105	102
CDC Simmie (CL)	109	103
Extra Small Red		
CDC Imp (CL)	95	93
CDC Impala (CL)	84	82
CDC Imperial (CL)	84	79
CDC Redbow	102	99
CDC Rosebud	100	99
CDC Rosie	90	93
CDC Roxy	103	97
Large Red		
CDC KR-1	108	87
CDC KR-2 (CL)	104	90
CDC Sublime	116	104
Small Green		
CDC Imvinsible (CL)	94	81
CDC Kermit	105	95
CDC Viceroy	97	98
Extra Small Green		
CDC Asterix	96	91
Medium Green		
CDC Imigreen (CL)	78	71
CDC Impress (CL)	87	71
CDC Meteor	102	89
CDC Richlea	93	80

Table 8 (cont). Yield of Lentil Cultivars at Scott and Melfort 2019

Cultivar	Long-Term Average Yield (% of CDC Maxim CL)	
	Scott	Melfort
Large Green		
CDC Greenland	89	70
CDC Greenstar	98	80
CDC Impower (CL)	82	67
CDC Lima (CL)	92	85
CDC Sovereign	83	77
French Green		
CDC Marble	103	96
CDC Peridot	84	94
Green Cotyledon		
CDC QG-1	80	65
CDC QG-2	89	88
CDC QG-3 (CL)	92	66
CDC QG-4 (CL)	92	90
Spanish Brown		
CDC SB-3 (CL)	90	87
CDC SB-4 (CL)	102	101

Table 9. Yield of Field Pea Cultivars at Scott and Melfort 2019

Cultivar	Long-Term Average Yield (% of CDC Amarillo)	
	Scott	Melfort
Yellow		
CDC Amarillo	100	100
Abarth	93	90
CDC Aberdeen	107	103
Agassiz	98	94
AAC Ardill	102	99
AAC Asher	103	100
CDC Athabasca	93	97
CDC Canary	98	98
AAC Carver	102	100
AAC Chrome	105	101
AAC Delhi	104	100
CDC Golden	92	83
Hyline	94	95
CDC Inca	105	99
AAC Lacombe	96	100
CDC Lewochko	103	103
CDC Meadow	93	89
AAC Profit	101	110
CDC Saffron	98	91
CDC Spectrum	103	101

Table 9 (cont). Yield of Field Pea Cultivars at Scott and Melfort 2019

Cultivar	Long-Term Average Yield (% of CDC Amarillo)	
	Scott	Melfort
Green		
Blueman	92	90
AAC Comfort	92	98
Cooper	89	80
CDC Forest	101	101
CDC Greenwater	100	93
CDC Limerick	96	90
CDC Patrick	87	86
CDC Pluto	92	84
AAC Radius	77	77
CDC Raezer	82	80
CDC Spruce	95	99
CDC Striker	82	80
CDC Tetris	88	91
Red		
Redbat 8	92	85
Redbat 88	91	92
Maple		
CDC Acer	84	73
CDC Blazer	99	98
AAC Liscard	90	88
CDC Mosaic	81	74
DUN		
CDC Dakota	101	98
Forage		
CDC Horizon	88	78
CDC Jasper	80	81

Insect Pest Updates

Bertha Armyworm in Western Canada in 2019

M. Vankosky, O. Olfert, J. Gavloski, S. Meers, J. Tansey, S. Hladun, J. Otani

Populations of bertha armyworm (*Mamestra configurata*) are monitored annually across the prairie provinces using pheromone traps. The traps are maintained by growers, agronomists, and other cooperators, with additional traps monitored by the provincial entomologists. Provincial agriculture department staff provide support and guidance to cooperators during the growing season and compile and share data within each province during the growing season. The protocol used to monitor bertha armyworm using pheromone traps was updated in spring 2019 and is available on the Prairie Pest Monitoring Network Blog (prairiepestmonitoring.blogspot.com). The monitoring program is used as an early warning system to alert growers when regional population densities approach economic thresholds.

During the growing season, each province reported cumulative trap captures on their websites, often in near-real-time, to provide information to growers and agronomists to guide in-field scouting. Cumulative trap captures below 600 are considered to represent low risk to crop production. However, actual larval density within the crop is usually sporadic and there is usually considerable variation in larval population density within and between fields. Furthermore, site-specific interpretation of trap counts is difficult, because pheromone traps only capture male moths, while female moths select where eggs are laid. In-field scouting for bertha armyworm larvae, following the protocol available from the Prairie Pest Monitoring Network, is important for accurate population density estimates at the local (*i.e.*, field) level.

The amount of damage caused by bertha armyworm depends on several factors, including larval density, life stage of the insect and of the host plant, and temperature. Monitoring for bertha armyworm larvae should start within two weeks of peak trap catches and should continue until the crop is sprayed or swathed. An economic threshold for bertha armyworm is available and should be used to determine when to spray individual fields. Bertha armyworm populations can be controlled by abiotic factors (*e.g.*, unfavorable weather) and biotic factors (e.g., parasitoids, predators, and disease). The effects of these natural factors result in cyclic outbreaks that have generally occurred on an 8 to 10 year cycle, on a regional basis. Localized outbreaks may also occur, where populations increase, peak, and decrease over a three year period. In the past, outbreaks in Alberta have followed outbreaks in Manitoba and Saskatchewan. The last extensive regional outbreak occurred in 1994-1996.

