ANNUAL REPORT 2020

WEST-CENTRAL FORAGE ASSOCIATION

West-Central Forage Association

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West-Central Forage Association (WCFA) is a non-profit, producer directed organization providing leading-edge applied, innovative and unbiased research as well as knowledge transfer and learning opportunities to the west-central region. Operating since 1978, we bring together a network of producers, industry and researchers to move the Agricultural industry forward.

We are pleased to make available this edition of our Annual Report.
It contains a description and summary of project results and extension activities carried out by WCFA in 2020.

Table of Contents

President's Message

It's hard to believe that another year has gone by, and here we are once again reflecting on the year gone by.

2020 was quite the year, full of all its own unique challenges. It goes without saying that COVID had a huge impact on everyone, and WCFA was no exception.

With restrictions on in-person events, it was certainly a very different year for WCFA, and our Board. We were unable to get together, and we certainly missed the great networking opportunities, including our AGM. We are certainly hoping that 2021 will look better and that we can get back to some sort of normal.

We had a new staff member join the team in June. Melissa Howard jumped in to take on the responsibility of our plot work, mid-field season, and has done a great job so far. On behalf of the board I would like to thank the staff for their dedication to WCFA. Without our staff, our organization would not be successful, and they certainly faced a unique year.

In closing, I look forward to another year of learning and being part of this great organization, full of innovative like-minded producers. If you have any questions or concerns about what we've been up to this past year, please don't hesitate to reach out.

Grant Chittick

Board President

Manager's Message

To say the year 2020 was a challenge would be putting it mildly. I find myself in an unusual position of reflecting on the past year of an organization without actually being there to experience it. I recently joined the West-Central Forage Association as the General Manager in the Spring of 2021. Much of my attention has been put towards getting the association caught up and back on its feet to move forward.

We had significant changes in the staff at WCFA throughout 2020. Jessica Stambulic, Agronomy Technician, left us in March to join Lac Ste. Anne County and we welcomed Melissa Howard to the team in June as our Forage Research Coordinator.

WCFA also spent much of the year settling into a new location. We were able to partner with Lac St. Anne County to share office as well as shop space. We settled into our new office space at the County Administration building, and set up shop just outside of Sangudo on the north side of Highway 43. The pandemic definitely made settling in to our new spaces a bit of a challenge, but things are going well now.

The pandemic also greatly affected many of our programs as did continuous changes to the provincial funding structure. Many of our upcoming events beginning in early March were cancelled, and we were unable to host any in-person events for the remainder of the year, including the AGM. Border closures due to the pandemic also meant that our Biological Control agent program for Canada thistle was also put on hold, so we were unable to bring in stem-gall flies or stem-mining weevils. Prior to March however, we did hold a few events including our third annual Ladies' Ranching Retreat, which was another great success, as was the one session we were able to host of our Spring Seminar Series.

If funding challenges and a global pandemic were not enough, an incredibly wet spring and summer also provided challenges in regards to our plots. We were able to collect data on our Regional Silage Trial & Hemp Trial, which is an improvement over the 2019 year. Our Perennial Forage Trial went in much later than planned, but we did manage to seed it and we delighted this spring to see that is survived the winter.

I would like to express my gratitude to the staff here at WCFA for all of your hard work and commitment to the organization. As we all know, 2020 was a most unusual year and our staff managed to keep most of our regular operations running as smoothly as could be expected for a pandemic. I would also like to thank our membership base, our producers, as well as our board for being there to support us.

We are looking forward to the coming years.

Becky Doherty

General Manager

2020 Board of Directors

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Grant Chittick	**Brian Dickson**	**Greg Malyk**	**Therese Tompkins**
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Barrhead	Mayerthorpe	Breton	Entwistle
Rod Nikkel	**Brett Byers**	**Shayne Horn**	
Pickardville	Blue Ridge	Thorsby	

2020 Staff

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Forage Research Coordinator
Melissa Howard, BSc., MSc., AIT
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Summer Field Technicians
Jayden Calvert
Alex Hodgson

Acknowledgements

The operation of West-Central Forage Association (WCFA) depends on support and cooperation from many groups and individuals. WCFA would like to extend our sincere appreciation to the many producer cooperators working with us to carry out our projects. You play a very important role in our demonstration and research activities and contribute greatly to the success of these projects. We would also like to thank our members, board of directors, project advisors, cooperators, sponsors, funders and everyone who has supported us throughout the year. Without the support and cooperation of so many, our programming would not be possible.

WCFA would like to acknowledge the following but not limited to, who have contributed to WCFA in a variety of ways by providing funding, donations, inputs, partnered on projects or extension events, lent a helping hand when we needed it or who have provided support. Our sincere apologies for anyone we may have missed.

A&L Canada Laboratories
Agriculture and Agri-Food Canada (AAFC)
Alberta Agriculture and Forestry
Alberta Beef Producers (ABP)
Alberta Environmental Farm Plan (EFP)
Alberta Forage Industry Network (AFIN)
Alberta Lake Management Society (ALMS)
Alex Fedko
ALUS Brazeau
ALUS Canada
ALUS Lac Ste. Anne
ALUS Parkland
Applied Research & Extension Council of Alberta (ARECA)
Bart Guyon
Battle River Research Group (BRRG)
Becky Doherty
Beef Cattle Research Council (BCRC)
BIXs (Business Info Xchange)
Brazeau County
Byers Farms
Canadian Agricultural Partnership (CAP)
Canadian Hemp Trade Alliance (CHTA)
Canadian Round Table for Sustainable Beef (CRSB)
CARA Soil Health Lab
Cherny Fence Supply & Rentals
Chinook Applied Research Association (CARA)
Churchill Land and Cattle
Cows and Fish
Cutting Edge Coaching
Dale Kaliel
Dickson Farms
Farm Firesmart, Lac Ste. Anne County
Farming Smarter (FS)
FarmRite
Fifth Avenue Collection
Foothills Forage and Grazing Association (FFGA)
Gateway Research Organization (GRO)
Grey Wooded Forage Association (GWFA)
Heritage Park, Town of Stony Plain
Jillian Byers
Kelly Sidoryk
Kerri O'Shaughnessy
Kidd Bros.
Lac Ste. Anne County
Lakeland Applied Research Association (LARA)

Lakeland College
Leduc County
Liquor on 16 (Entwistle)
Mackenzie Applied Research Association (MARA)
Manitoba Agriculture
Merck Animal Health
Michelle Cederberg
North Peace Applied Research Association (NPARA)
Northstar Seed Ltd.
Nutrien Ag Solutions
Olds College
Parkland County
Peace Country Beef & Forage Association (PCBFA)
Rianne Bouma
RKR Jewelry
Rylent Farms
Scotiabank
Smoky Applied Research & Demonstration Association (SARDA)
Stonepost Farms Ltd.
Stony Plain Golf Course
Stony Plain Seed Cleaning
Suzanne Rose
University of Alberta, Breton Plots
Woodlands County
Yellowhead County
Yvonne Churchill

TRIALS & DEMONSTRATIONS

2020 Regional Silage Trial

Yield and Quality of Annual Crop Mixtures and Alternative Annual Crops for Forage Production in Alberta

Melissa J Howard, BSc., MSc., AIT

This project is supported by the Canadian Agriculture Partnership (CAP) Adapting Innovative Solutions in Agriculture Program.

Introduction

The Regional Silage Trial (RST) focuses on determining the nutritional qualities and yield of several different silage crops commonly grown in Alberta. WCFA has participated with several other research organizations, to grow, harvest, and report this data to research and industry partners for several years. The data has been used to provide important variety and yield information for the Alberta Seed Guide. More information about the trials and Alberta-wide results can be found on the Alberta seed website at:

https://www.seed.ab.ca/variety-trials/silage/

Participating organizations include:

- Battle River Research Group (BRRG)
- Chinook Applied Research Association (CARA)
- Gateway Research Organization (GRO)
- Lakeland Agricultural Research Association (LARA)
- Mackenzie Applied Research Association (MARA)
- North Peace Applied Research Association (NPARA)
- Peace Country Beef and Forage Association (PCBFA)

Methods

The 2020 trial consisted of six major silage crop types. Unfortunately, we only had the opportunity to seed five of these and only four reached a stage where they could be harvested. The four silage crop types (or trials) included barley, oats, triticale, and Winter/Spring cereal mixes. These were seeded at the Brazeau research plots on June 11th with the cooperation of Bart Guyon. A fifth –the alternatives, was seeded at the Wildwood plots provided by Yellowhead County in late July. The alternatives trial did not grow to a harvestable amount and as such no additional data will be presented regarding it.

In the RST, each crop trial utilizes a check variety for comparison against other varieties. These check varieties are ones that have been grown in Alberta for a significant number of years, and they provide consistent long-term data (sometimes called plot years). Crop data is often presented as percentage of each variety's attributes compared to the check as 100 percent. For example, if the yield of a variety was less than that of the check, it may be presented as 99 or below and if it fared better than the check, it could be 101 and above.

The 2020 barley trial consisted of 14 varieties using CDC Austenson as a check. For the oat trial there were 10 varieties using CDC Baler as a check. The triticale trial also had 10 varieties and used Taza as a check. The Winter/Spring cereal mixes used all three of the previous checks and evaluated nine mixtures at varying combination rates.

Table 1. Agronomic Data for the 2020 Regional Silage Trial in Brazeau County

Treatment	Varieties	Target Plant Density	Seeding Depth (in)	Fertility	Herbicide	Precipitation (in)
Barley	14	122,632	1.5	21-0-0-24	MCPA Amine	12.8
Oats	12	122,632	1.5	21-0-0-24	MCPA Amine	12.8
Triticale	10	151,246	1.5	21-0-0-24	MCPA Amine	12.8
Winter/Spring Cereal Mixes	12	Varied	1.5	21-0-0-24	MCPA Amine	12.8

The silage trials received regular plot maintenance in the form of mowing, hand weeding, weed whipping, and a single early season spraying of MCPA Amine. During the month of September trials were harvested when each crop reached the appropriate stage of maturity, as determined by the trial coordinator. Currently at WCFA trial plots are harvested using a sickle mower, harvested crops are raked into piles to be bucketed and then weighed for wet yield. Subsamples of each variety are taken, dried, used to determine dry yield and sent to A&L Laboratories for feed quality analysis.