Bertha armyworm populations were low in Manitoba in 2019, except around Swan River (Figure 1). Similarly, most traps located in Saskatchewan reported low trap captures in 2019, except one area east of Regina (RM 125). In Alberta, we observed considerable variation in bertha armyworm populations across the province, with some regions reporting very high numbers. Bertha armyworm were monitored at 323 locations in Alberta in 2019. Cumulative trap captures exceeded 1500 per trap in the Peace River Region, where insecticide application occurred late in the growing season. Other regions of the province reported trap captures in excess of 600 adults per trap, including Parkland, Sturgeon, Vulcan, Newell, and Wheatland Counties.

Funding for this survey was provided by the Canadian Agricultural Partnership Integrated Crop Agronomy Cluster (including: Agriculture & Agri-Food Canada, Western Grains Research Foundation, SaskWheat, Manitoba Wheat and Barley Growers Association, Alberta Wheat Commission, SaskPulse, Manitoba Canola Growers, Prairie Oat Growers Association, SaskCanola, and Manitoba Pulse and Soybean Growers). The network of pheromone traps was implemented and monitored by Alberta Agriculture & Forestry, Saskatchewan Ministry of Agriculture, Manitoba Agriculture, and Agriculture & Agri-Food Canada (AAFC). The map was prepared by AAFC-Saskatoon.

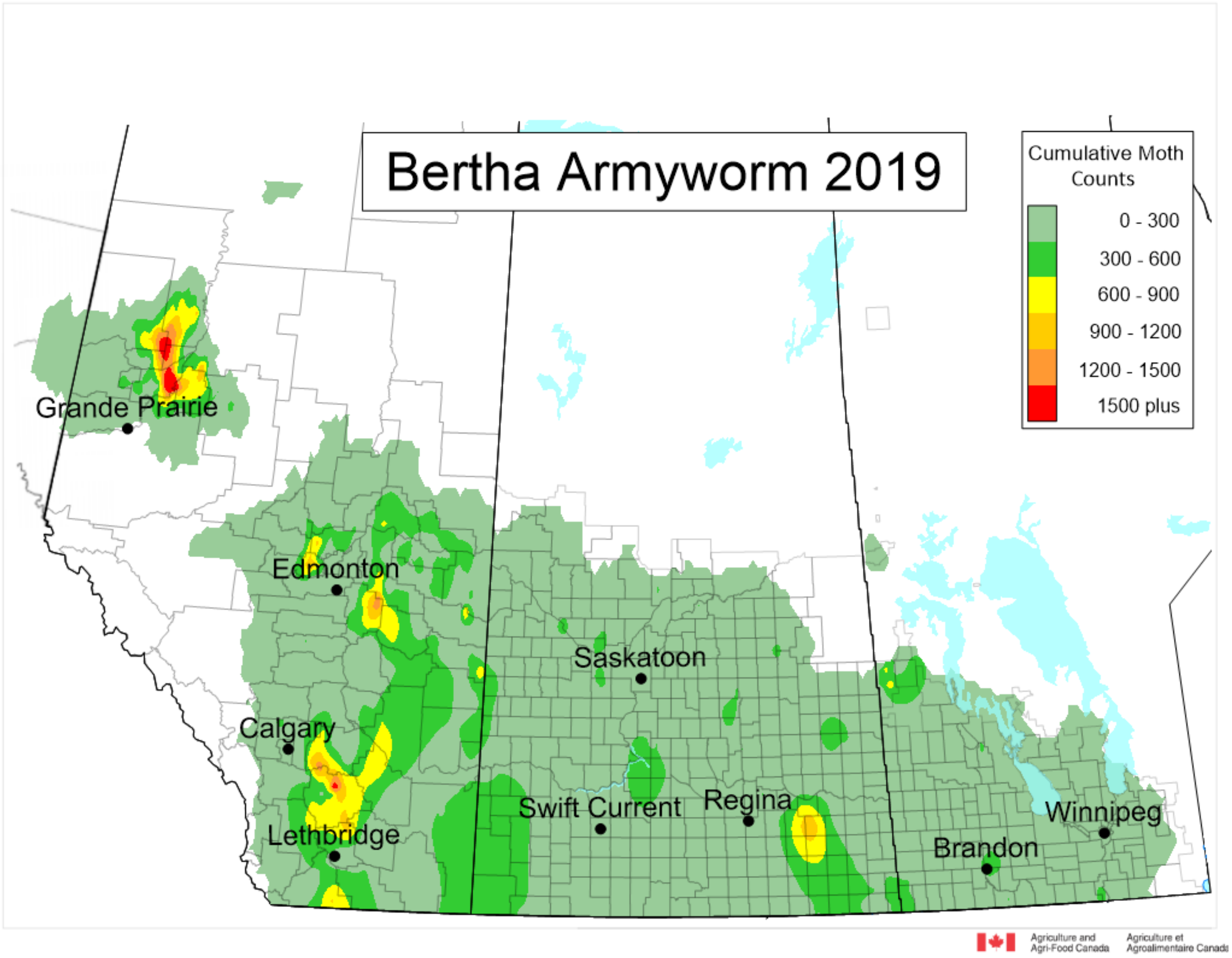

Figure 1. The cumulative trap catch of adult male bertha armyworm (*Mamestra configurata*) in pheromone-baited traps across the prairies in 2019.

The 2020 Prairie Grasshopper Forecast

M. Vankosky, O. Olfert, J. Tansey, J. Gavloski, S. Meers, D. Giffen, J. Otani

The grasshopper forecast is based on estimates of adult grasshopper density made in the fall of the previous year and on weather and biotic factors that affect grasshopper development and survival. The survey conducted in the fall estimates the number of adult grasshoppers capable of producing eggs before winter. Factors that lead to increased grasshopper populations include warm and dry conditions in late summer and fall; these encourage mating, egg laying, and egg development. Warm and dry conditions in the spring increase the survival of grasshopper hatchlings and the risk of crop damage. Actual levels of infestation in field crops may differ from those predicted in Figure 2 because of regional variation in weather conditions and the grasshopper species present.