Results

Throughout the beginning of the season the trials were subjected to significant rainfall. Total precipitation from seeding on June 11th to harvest of crops in Brazeau on September 25th was 12.8 inches (324.6 mm). Soils were saturated through much of late June into mid-July but fared better through the latter half of the season. A substantial weed problem had already resulted from that early rainfall. This may have resulted in considerable amounts of weeds contributing to yield weights.

In total 3048.96 lbs (1382.75 kg) of dry silage were harvested from the plots at Brazeau. Broken down by silage crop type the yields were 872.4 lbs (395.65 kg) of barley, 580.05 lbs (263.06 kg) of oats, 664.28 lbs (301.26 kg) of the winter/spring cereal mixes, and 932.23 lbs (422.78 kg) of triticale. Crop mass converted to silage at 65% moisture is provided in the tables below. All the silage crops performed at varying yield values both above and below the check varieties that were grown.

Figure 1. Photos of Regional Silage Trails

Barley

Barley was harvested on September 4th and 5th at 84- and 85-days post seeding. Most varieties had reached the dough stage of development, half of the varieties being in soft dough and five varieties being in later stages of dough; one variety was nearly ripe, and a single variety was still in late milk. The variety that reached the greatest height was CDC Cowboy followed very closely by CDC Maverick, despite gaining height neither variety were the top yielding. The variety with the greatest yield, AB Wrangler, had below average height. Lodging was assessed on a 1-5 scale with 1 being entirely erect and 5 laying on the ground; no variety had significant lodging occur.

Table 2. Physical characteristics of 2020 Barley Trial for Regional Silage Trial in Brazeau County

Variety	Lodging	Stage	Days to Stage	Height (in)	Yield 65% (tons/acre)
CDC AUSTENSON	1	Soft Dough	85	34	9.2
AB ADVANTAGE	2	Soft Dough	84	40	9.4
AB CATTLELAC	1	Late Milk	84	37	7.1
AB WRANGLER	1	Dough	85	32	10.9
ALTORADO	1	Soft Dough	84	30	8.7
AMISK	1	Soft Dough	84	31	7.7
CANMORE	1	Dough	85	33	8.7
CDC BOW	1	Hard Dough	85	32	8.8
CDC COWBOY	1	Soft Dough	84	41	8.5
CDC MAVERICK	1	Soft Dough	84	41	7.5
CLAYMORE	1	Dough	85	35	9.2
SR18524	1	Dough	85	30	8.2
SUNDRE	1	Dough	85	36	7.3
TR18647	1	Soft Dough	84	34	8.7

The barley trial showed the check, CDC Austenson, performing slightly better than most of the other varieties at just over 9.2 tons/acre of yield. The greatest yield was achieved by AC Wrangler at almost 10.9 tons/acre, more than 1.7 tons/acre greater than CDC Austenson. The variety with the lowest yield was AB Cattllelac with just over 7.1 tons/acre, less than the check by roughly 2 tons/acre.

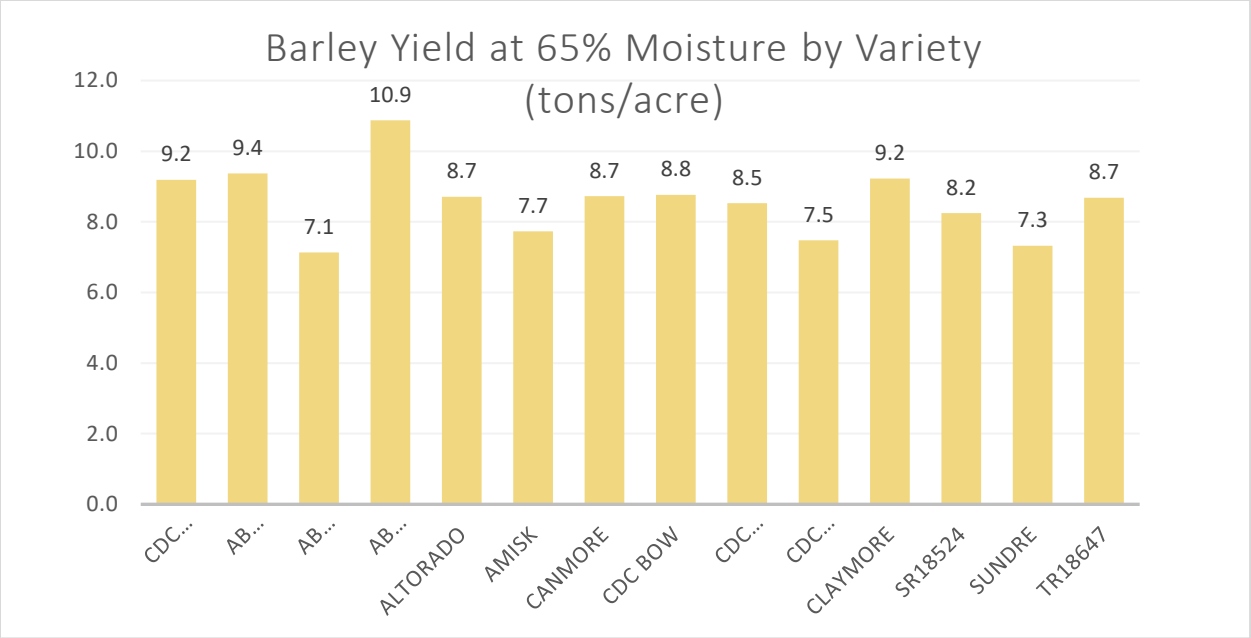

Figure 2. Barley Yield by Variety for 2020 Regional Silage Trial in Brazeau County

The feed quality analysis is presented as a percentage of the check variety CDC Austenson (raw data can be provided upon request). A few varieties performed better than the check with regard to feed quality analysis, but underperformed in the yield category. AB Advantage showed some of the highest increases in crude protein, calcium and phosphorus while having lower percentages of acid and neutral detergent fiber and only a slightly lower yield than CDC Austenson.

Table 3. feed quality analysis nutrient categories of 2020 Barley Trial for Regional Silage Trial in Brazeau County

Variety	CP	TDN	CA	P	K	MG	ADF	NDF	Yield
CDC AUSTENSON*CHECK	8.0	68.9	0.30	0.17	1.38	0.09	36.5	54.6	9.2
CDC AUSTENSON*CHECK	100	100	100	100	100	100	100	100	100
AB ADVANTAGE	134	102	134	150	102	122	95	88	102
AB CATTLELAC	123	101	134	138	113	133	98	90	78
AB WRANGLER	104	99	117	121	103	89	105	97	118
ALTORADO	119	103	125	118	101	106	99	93	95
AMISK	122	106	107	124	107	111	94	83	84
CANMORE	106	103	122	109	105	89	97	94	95
CDC BOW	112	100	120	106	77	106	102	98	95
CDC COWBOY	112	102	98	132	105	128	97	92	93
CDC MAVERICK	115	103	98	135	93	122	93	92	81
CLAYMORE	103	100	139	94	95	100	103	101	100

Variety	CP	TDN	CA	P	K	MG	ADF	NDF	Yield
SR18524	106	102	103	121	104	117	99	89	90
SUNDRE	114	100	120	168	111	144	101	91	80
TR18647	113	101	90	126	113	100	101	96	94

Note: all numbers are presented as a percentage of the check, CDC Austenson. CDC Austenson's performance is shown in the top two rows of the table.

Figure 3. Barley plots in August 2020

Figure 4. Height reference for Barley in August 2020

Oats

Oats were harvested on September 9th and 10th at 90 and 91 days from seeding. All varieties had reached the milk stage of development, half of the varieties being in late milk and 5 varieties being at a stage just a bit earlier. The variety that reached the greatest height was CDC Nasser at 46 inches (116 cm). The variety with the greatest yield was the check CDC Baler. Lodging was assessed on a 1-5 scale with 1 being entirely erect and 5 laying on the ground, all varieties had a little bit of lodging depending upon field placement. The worst lodging was experienced by the check CDC Baler, followed by CDC Haymaker.

Table 4. physical characteristics of 2020 Oat Trial for Regional Silage Trial in Brazeau County

Variety	Lodging	Stage	Days to Stage	Height (in)	Yield 65% Moisture (tons/acre)
CDC BALER	3	Early Milk	91	43	6.8
AC JUNIPER	1	Late Milk	91	37	7.1
AC MORGAN	1	Milk	90	37	7.0
CDC ARBORG	1	Late Milk	91	42	6.5
CDC HAYMAKER	2	Milk	90	42	5.6

Variety	Lodging	Stage	Days to Stage	Height (in)	Yield 65% Moisture (tons/acre)
CDC NASSER	2	Milk	90	46	5.1
CDC SEABISCUIT	1	Milk	90	39	6.3
CS CAMDEN	1	Late Milk	91	36	7.0
MURPHY	1	Late Milk	91	37	7.2
ORE 3542 M	1	Late Milk	90	37	5.3

The oat trial showed the check, CDC Baler, performing worse than 4 other varieties at just over 6.8 tons/acre. The greatest yield was achieved by Murphy at more than 7.2 tons/acre, about 0.4 tons/acre greater than CDC Baler. The variety with the lowest yield was CDC Nasser with just over 5.1 tons/acre, less than the check by roughly 1.7 tons/acre and less than the best performer by more than 2 tons/acre.

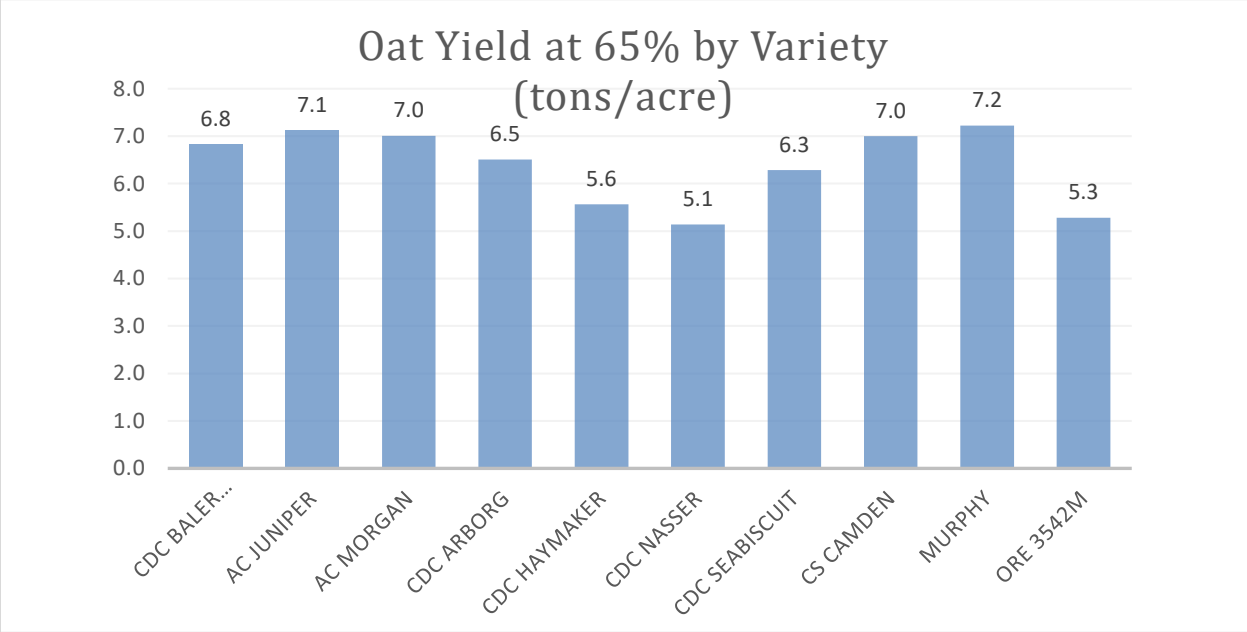

Figure 5. Oat Yield by Variety for 2020 Regional Silage Trial in Brazeau County

The feed quality analysis is presented as a percentage of the check variety CDC Baler (raw data can be provided upon request). There was no variety that consistently performed better than CDC Baler in every category.

Table 5. Feed quality analysis nutrient categories of 2020 Oat Trial for Regional Silage Trial in Brazeau County

Variety	CP	TDN	CA	P	K	Mg	ADF	NDF	Yield
CDC BALER*CHECK	10.7	63.4	0.35	0.24	1.98	0.12	39.0	57.6	6.8
CDC BALER *CHECK	100	100	100	100	100	100	100	100	100

Variety	CP	TDN	CA	P	K	Mg	ADF	NDF	Yield
AC JUNIPER	87	110	77	108	87	88	91	80	103
AC MORGAN	88	106	87	113	101	88	96	90	103
CDC ARBORG	90	107	71	113	100	88	94	85	98
CDC HAYMAKER	93	106	91	113	103	83	93	92	88
CDC NASSER	90	106	89	108	88	100	95	90	80
CDC SEABISCUIT	91	111	87	108	81	83	87	78	97
CS CAMDEN	92	111	84	115	84	96	93	86	103
MURPHY	92	110	87	102	75	83	88	80	104
ORE 3542M	87	110	84	135	107	88	91	86	80

Note: All numbers are presented as a percentage of the check, CDC Baler. CDC Baler's performance is shown in the top two rows of the table.

Figure 6. Oat plots in August 2020

Figure 7. AC Morgan Oats in August 2020

Triticale

Triticale was harvested on September 23rd and 24th at 104 and 105 days from seeding. All varieties had reached the milk stage of development, five of the varieties being in early milk and five varieties being in a later stage of milk. The variety that reached the greatest height was Bunker at 46 inches (116.5 cm). The variety with the greatest yield, Sunray, had the next greatest height. Lodging was assessed on a 1-5 scale with 1 being entirely erect and 5 laying on the ground, no variety had significant lodging occur.

Table 6. physical characteristics of varieties in the 2020 Triticale Trial for Regional Silage Trial in Brazeau County

Variety	Lodging	Stage	Days to Stage	Height (in)	Yield 65% Moisture (tons/acre)
TAZA	1	Early Milk	105	44	9.8
AAC AWESOME	1	Late Milk	105	37	11.8
AAC DELIGHT	1	Early Milk	105	40	9.5
AAC PARAMOUNT	1	Milk	105	35	13.9
AC ANDREW	1	Late Milk	105	37	14.4

Variety	Lodging	Stage	Days to Stage	Height (in)	Yield 65% Moisture (tons/acre)
AC SADASH	1	Late Milk	104	34	9.8
BUNKER	1	Early Milk	105	46	11.8
KWS ALDERON	1	Late Milk	104	32	10.3
SUNRAY	1	Early Milk	105	44	15.0
T256	1	Early Milk	105	40	13.8

In the triticale trial the average yield was slightly above the check yield, indicating that many varieties outgrew Taza at just over 9.8 tons/acre. Half of the varieties grown had yields at least 2 tons/acre greater than Taza. Two varieties performed similar to Taza in yield, the lowest yielding variety being AAC Delight with roughly 9.3 tons/acre.

The feed quality analysis is presented as a percentage of the check variety, Taza (raw data can be provided if requested). There was no variety that consistently performed better or worse than Taza in every category.

Figure 8. Triticale Plots in August 2020

Figure 9. Height reference photo in August 2020

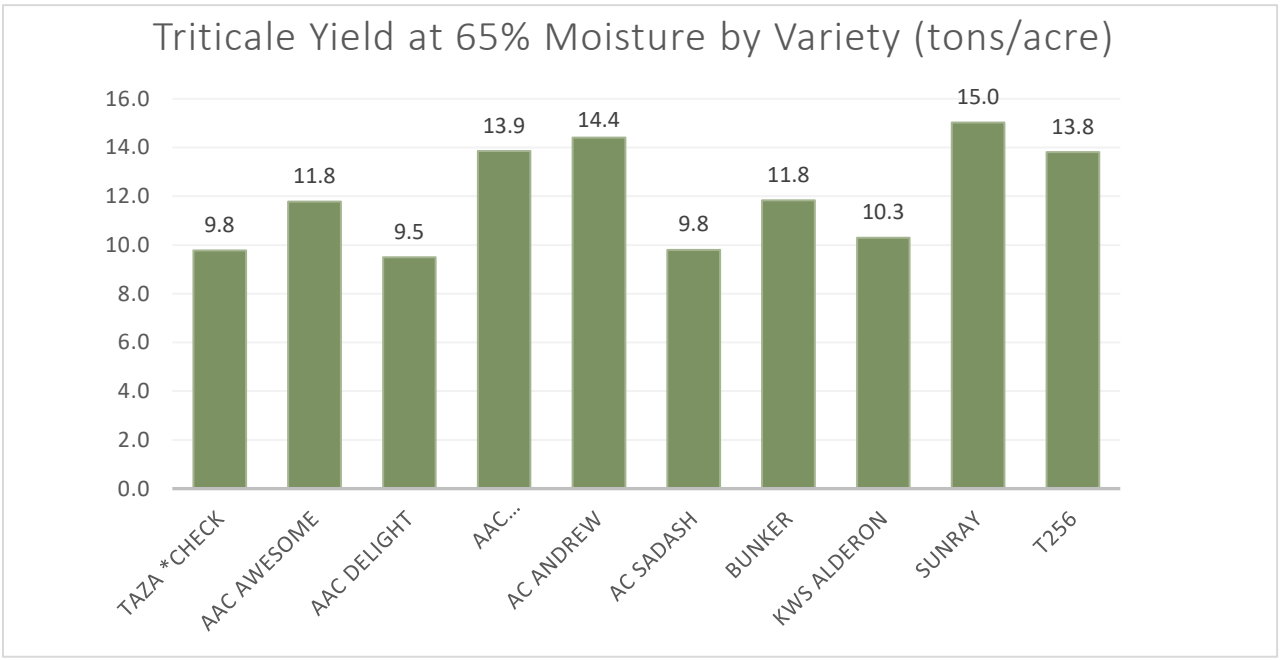

Figure 10. Triticale Yield by Variety for 2020 Regional Silage Trial in Brazeau County

Table 7. Feed quality analysis nutrient categories of 2020 Triticale Trial for Regional Silage Trial in Brazeau County

Variety	CP	TDN	Ca	P	K	Mg	ADF	NDF	Yield (tons/ac)
TAZA*CHECK	9.4	67.8	0.18	0.19	1.09	0.07	36.0	56.7	9.8
TAZA*CHECK	100	100	100	100	100	100	100	100	100
AAC AWESOME	100	103	83	76	100	107	95	93	120
AAC DELIGHT	98	106	78	95	80	86	92	85	97
AAC PARAMOUNT	98	104	97	95	113	107	95	92	142
AC ANDREW	100	107	72	121	95	121	92	83	147
AC SADASH	92	105	75	95	91	114	93	88	100
BUNKER	97	102	86	100	80	107	99	96	121
KWS ALDERON	108	104	75	103	91	143	94	93	105
SUNRAY	99	106	92	92	96	93	91	91	154
T256	101	104	86	100	85	143	97	90	141

Note: All numbers are presented as a percentage of the check, Taza. Taza's performance is shown in the top two rows of the table.

Winter and Spring Cereal Mixes

The Winter Spring Cereal mixes were harvested on September 11th, 14th, and 15th at 92-, 95-, and 96-days post seeding. Most mixes had reached at least the milk stage of development. The mix that reached the greatest height was Prima/Baler B at just over 116 cm. The variety with the greatest yield was the check for the oat mixes, CDC Baler. Lodging was assessed on a 1-5 scale with 1 being entirely erect and 5 laying on the ground, no mixes experienced significant lodging.