Weather conditions in 2017 and 2018 were ideal for grasshoppers, but crop risk associated with grasshoppers was predicted to be low in 2019. We expect that very wet conditions across the prairies in fall 2016 reduced egg laying activity that year, and that grasshopper populations are still recovering. In 2019, some regions of the prairies did see increasing population densities, although these were quite localized and very patchy. The forecast for 2020 suggests that some parts of the prairies will be at higher risk of grasshopper damage compared to forecasts from the last two years. For example, areas around Winnipeg, Brandon, Kindersley, and Lethbridge are at risk of light to moderate grasshopper damage in 2020. Relatively high grasshopper populations were detected along the northern range of agricultural production in Alberta, including the Peace River Region, in 2019. Growers in these regions should be prepared to scout for grasshoppers in 2020, but may find lower than expected populations depending on the species of *Melanoplus* that were observed in 2019 (*i.e.*, our forecast is based on the life history of *M. sanguinipes* and may not be accurate for other *Melanoplus* species).

Female grasshoppers tend to lay their eggs along field margins and in ditches. Thus, field margins, roadsides, and crops grown on stubble should be watched closely when grasshopper hatching begins in the spring. The action threshold for most crops occurs when grasshopper populations reach 8-12 grasshoppers/m^2. The action threshold in lentils is much lower (>2 grasshoppers/m^2) at the flowering and pod stage, as grasshoppers cause direct yield loss at this plant stage. For example, two-striped grasshoppers feed preferentially on lentil pods, causing direct and significant yield loss at low population densities. If insecticides are applied to control grasshoppers, they should be applied to reduce their impact on beneficial insects (*e.g.*, pollinators, predatory beetles, and parasitoids of other insects) and on environmentally sensitive areas (*e.g.*, wetlands that provide other important ecosystem services).

A protocol for grasshopper scouting is available on the Prairie Pest Monitoring Network Blog. The developmental and risk status of grasshopper populations across the Prairie region will be available from the provinces and from the Prairie Pest Monitoring Network as the 2020 growing season progresses.

Funding for this survey was provided by the Canadian Agricultural Partnership Integrated Crop Agronomy Cluster (including: Agriculture & Agri-Food Canada, Western Grains Research Foundation, SaskWheat, Manitoba Wheat and Barley Growers Association, Alberta Wheat Commission, SaskPulse, Manitoba Canola Growers, Prairie Oat Growers Association, SaskCanola, and Manitoba Pulse and Soybean Growers). The survey was implemented and conducted by Alberta Agriculture & Forestry, Saskatchewan Ministry of Agriculture, Saskatchewan Crop Insurance Corporation, Manitoba Agriculture, and Agriculture & Agri-Food Canada (AAFC). The map was prepared by AAFC-Saskatoon.