Table 8. physical characteristics of varieties in the 2020 Winter and Spring Cereal Mixes Trial for Regional Silage Trial in Brazeau County

Variety	Variety 1 (%)	Variety 2 (%)	Lodging	Stage	Days to Stage	Height (in)	Yield 65% Moisture (tons/ac)
TAZA	100	0	1	Milk	95	44	12.5
AAC WILDFIRE/TAZA	0	100	1	Milk	92	42	12.7
BOBCAT/TAZA	0	100	1	Dough	92	45	12.4
PRIMA/TAZA	10	90	1	Early Milk	92	42	12.3
CDC BALER	100	0	1	Dough	95	48	18.4

Variety	Variety 1 (%)	Variety 2 (%)	Lodging	Stage	Days to Stage	Height (in)	Yield 65% Moisture (tons/ac)
AAC WILDFIRE/CDC BALER	2	98	1	Milk	95	39	16.2
PRIMA/CDC BALER A	0	100	1	Early Milk	92	40	18.4
PRIMA/CDC BALER B	4	96	1	Milk	96	46	17.4
CDC AUSTENSON	100	0	1	Milk	95	29	11.7
AAC WILDFIRE/CDC AUSTENSON	10	90	1	Soft Dough	92	30	11.8
BOBCAT/CDC AUSTENSON	3.5	96.5	1	Heading	96	31	10.3
PRIMA/CDC AUSTENSON	2	98	1	Milk	95	34	10.2

The highest yields in the mixes trial were achieved by those having CDC Baler. Most mixes had on average 10 or less percent establishment of the non-check cereal variety, lack of significant variability in the yields is most likely a result of this.

The feed quality analysis is presented as a percentage of the check varieties Taza, CDC Baler, and CDC Austenson (raw data can be provided upon request). No mixes consistently performed better than the check varieties in all categories. All mixes reduced the crude protein and calcium available in the feed and increased the phosphorus as compared to the check varieties. There were no other trends observed.

Table 9. feed quality analysis nutrient categories of 2020 Winter and Spring Cereal Mixes Trial for Regional Silage Trial in Brazeau County

Variety	CP	TDN	Ca	P	K	Mg	ADF	NDF	Yield (tons/ac)
TAZA*CHECK	9.7	68.6	0.2	0.2	1.3	0.1	34.8	55.2	12.5
TAZA*CHECK	100	100	100	100	100	100	100	100	100
AAC WILDFIRE/TAZA	98	100	75	117	84	75	103	105	104
BOBCAT/TAZA	96	99	75	102	76	75	104	105	99
PRIMA/TAZA	95	99	75	107	81	75	104	104	98
CDC BALER*CHECK	9.3	65.5	0.3	0.2	1.8	0.1	38.4	55.9	18.4
CDC BALER*CHECK	100	100	100	100	100	100	100	100	100
AAC WILDFIRE/CDC BALER	95	101	87	115	89	100	98	97	88

Variety	CP	TDN	Ca	P	K	Mg	ADF	NDF	Yield (tons/ac)
PRIMA/CDC BALER A	97	102	84	100	86	91	97	98	100
PRIMA/CDC BALER B	97	102	109	107	108	95	97	98	94
CDC AUSTENSON*CHECK	9.1	72.0	0.3	0.2	1.3	0.1	33.5	48.0	11.7
CDC AUSTENSON*CHECK	100	100	100	100	100	100	100	100	100
AAC WILDFIRE/CDC AUSTENSON	92	96	86	112	115	95	109	112	101
BOBCAT/CDC AUSTENSO	95	97	84	100	90	90	105	109	88
PRIMA/CDC AUSTENSON	99	99	73	112	78	80	102	102	88

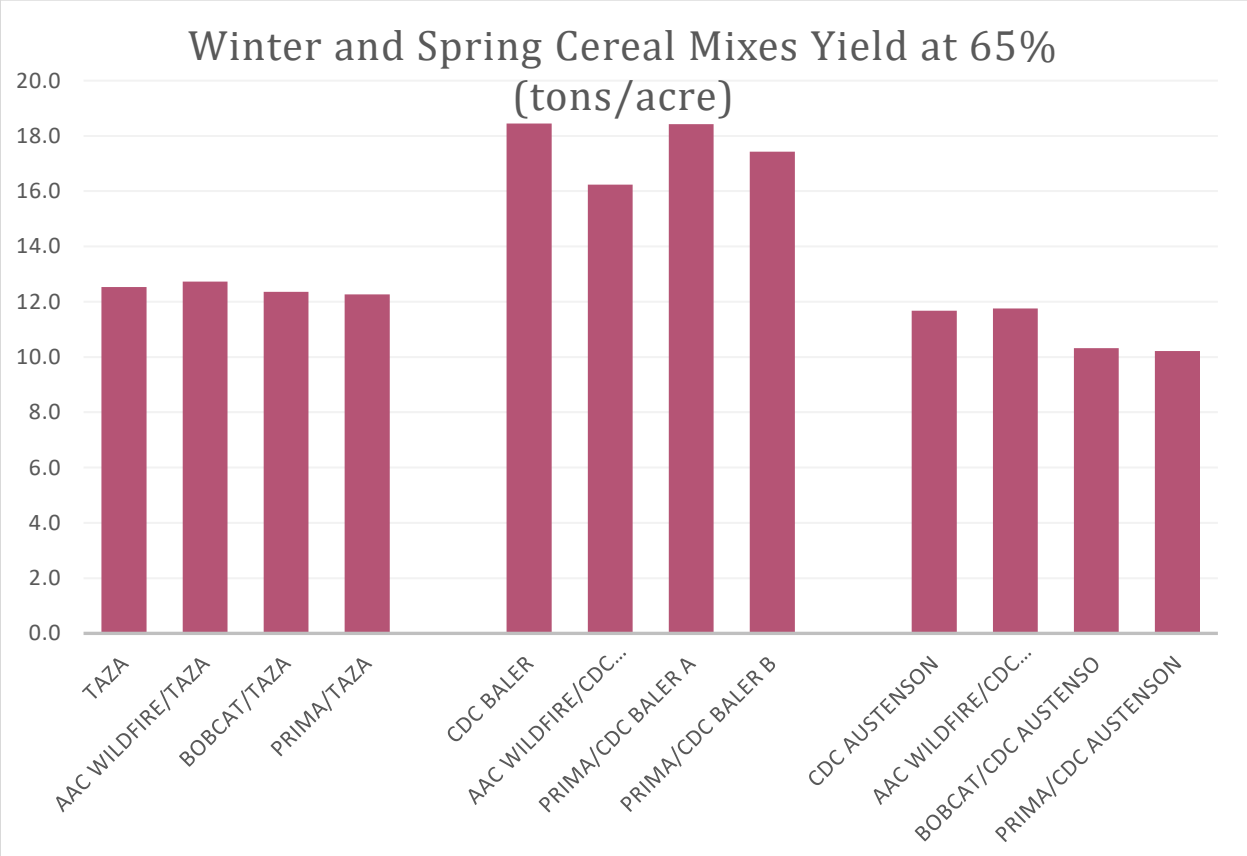

Figure 11. Winter and Spring Cereal Mixes Yield by Variety for 2020 Regional Silage Trial in Brazeau County

Conclusion and Future Work

Overall, the 2020 research year proved to be a difficult one with regard to balancing timing, environmental factors, and an access to resources, including human ones. Our crops were slow to start, at times drowning in water, overrun with weeds, and took some logistical juggling to get off the field. Despite all this, the 2020 Regional Silage Trial gave us an abundance of information to send off to our project coordinator. The trials showed many of the checks still performing at relatively decent levels with a few strong competitors at times providing great results.

The Regional Silage Trials will be seeded again in the spring of 2021. The RST will be the first project installed at the new research site provided by Lac Ste. Anne County in Sangudo. These trials will once again be accessible to the public and WCFA will continue to provide updates on their progress to the public and association members.

This trial was made possible by our many contributors, cooperators and staff, without whom the work would never have come together. The 2021 trials may prove to be just as challenging in many regards. Yet even with the many uncertainties ahead we look forward to bringing you, our association members, as much valuable research as we can.

2020 CHTA National Industrial Hemp Variety Evaluation Trial

Melissa J Howard BSc., MSc., AIT

This project is supported by the Canadian Agriculture Partnership (CAP) Adapting Innovative Solutions in Agriculture Program.

Introduction

In order for industrial hemp to be a profitable crop for Canadian farmers it is important to understand which cultivars grow best in particular regions of Canada. Industrial hemp is highly regulated around the world. Limits on the amount of both THC and nonnarcotic cannabinoids in hemp products requires a constant understanding of the evolution of hemp cultivars being used by the hemp industry. To balance the regulations and the difficult task of growing industrial hemp for profitable commercial purposes monitoring through scientific study and laboratory analysis is required. The Canadian Hemp Trade Alliance (CHTA) National Industrial Hemp Variety Evaluation Trials were designed to do exactly this. WCFA has participated in the CHTA National Industrial Hemp Variety Evaluation Trial since 2018. By understanding which varieties have been cultivated to withstand growth conditions that are seen in our area we can help producers choose the best varieties for their fields. The CHTA National Industrial Hemp Variety Evaluation Trial is organized by James Frey of Manitoba Agriculture and Resource Development.

Methods

Cultivars of industrial hemp in this study are separated into two types dependent upon their purposes. Grain varieties have been cultivated to provide a source of seed for use in the food industry and have the potential to be used in the forage industry; though this has yet to be permitted by the federal government. Dual purpose varieties have been cultivated to provide both grain for the previously mentioned purposes as well as to provide fiber for inclusion in products like pulp and textiles.

Table 10. Agronomic Data for 2020 CHTA National Industrial Hemp Variety Evaluation Trial conducted in Brazeau County

Cultivar Type	Varie-ties	Seeding					Harvest Date		
		Date	Depth (in)	Soil Temp (˚C)	Rate (lbs/ac)	Fertility	Grain	Fibre	NNC
Dual-Purpose	6	05-Jun	1.5	11	150 lbs	21-0-0-24	28-Sept	18-Sept	N/A
Grain	7	05-Jun	1.5	11	150 lbs	21-0-0-24	30-Sept	N/A	17-Sept

For the 2020 research season six varieties of dual-purpose hemp and seven varieties of grain hemp were grown with the cooperation of Bart Guyon and Brazeau County. Plots were seeded on June 5th and monitored for disease and weeds throughout the summer months. One week prior to harvest plants were measured for height and lodging. Lodging was assessed on a 1-5 scale with 1 being entirely erect and 5 laying on the ground. Fiber quality samples were harvested from the dual-purpose varieties on September 18th, 2020, while yield samples were harvested on September 30th. Nonnarcotic cannabinoids samples were harvested from the grain hemp on September 17th and yield samples were harvested on September 28th. It is common to wait until seeds have reached a moisture content of 10% before harvesting crops, however the trial had been seeded later than expected. The danger of crop loss occurring was considered high and as such harvesting occurred before the dual-purpose hemp could reach the appropriate maturity.

Results

Dual-Purpose

The dual-purpose varieties are on average much larger than the grain hemp varieties with minimum average heights of the 2020 crop nearing four feet and maximum average height nearing five. These heights are, however, much shorter than have been noted in previous years. Lodging occurred to some degree on most dual-purpose varieties, most likely on account of their height. The range of establishment rates for the dual-purpose varieties is also larger than that of the grain varieties with there being as few as 151, 757 plants per acre in CRS-1, the check variety plots, and a maximum rate of 467, 637 plants per acre for the Vega plots. Some varieties favoured growth of either grain or fiber. NWG 2730 produced the lowest mass of grain but the second highest fiber yield. Rigel produced the highest fiber yield but a mid range grain yield, though only 250lbs per acre less than the highest yield. The grain and fiber yield was consistently high in the Altair variety as well, which had the highest grain yield and produced only 400 lbs/acre less fiber than Rigel. Both these varieties tied for estimated grain yield per plant.

Table 11. Results for Dual-purpose varieties in the CHTA National Industrial Hemp Variety Evaluation Trial conducted in Brazeau County

Variety	Lodging	Height (in)	Plants/acre	Grain Mass (lbs/acre)	Fiber (lbs/acre)	Est Grain (lbs/plant)
CRS-1*Check	1.00	43.30	151,757	1219	1160	0.008
Altair	1.50	56.80	336,114	1927	1963	0.006
Anka	1.38	53.60	341,735	1807	1562	0.005
NWG 2730	1.88	52.60	191,102	318	2052	0.002
Rigel	1.13	49.50	261,922	1677	2365	0.006
Vega	1.13	48.15	467,637	1772	1919	0.004

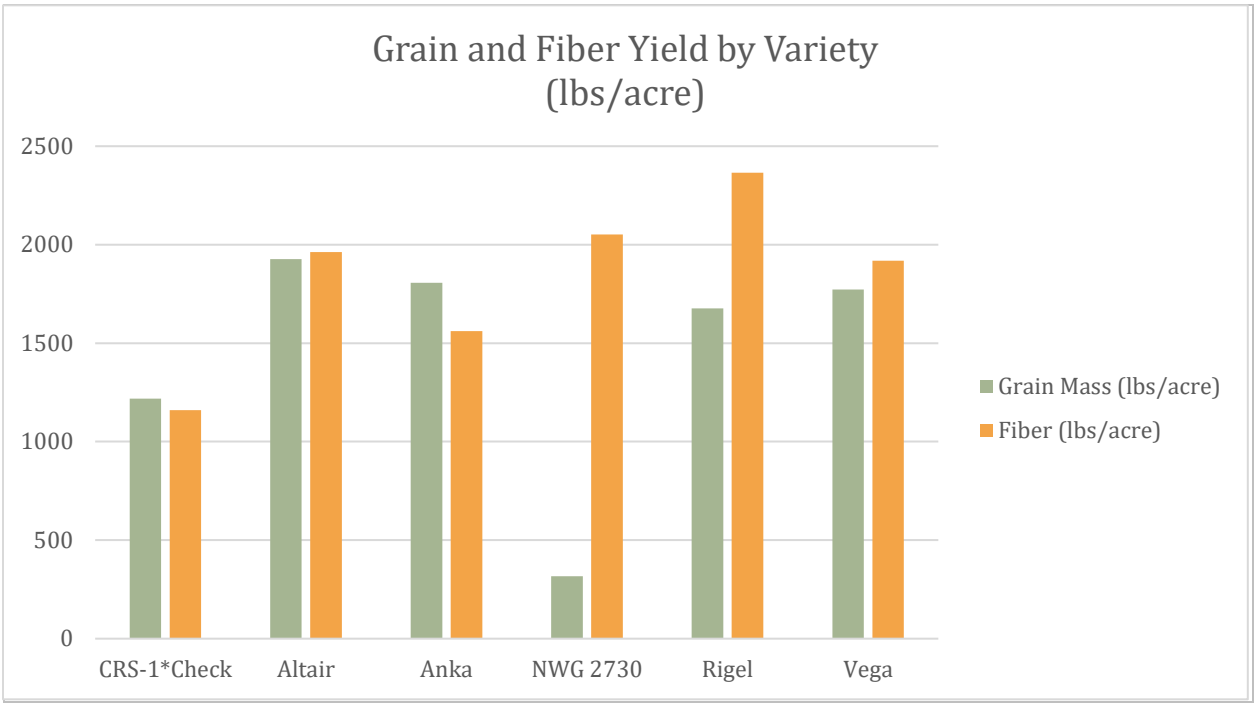

Figure 12. Comparison of grain and fiber yield for dual-purpose varieties in the CHTA National Industrial Hemp Variety Evaluation Trial conducted in Brazeau County

Grain

The 2020 crop of grain varieties were on average half the size of the dual-purpose varieties. The exception to this was Petera which reached over 41 inches in height. Lodging was minimal on most varieties of grain hemp. Establishment of the grain hemp was relatively similar among many varieties, with the exception of the X59 plots that had establishment numbers more than two times higher than most other varieties. X59 also had the highest grain yield (graph 2.3.4) but one of the lowest estimated grain yields per plant (table 2.3.3). CFX-2 had the second highest grain

yield (graph 2.3.4). Both CFX-2 and Picolo have an estimated 0.003 lbs of grain per plant, though the former had a better establishment rate.

Table 12. Results for grain varieties in the CHTA National Industrial Hemp Variety Evaluation Trial conducted in Brazeau County

Variety	Lodging	Height (in)	Plants/acre	Grain Mass (lbs/acre)	Est Grain (lbs/plant)
CRS-1*Check	1.25	24.13	221,453	438	0.002
CFX-2	1.00	24.79	200,095	556	0.003
Grandi	1.00	19.71	223,701	332	0.001
Katani	1.00	20.32	188,853	302	0.002
Petera	1.63	41.25	245,060	196	0.001
Picolo	1.00	23.37	176,488	472	0.003
X59	1.00	25.04	473,258	578	0.001

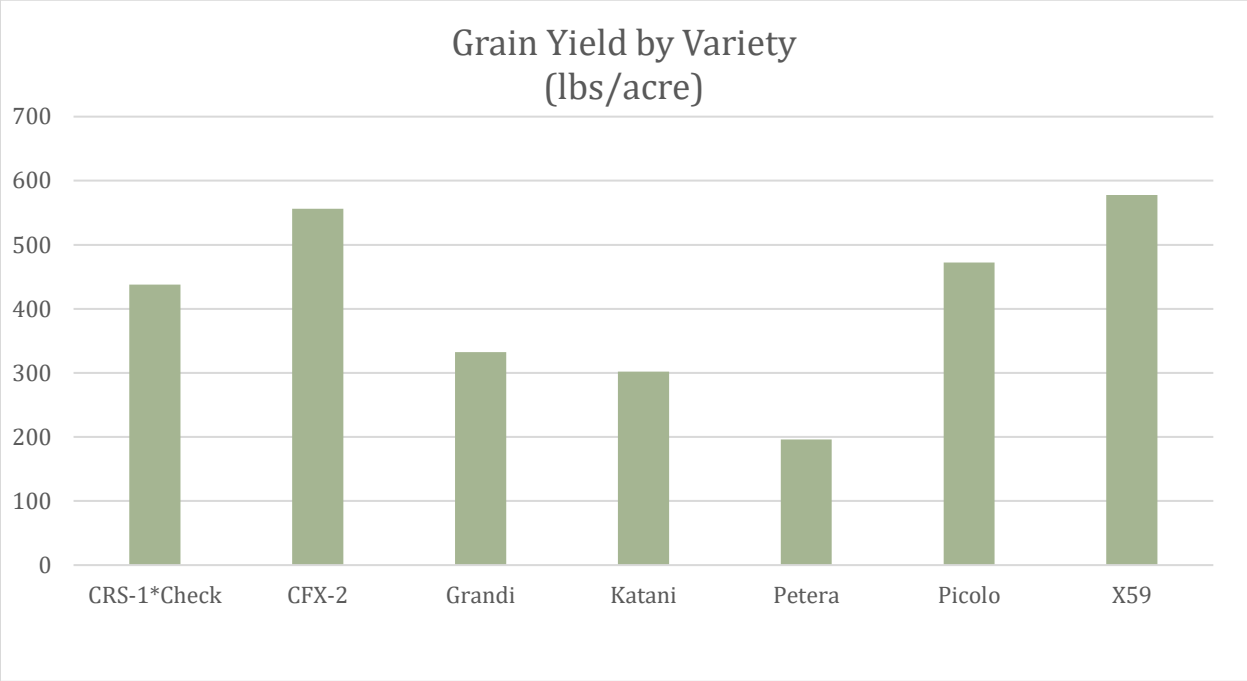

Figure 13. comparison of yield for grain varieties in the CHTA National Industrial Hemp Variety Evaluation Trial conducted in Brazeau County

Figure 14. Photos Hemp Trails

Conclusion and Future Work

Though the purpose of each type of cultivar is different, the dual-purpose varieties outperformed the grain hemp varieties in the production of grain. The grain hemp varieties that produced the most amount of grain per plant still only produced half as much as the dual-purpose varieties. Grain hemp did however, have much more reliable establishment numbers. The grain hemp varieties also produced thinner smaller stalks making it a more suitable crop for forage. When its use as a forage crop is permitted it may be a decent addition to forage mixes. The dual-purpose varieties of the WCFA 2020 plots were smaller than noted in previous years. Establishment numbers were better for some varieties of the dual purpose than for others, but all varieties did well, considering the amounts of precipitation that occurred early in the season.