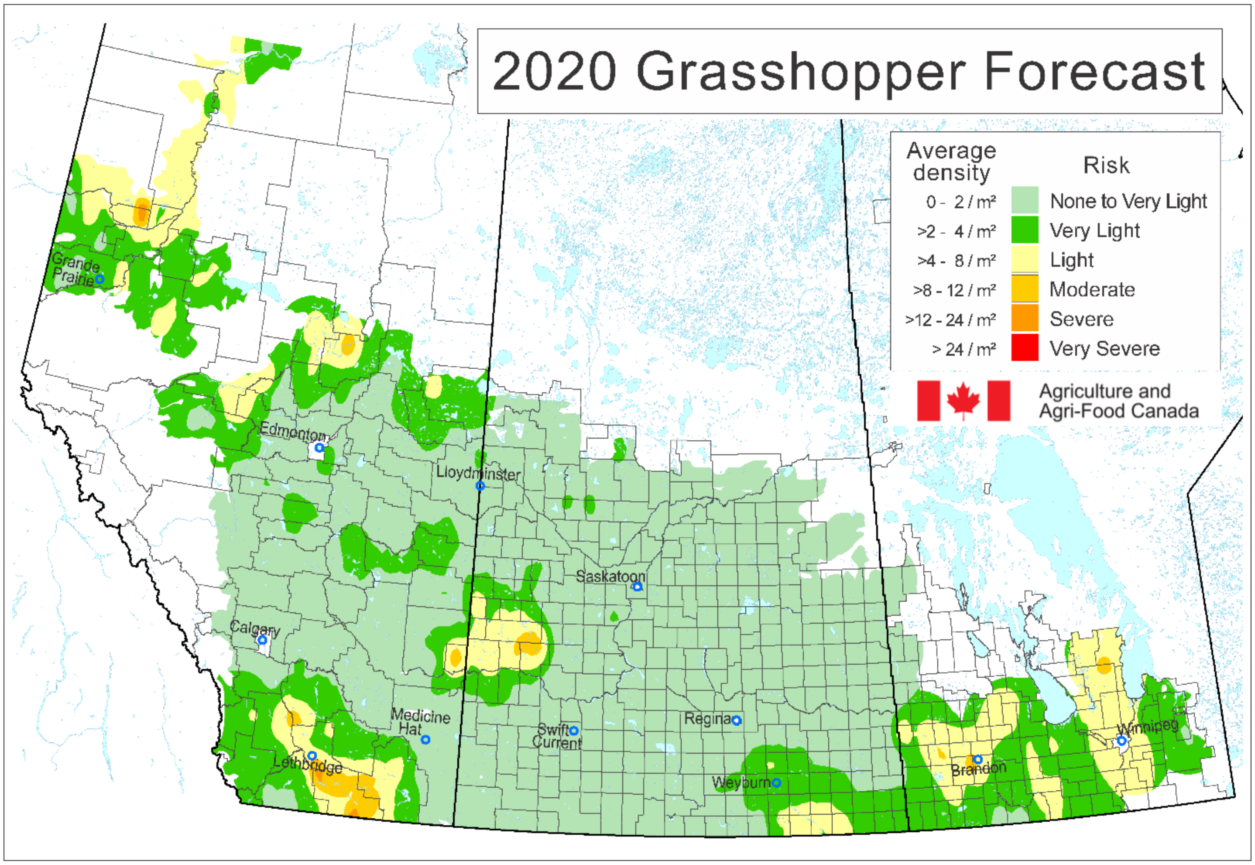

Figure 2. The potential risk due to grasshopper populations in 2020 based on a fall survey of adult grasshoppers across the prairie provinces in 2019.

Wheat Midge Forecast in Saskatchewan and Alberta for 2020

M. Vankosky, O. Olfert, S. Meers, J. Tansey, S. Hladun, J. Otani

The risk of wheat midge (*Sitodiplosis mosellana*) infestation in 2020 is estimated based on the number of non-parasitized wheat midge larval cocoons in soil samples collected during the fall wheat midge survey conducted in 2019. A number of factors in addition to parasitism influence the overwintering success of larval wheat midge. However, the forecast based on non-parasitized larvae provides a general picture of existing densities and the potential for damage in 2020. Weather conditions (especially precipitation levels) in spring 2020 will further influence the extent and timing of wheat midge emergence during the growing season.

There are approximately 5 and 14 areas at risk of economic damage due to wheat midge in 2020 in Alberta and Saskatchewan, respectively (600 midge/m^2 or greater). The forecast map is provided in Figure 3. The potential risk in 2020 is greater than forecast in 2019. This is likely due to the timing of spring rain in June 2019 that promoted larval development and subsequent adult emergence, and due to wet and cool conditions that persisted across most of Alberta and Saskatchewan during the 2019 growing season.

Similar to 2019, the risk of crop damage associated with wheat midge is relatively low in the Peace River Region in 2020. However, due to some developmental differences in populations from the Peace compared to other parts of the prairies, care should be taken when interpreting this forecast in the Peace River Region.

Although the incidence of wheat midge population densities are expected to be variable across Alberta and Saskatchewan in 2020, all areas where wheat midge are active during the growing season are susceptible to crop damage. This is because wheat midge larval feeding affects grain yield and quality. Growers in all areas with historic wheat midge populations should monitor their wheat fields during the susceptible period of crop development (*i.e.*, emergence of the wheat head from the boot until flowering) and when adult midge are active.

If adult midge density is equal to one midge per four or five wheat heads between emergence of the wheat heads and flowering (anthesis stage), an insecticide application may be appropriate to protect wheat kernels from larval feeding and damage. By the anthesis stage, wheat is resistant to larval damage and insecticides are not cost effective as any larvae present will have already caused damage. Larvae that hatch from eggs laid late in wheat development will not cause significant damage. Avoiding insecticide application after the anthesis stage will help protect populations of natural enemies in field crops, including parasitoids of wheat midge, and of other pests. Parasitism by a small parasitoid wasp (*Macroglenes penetrans*) can keep wheat midge populations from exceeding the economic threshold.

In spring 2020, the Prairie Pest Monitoring Network will use phenology models and weather conditions (precipitation and growing degree days) to model the expected emergence of wheat midge adults. Updates of current conditions and wheat midge emergence will be provided during the growing season.

Surveys of wheat midge larval cocoons were conducted in 2019 by Sharon Nowlan (SK) and by Alberta Agriculture & Forestry. The survey was funded by Saskatchewan Crop Insurance Corporation, Saskatchewan Wheat Development Commission, and Alberta Agriculture & Forestry. Prairie Pest Monitoring Network activity related to this survey was funded by the Canadian Agricultural Partnership Integrated Crop Agronomy Cluster. The forecast map was prepared by AAFC-Saskatoon.