The Canadian Hemp Trade Alliance National Industrial Hemp Variety Evaluation Trials will once again be seeded at the Brazeau research plots in the spring of 2021. While there was limited ability to hold extension events in 2020 due to Covid-19 restrictions WCFA is hoping these events will move forward in 2021. The research plots are open to the public for viewing regardless of planned events. Additional information on the CHTA Industrial Hemp Variety Trials can be made available upon request.

2020 Evaluation of Perennial Forage Mixes for Hay or Pasture

Melissa J. Howard BSc., MSc., AIT

This project is supported by the Canadian Agriculture Partnership (CAP) Adapting Innovative Solutions in Agriculture Program.

Introduction

The Evaluation of Perennial Forage Mixes for Hay or Pasture or Perennial Forage Trial (PFT) is a joint trial designed by the Chinook Applied Research Association (CARA) and contributed to by nine research organizations, including WCFA. The PFT is a continuation of the perennial evaluation trials of previous years. The goal of this research is to understand the seedling mortality, perennial survivability, yield and nutritional quality of several perennial forages.

Participating organizations include:

- Battle River Research Group (BRRG)
- Chinook Applied Research Association (CARA)
- Farming Smarter (FS)
- Gateway Research Organization (GRO)
- Lakeland Agricultural Research Association (LARA)
- MacKenzie Applied Research Association (MARA)
- North Peace Applied Research Association (NPARA)
- Peace Country Beef and Forage Association (PCBFA)
- SARDA Ag Research

Methods

For 2020, deliverables included the sowing of 4 blocks of legumes (Alfalfa, Sainfoin, and Cicer milkvetch), grasses, and mixtures (legumes and grasses) at the Wildwood Plots donated by Yellowhead County in late July. Emergence counts were done at 7-, 14-, and 21-days post seeding and 1st season mortality at 70 days. Counts are done by placing a 0.25m^2 frame at 3 spots on the plot and each plant or grass blade inside the square is counted. Technicians used flags to mark out the corners of each square so that the same sample area was counted throughout the growing season. The plant count for each in the report is an average of all 12 sample plots for each variety. For grasses blades were counted rather than plants. Since several varieties of grass were used it is helpful to use density as a visualization tool. According to the museum of natural history in the United States of America the average number of blades per meter squared of turf is almost 32,280. Sample plots were ¼ of a square meter. The number of blades for a turf like density should be around 8,070 per plot.

Results

Overall there is very little to report for results on the PFT with the exception of count data. The comparison of count data from days 14 and 70 shows establishment success and mortality during the early fall. Results are shown as average number of plants and/or grass blades per sample plot.

Alfalfa

The average establishment of alfalfa across varieties was 43 plants per sample plot. AC Grazeland established the best by 14 days with an average of 63.4 plants, while Halo 2 had an average establishment of 26.9 plants (see graph 3.3.1, dark green bars).

All alfalfa saw slight mortality over the fall season with an average loss of around 7.5 plants per sample plot. The average number of live plants for all varieties at 70 days was 35.4 plants per plot. Grazeland, which had higher establishment numbers, saw the largest decrease by day 70 from 63.4 to 46.6. Having the most amount of live plants at 70 days was Rangelander with 53 plants per sample plot. While Halo 2 once again had the fewest plants per plot it actually increased its average plant count from 26.9 plants to 27.4 (see graph 3.3.1, light green bars).

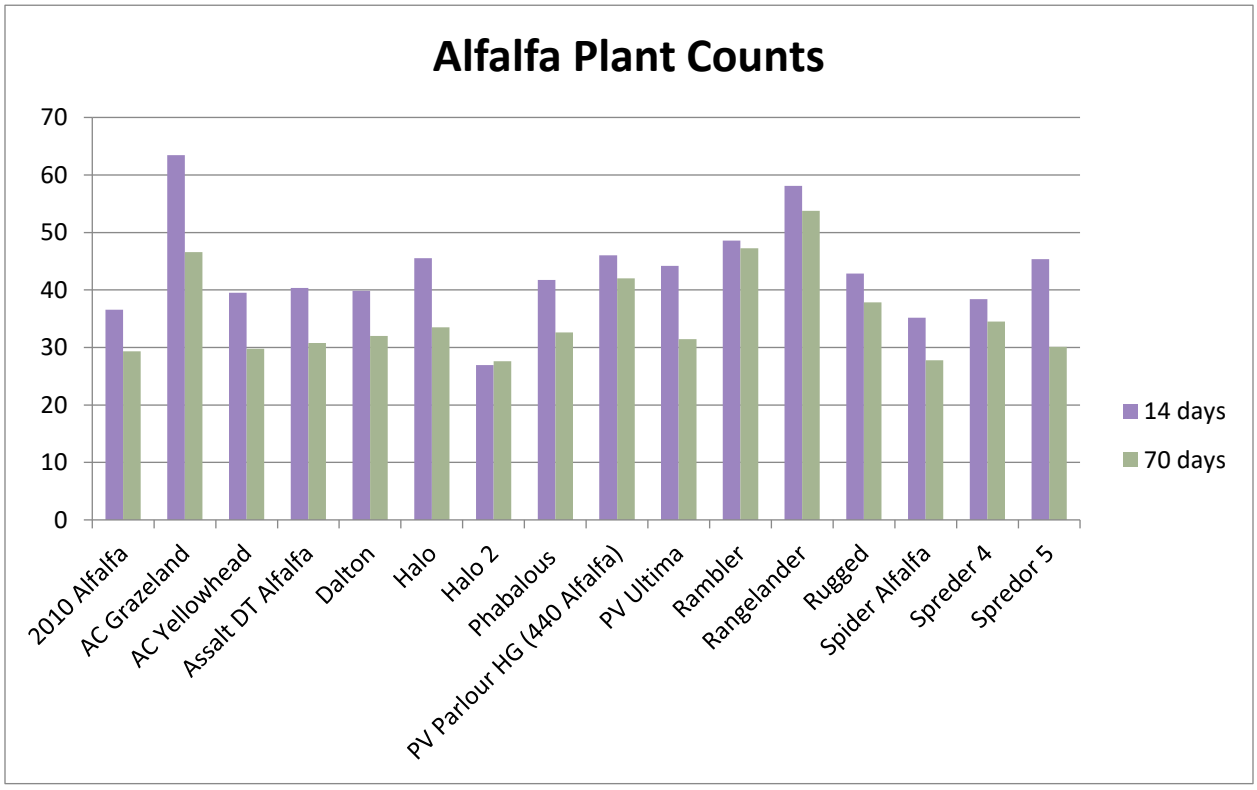

Figure 15. Average number of established alfalfa plants per 0.25m2 plot at 14- and 70-days post seeding for the Evaluation of Perennial Forage Mixes for Hay or Pasture Trial 2020

Sainfoin and Cicer Milkvetch

Sainfoin and Cicer Milkvetch establishment occurred but was sparse overall. The average establishment over all four seeded varieties was 4 plants per sample plot at 14 days. The majority of this was accounted for by the two Sainfoin varieties AAC Glenview and AC Mountainview. AAC Mountainview had the highest sample plot average with 7.3 plants. The Cicer milk vetch had much lower establishment numbers, both Oxley 2 and Veldt were deadlocked at just 1.75 plants per plot.

By 70 days some mortality was observed and the average for all varieties dropped to 2.13 plants per sample plot. The plot average trend remained consistent with the 14-day count, AAC Glenview having the highest at 3.8 and Oxley 2 having the lowest at 0.67 plants per sample plot.

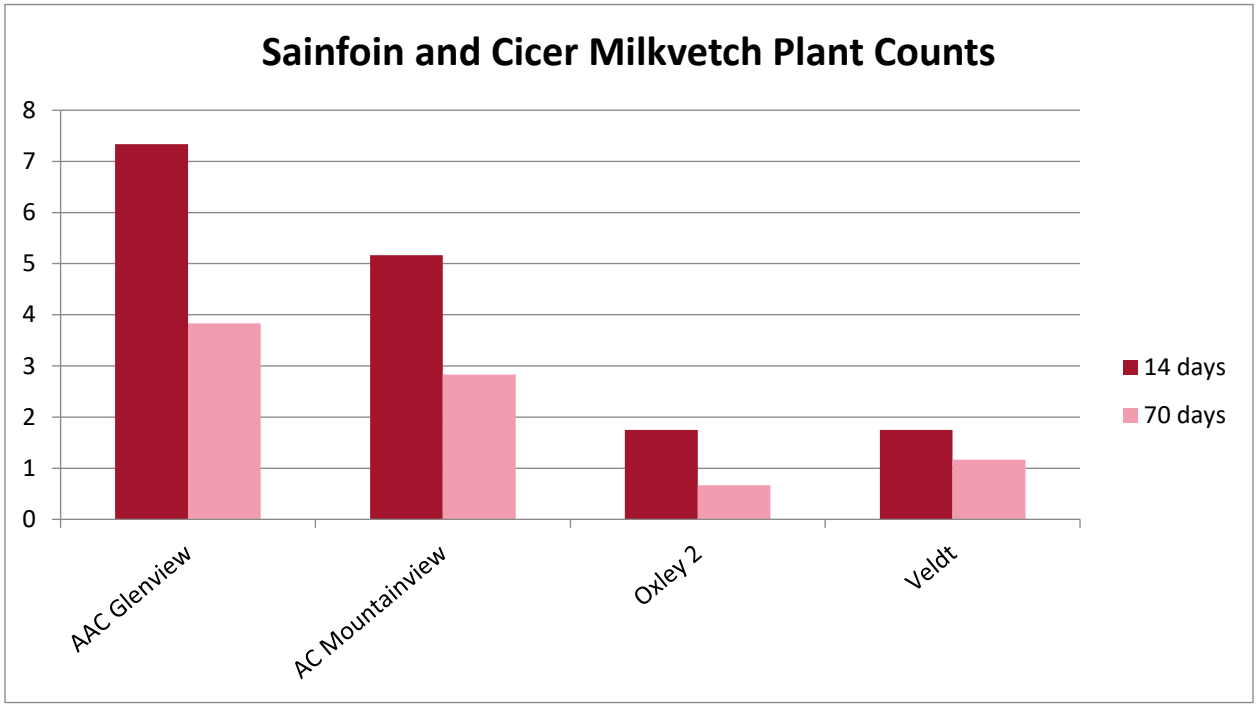

Figure 16. Average number of established Sainfoin and Cicer milkvetch plants per 0.25m2 plot at 14- and 70-days post seeding for the Evaluation of Perennial Forage Mixes for Hay or Pasture Trial 2020

Mixes

Like the alfalfa and sainfoin varieties the mixes saw an average decrease in the amount of plants surviving throughout the early fall season. At day 14 the average establishment across all mixed varieties was 21.15 per plot. The mix that had the best establishment at 14 days was Legumeaster with 46.16 plants per sample plot. The mix that established the least was a Success/Yellowhead/Mountainview/Veldt with 7.33 per sample plot.

By 70 days the average count for all varieties was 14.79 per sample plot. Of these mixes only one saw increased numbers over the season and that was the AC Knowles/Yellowhead mix, the AC Knowles was also included in the grass varieties and saw an increase over the season so it should be assumed this increase is on account of the continued grass establishment. The mix with the highest average sample plot count at 70 days was the AC Knowles/Spredor 5 mix with 29 per sample plot. The mix with the lowest average was the Fleet/Yellowhead mix with 4.08 per sample plot.

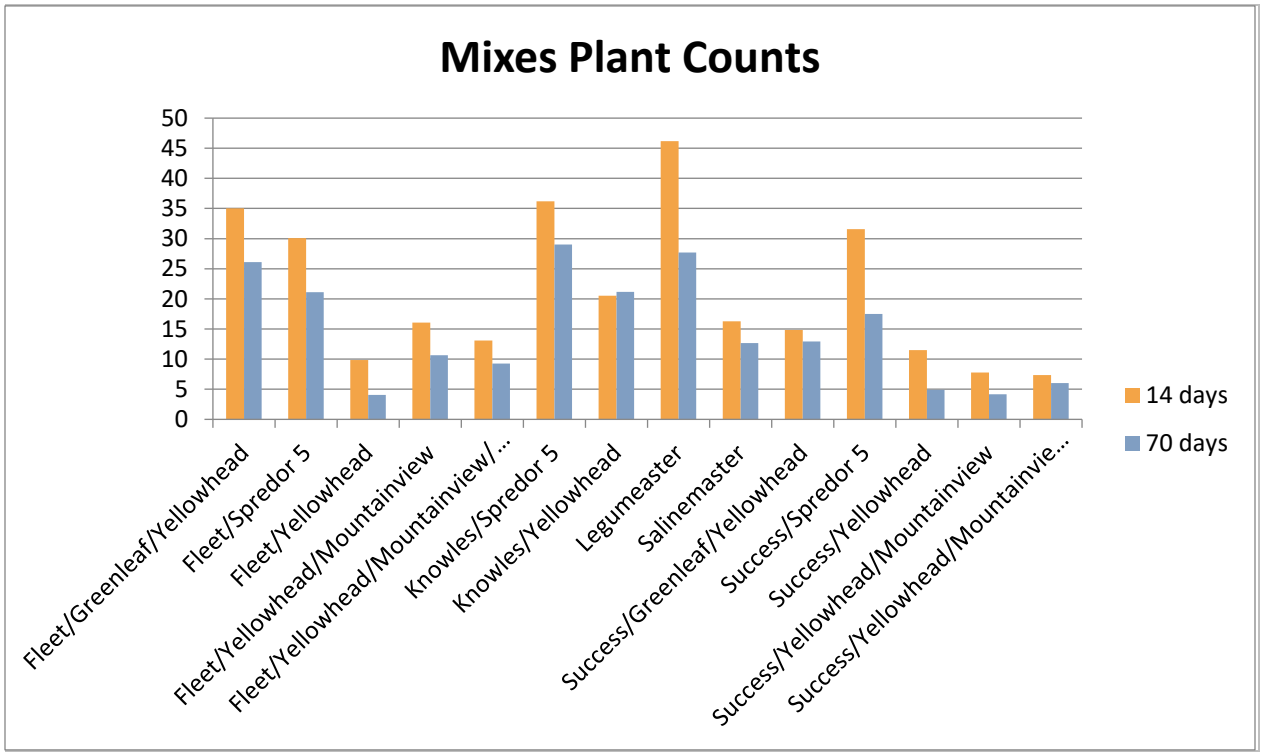

Figure 17. Average number of established mixed variety plants per 0.25m2 plot at 14- and 70-days post seeding for the Evaluation of Perennial Forage Mixes for Hay or Pasture Trial 2020

Grasses

Most grasses did not show loss over the season but rather an increase in density. The average blade count at 14 days was 35.4 for all varieties. The grass that established the best at 14 days was Grinstad with an average of 99.1 blades per sample plot. The least well established was Saltlander with 11.25.

By 70 days most grasses had become better established. The average for all varieties was 89.92 blades per sample plot. The best-established variety by 70 days was Rendita Italian Rye with an average of 421.75 blades per sample plot. Only two varieties of grass showed mortality over the fall season, these were Grinstad and AC Admiral. AC Admiral had the lowest average sample plot count with 4.8 blades.

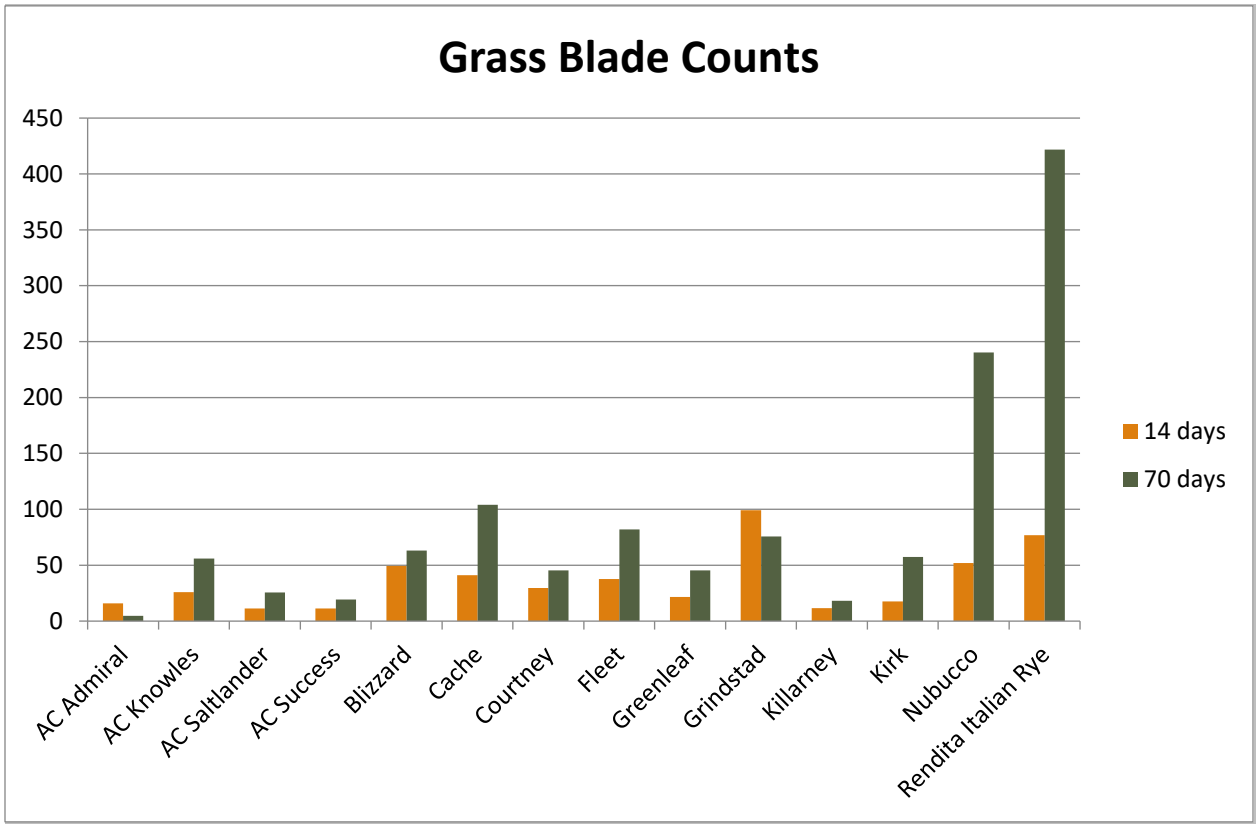

Figure 18. Average number of grass blades per 0.25m2 plot at 14- and 70-days post seeding for the Evaluation of Perennial Forage Mixes for Hay or Pasture Trial 2020