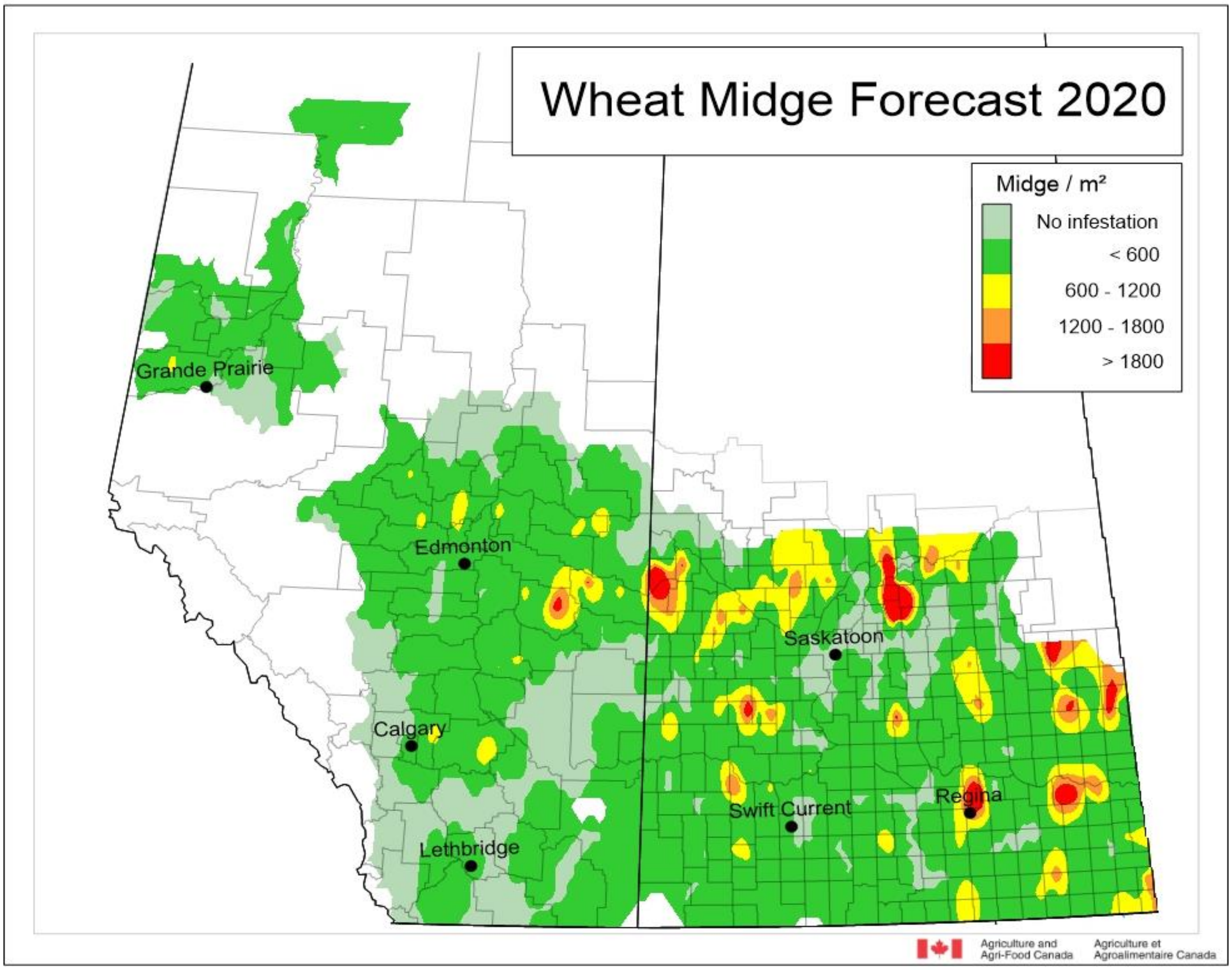

Figure 3. The forecasted distribution and risk associated with wheat midge (*Sitodiplosis mosellana*) in 2020 based on a survey of wheat midge larvae conducted in fall 2019 in Saskatchewan and Alberta.

Cabbage Seedpod Weevil in Alberta and Saskatchewan in 2019

M. Vankosky, O. Olfert, S. Meers, J. Tansey, S. Hladun, J. Otani

Populations of cabbage seedpod weevil (*Ceutorhynchus obstrictus*) were very low north of the Trans-Canada Highway (Highway 1) in both Alberta and Saskatchewan in 2019 (Figure 4). No cabbage seedpod weevils were found in sweep samples collected in the Peace River Region of Alberta or British Columbia. Adult weevils were detected in sweep samples collected in fields in Barrhead County in 2019. This population, if established and substantial, could become a source population for weevils moving north into the Peace River Region and highlights the importance of this survey for recording the geographic expansion of this pest. South of Highway 1, the area with population densities greater than 4-9 weevils per sweep contracted compared to 2018, although some fields with particularly high population densities were detected in the Lethbridge and Medicine Hat areas.

In 2020, Agriculture & Agri-Food Canada and the Saskatchewan Ministry of Agriculture surveyed 323 randomly selected *Brassica* sp. fields, with three fields selected per RM in all transects surveyed, except in the southwest corner of the province. Of the 323 fields surveyed, only nine had 20 or more weevils per 25 sweeps; the field with the greatest weevil density had 68 weevils in 25 sweeps (2.72 weevils per sweep). Over 150 fields of the 323 fields sampled had no cabbage seedpod weevils detected using the sweep sampling protocol.

Cabbage seedpod weevil damage their host crops (Polish and Argentine canola, brown mustard) when adult weevils feed on leaves, flowers, and buds (resulting in bud-blasting). Later in the growing season, adult feeding by new generation weevils can cause damage to the pods, which may contribute to increased yield loss due to pod shatter at harvest. Larvae directly reduce yield by feeding on developing seeds inside pods. Once larval development is complete, the larvae chew exit holes in the pods before dropping to the soil to pupate. The exit holes are a source of indirect damage, as these increase the incidence of pod shatter and can facilitate secondary fungal infection of the pods. During the survey, fields of *Brassica napus, B. alba*, and *B. juncea* may have been surveyed, as all are suitable host crops and fields are selected randomly for the survey.

To protect crops from cabbage seedpod weevil damage, monitor canola and brown mustard fields on a regular basis from the bud stage until the end of flowering. The protocol for monitoring cabbage seedpod weevil is available on the Prairie Pest Monitoring Network Blog. Accurate monitoring requires that sweep samples be collected from multiple locations within a field, with accuracy increasing as the sample size increases. To avoid overestimation of weevil populations, sweep samples should be taken from the interior of the field. The nominal economic threshold for cabbage seedpod weevil is 2.5 to 4 adult weevils per sweep. Insecticides are registered for cabbage seedpod weevil, please refer to the most recent Crop Protection Guide for your province.

Surveys were conducted by Alberta Agriculture & Forestry, Saskatchewan Ministry of Agriculture, and Agriculture & Agri-Food Canada (AAFC). Funding for this survey was provided by the Canadian Agricultural Partnership Integrated Crop Agronomy Cluster (including: AAFC, Western Grains Research Foundation, SaskWheat, Manitoba Wheat and Barley Growers Association, Alberta Wheat Commission, SaskPulse, Manitoba Canola Growers, Prairie Oat Growers Association, SaskCanola, and Manitoba Pulse and Soybean Growers). The distribution map was prepared by AAFC-Saskatoon.

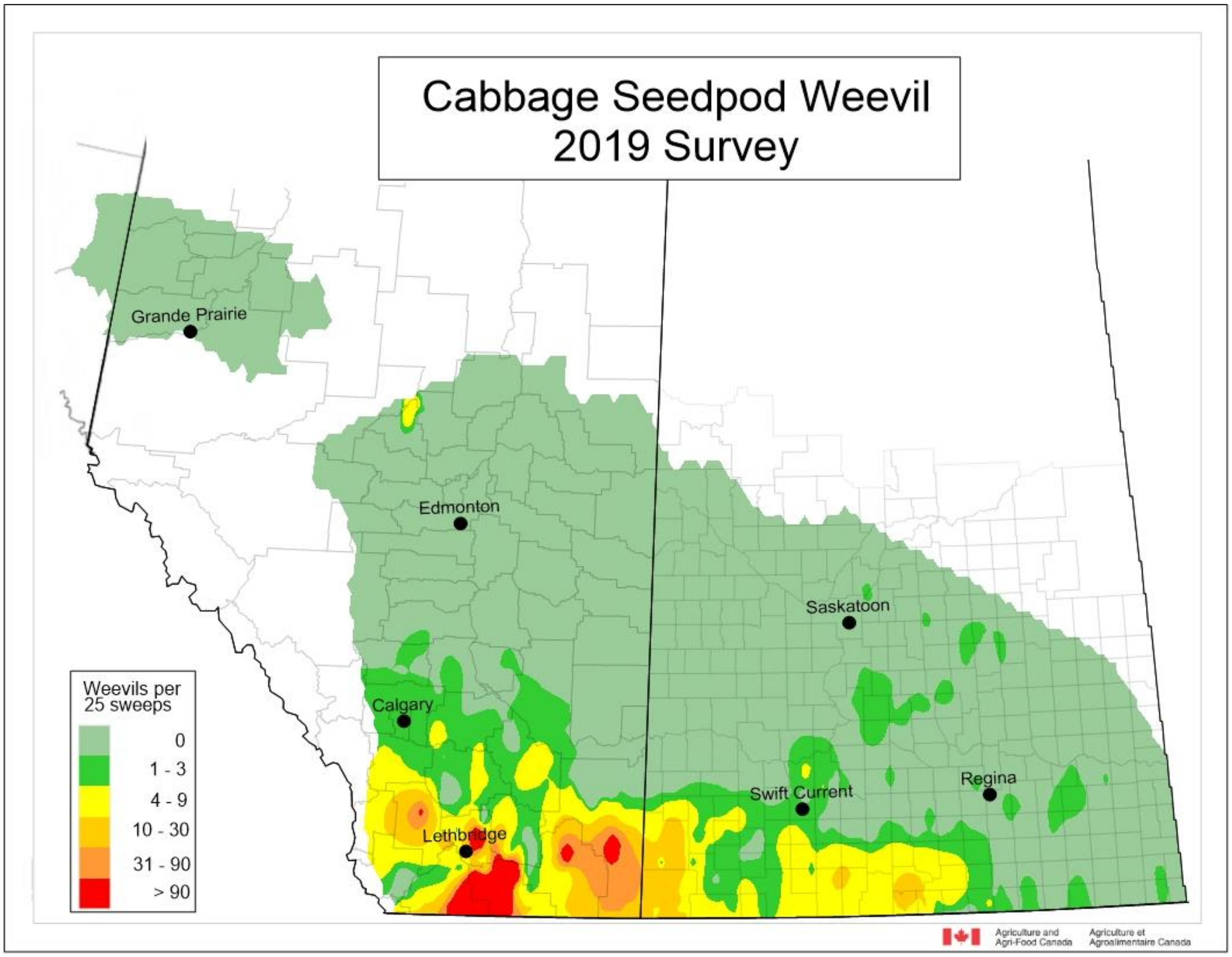

Figure 4. Cabbage seedpod weevil (*Ceutorhynchus obstrictus*) distribution in Saskatchewan and Alberta based on a sweep net survey conducted in randomly selected *Brassica* sp. fields in 2019.

Distribution of Wheat Stem Sawfly in Alberta in 2019

M. Vankosky, S. Meers, H. Carcamo, D. Giffen, O. Olfert

Wheat stem sawfly (*Cephus cinctus*) was surveyed in southern Alberta in 2019 by counting the number of stems cut by wheat stem sawfly larvae along the edges of wheat fields (Figure 5). Fields ranged in damage severity levels from very low to high. Fields with moderate to high levels of damage were observed in Vulcan, Wheatland, Lethbridge, and Willow Creek counties, as well as the counties of Wagner and Forty Mile. The level of damage was lower south of Oyen in 2019 compared to 2018. Although the areas with the highest population densities have shifted slightly between years, populations continue to increase compared to population densities observed between 2011 and 2017. Reduced populations between 2011 and 2017 were largely attributed to planting of solid stem wheat varieties and parasitism. Solid stem varieties continue to be popular in southern Alberta and there is no clear evidence that parasitism levels are changing, thus it is unclear why wheat stem sawfly populations have been increasing over the past two years.

The wheat stem sawfly is native to the prairies, but is considered a pest when it attacks cereal crops such as wheat. Populations of wheat stem sawfly increased quickly as wheat gained in popularity; solid stem wheat varieties have been integral in maintaining wheat as a profitable crop and reducing wheat stem sawfly pest pressure. Adult wheat stem sawflies are weak fliers; their dispersal improves in warm, calm, sunny weather conditions following spring rains. However, very wet conditions hinder population growth, as does parasitism. Cultivated cereals including spring wheat and durum wheat are preferred hosts of wheat stem sawfly. They can also utilize other cereal grasses as developmental hosts, but pose no threat to broadleaf crops.

Damage resulting from sawfly feeding and development inside the stem contributes to economic losses via reduced yield, reduced quality, and reduced ability to harvest the crop when plants lodge before they can be swathed or combined. Because sawflies tend to be weak fliers, damage levels are often highest along the field margins. However, studies have shown that adult sawflies are not confined to the crop edges and may be more prevalent within 20 m of the crop edge. When entire fields are affected, damage levels greater than 50% have been recorded. No insecticides are registered for management of wheat stem sawfly. Management tactics rely on cultural and agronomic practices, as well as biological control. Resistant cultivars with solid stems are the most effective management option in areas where wheat stem sawfly occur consistently. Producers are generally advised to consider alternative crops or preventative strategies when damage levels in the previous year’s crop range from 10 to 15%.

The survey was coordinated and conducted by Alberta Agriculture & Forestry and their partners. The distribution map was prepared by AAFC-Saskatoon.

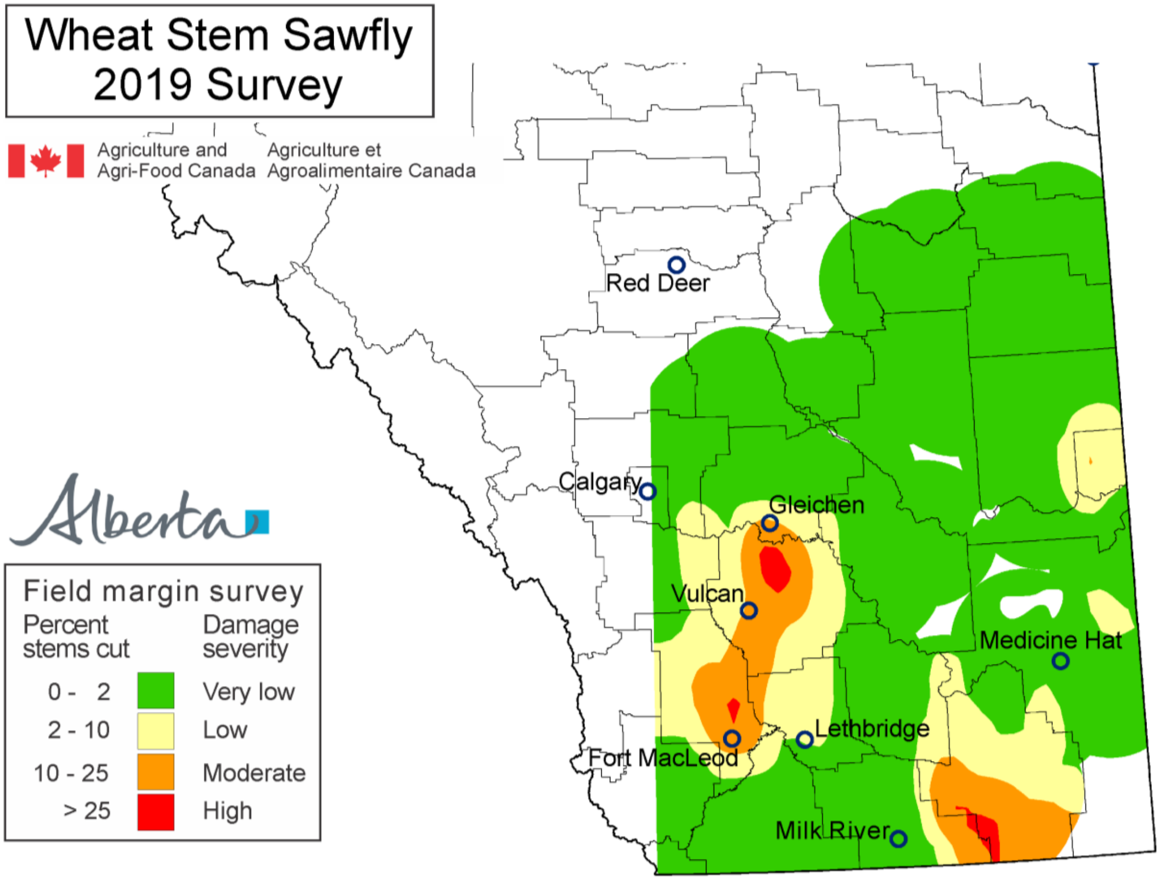

Figure 5. Wheat stem sawfly (*Cephus cinctus*) distribution in Alberta in 2019 based on results of a survey of cut stems in wheat fields.

Distribution of Pea Leaf Weevil in Saskatchewan and Alberta in 2019

M. Vankosky, J. Tansey, S. Meers, S. Hladun, O. Olfert

The pea leaf weevil (*Sitona lineatus*) is an invasive species in Canada that is now established in Alberta and Saskatchewan, where its populations impact the production of field pea. Faba bean is also a primary host of pea leaf weevil; establishment of this relatively new crop in western Canada is challenged by this pest. Pea leaf weevil was first detected on the prairies near Lethbridge in the late 1990s and in southern Saskatchewan in 2007. Adult pea leaf weevils consume the foliage of field pea and faba bean plants, beginning in the spring, resulting in 'u' shaped notches along the margins of the leaves. The survey is conducted annually in the spring when field pea plants range in size between two and four pairs of leaves by counting the number of feeding notches. The number of notches is used to estimate population density, based on the expectation that increasing levels of damage are indicative of increasing population density.

Since becoming established, the range of pea leaf weevil in western Canada has expanded east and north. The pea leaf weevil was confirmed in the Peace River Region a few years ago, and was found throughout the region in 2019 (Figure 6). Pea leaf weevils were collected and their identity confirmed in northwest Manitoba for the first time in 2019.

Pea leaf weevil populations in Saskatchewan were quite low in 2019 (Figure 6), similar to observations from the survey in 2018. Some fields in north eastern Saskatchewan had an average of one to three notches per plant. These fields seem to correspond to parts of the province that have received consistent precipitation levels throughout the growing season since 2017.

In Alberta, weevil populations were concentrated around Lethbridge in the south and Edmonton in the central part of the province (Figure 6). Populations in southern Alberta remain low (3 – 27 notches per plant on average), especially compared to outbreak years (*e.g*., 2007). In the Edmonton area and north to the edge of the agricultural range, some fields with damage levels in excess of 27 notches per plant were observed in 2019. Like the Yorkton area of Saskatchewan, the Edmonton area has been wetter than other parts of the prairies in the past few years. Research is currently underway using models to determine if there is a relationship between precipitation or soil moisture and pea leaf weevil population densities.

Insecticides (foliar and systemic) are registered for management of the pea leaf weevil. The efficacy of foliar and systemic insecticides has been investigated in Alberta and Saskatchewan; results indicate that systemic insecticides are more effective than foliar insecticides. If foliar insecticides are used, it should be after the nominal threshold of 30% of plants with damage on the terminal leaves is exceeded. The use of systemic insecticides could be made more efficient with an accurate forecast of pea leaf weevil densities between growing seasons. This is a focus of ongoing research.

The pea leaf weevil survey was conducted by Alberta Agriculture & Forestry, the Saskatchewan Ministry of Agriculture, and Agriculture & Agri-Food Canada (AAFC). The distribution map was prepared by AAFC-Saskatoon.

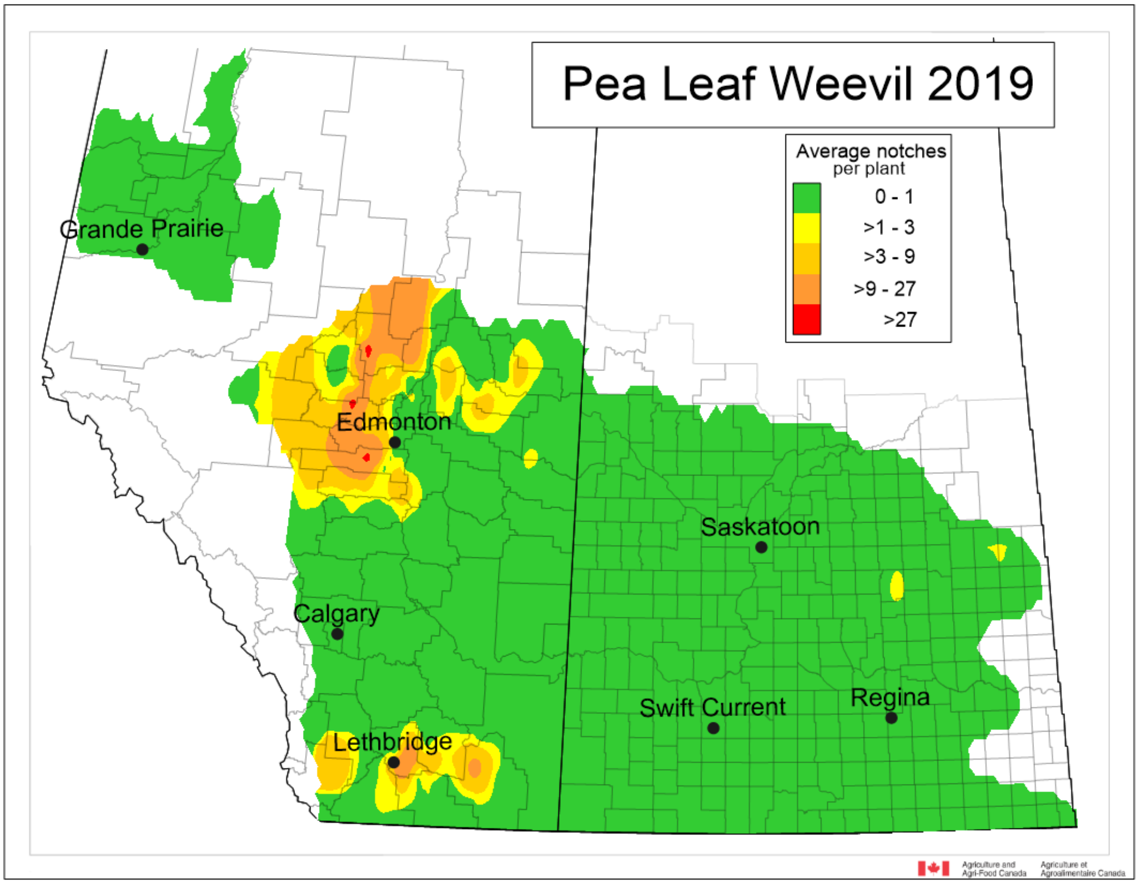

Figure 6. The distribution of pea leaf weevil (*Sitona lineatus*) in Alberta and Saskatchewan in 2019, based on a plant damage survey conducted in the spring in randomly selected field pea crops.