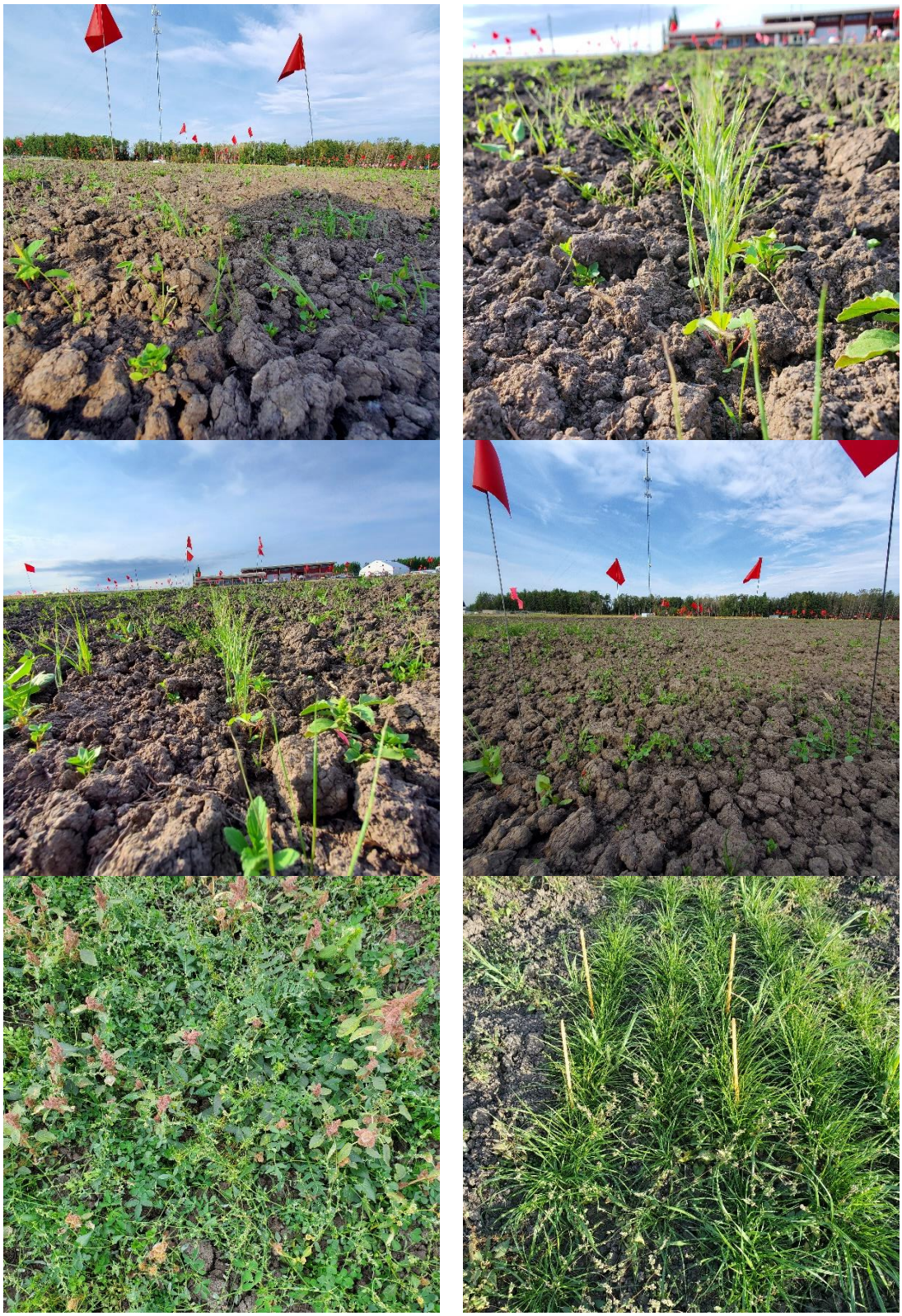

Figure 19. Perennial Forage Trails

Conclusion and Future Work

The seeding of the 2020 perennial forage trial at the Yellowhead County plots in Wildwood was the second attempt at achieving establishment for this trial. The weather for the latter half of 2020 was particularly warm with minimal snow cover. By the beginning of 2021 two long cold snaps of less than -30 degrees had been experienced. With almost no protective snow to blanket the young perennials there is concern for their survival.

In the spring of 2021 technicians will head back out into the field to do winter survivability counts on all blocks. It is expected that at least some grasses should survive. The PFT plots will continue to be monitored for health throughout the summer season of 2021. If the perennial varieties reach a height suitable for harvest, yield and quality samples will be taken.

2020 Soil Moisture in Forage Systems Update

Melissa J. Howard BSc., MSc., AIT

This project is supported by the Canadian Agriculture Partnership (CAP) Environmental Stewardship and Climate Change Program.

The soil moisture in forage systems project is concerned with determining the differences in soil moisture profiles amongst forage and crop production systems, the usefulness of soil moisture probe technology for WCFA producers, the effect of soil moisture on productivity, and the accuracy of Alberta Government soil moisture maps as compared to WCFA's moisture probes/weather stations. The project was initially proposed to begin in the spring of 2020. Due to staffing changes and the spring installation requirement the project is held up until spring of 2021.

The project utilizes weather stations provided by Martin Deerline to show changes in soil moisture at six different depths to 100cm. Each weather station is equipped to log the temperature, wind, precipitation and leaf wetness at its location. Weather stations are to be installed in one of each of the following forage or crop types, an annual silage, a perennial silage, a permanent pasture, and an annual cropland site. Each cooperator is given access to weather data updated hourly via app. Each producer will receive an info graphic at year end that shows the spring and autumn soil moisture profile, crop potential for the next season, and other pertinent weather data.

Four cooperators have been identified in each of Woodlands, Leduc, Lac Ste. Anne, and Brazeau counties. Currently two additional probes located in Yellowhead county will be accessed for weather data. WCFA will provide soil tests, feed quality analysis, and will analyze yield data provided by the cooperators for each field in use. Our partners at Martin Deerline will serve as intermediaries between app and information processors and the producer to ensure producers can have access to the data whenever possible.

The installation of weather stations, soil probes, and leaf sensors will occur in the spring of 2021 after cooperating producers have completed seeding (if applicable). Stations will be installed by an instrumentation technician provided by Martin Deerline. Once weather stations are operable cooperators and WCFA staff will receive login information and access to hourly data via mobile apps.

Stations will be removed the following spring of 2022 for installation at the new cooperator field's (if available). All cooperators will be surveyed on the usefulness of the technology prior to the end of the project. Soil moisture and precipitation data from each weather station will be compared to soil moisture and precipitation maps provided by the government for the same period of use. These will serve to demonstrate accuracy of map information provided to producers. The project will continue until February of 2023 when a final report will be generated to summarize all the data and provide an overview of the degree of usefulness that cooperators found the technology to have.

Figure 20. Photo of Soil Probes to be installed in 2021

2020 Soil Revitalization Project Update

Melissa J. Howard BSc., MSc., AIT

This project is supported by the Canadian Agriculture Partnership (CAP) Environmental Stewardship and Climate Change Program.

The soil revitalization project is concerned with how and if different forage systems or rotations build soil health. The project was designed to use four treatments and one check to determine how different forage regimes affect soil properties, more specifically if these forage treatments can help to increase carbon storage, soil nutrients, and soil microbial biomass.

The project was initially slated to get underway in the spring of 2020. Unfortunately, due to issues with the plots at Wildwood in Yellowhead County it was impossible to get the treatments seeded. Thankfully, producer Raymond Chittick stepped in and offered the use of his fields so that this trial could be seeded in a manner befitting its original intention.

In the spring of 2021 four treatments and one check will be seeded, preferably using a no till method, on five-acre parcels in Lac. Ste. Anne. County. The four treatments will comprise of 1) a three-crop rotation of triticale or oats, millet, followed by either triticale or winter wheat 2) a multi species mix comprised of at least 20-30% berseem clover 3) the 2nd year of a three-year rotation of a broad leaf (brassica) and grass (brome) 4) a perennial pasture blend and 5) a conventional cereal monocrop. Confirmed seed providers at this time include Union Forage, Corn Brothers, and Nutrien.

In the original project proposal green manure, in the form of trimming the forage, was to be performed in order to simulate grazing. In the new project protocol, each forage treatment will be grazed. The three-crop rotation will be grazed between forage crops.

Each forage crop will be sampled for yield, by method of using a test strip, feed samples will be taken from the test strip and sent to A&L laboratories for feed quality analysis. Soil will be sampled for nutrients, microbial community, bulk density, and infiltration prior to seeding and before grazing (where possible) in late summer or fall of each year of the project.

The project is expected to continue until the winter of 2023. Updates will be provided regularly through annual reports, update articles in Forage Views, on the website and social media, and hopefully in the coming year extension events will be permitted once again.

Alberta Soil Health Benchmark Monitoring Project Update

Provided by: Dianne Westerlund, Chinook Applied Research Association

This project is supported by the Canadian Agriculture Partnership (CAP) Environmental Stewardship and Climate Change Program.

Background

The project is designed to promote a better understanding of soil health and develop a provincial data base of physical, biological and chemical soil parameters, all of which contribute to an overall measure of soil health. The project will also measure the impact of various farmers' management practices on soil characteristics.

Chemical components of soil have been intensively evaluated by commercial soil testing labs in Canada, used primarily for chemical fertility recommendations. The role of soil biology, however, is not well understood and physical characteristics have not been monitored in detail. Evaluation of biological soil characteristics has only become available during the past few years in laboratories in the United States and more recently eastern Canada. Existing biological tests have not been calibrated and monitored specifically for Alberta soils. CARA's Soil Health Lab, under the direction of Dr. Yamily Zavala, provides a unique service in evaluating soil health constraint indicators. A biological and physical baseline developed within the province will provide a framework which can help define strategies for managing and improving the productive capacity, and sustainability, of our soils. Understanding and managing for a diverse micro-biological functional group underground may contribute to an overall healthier soil by improving soil aggregation, soil water infiltration and storage as well as improved carbon sequestration. The improved aggregation stability will also contribute to enhanced carbon sequestration levels in the soil. Healthy soils produce healthy plants resulting in a higher quality food product. Understanding soil health will give Alberta producers a valuable tool for use in making strategic management decisions on their farms and ranches. Sustainable productivity of a soil is a function of physical, chemical and biological soil functions.

Participating organizations include:

- Battle River Research Group (BRRG)
- Chinook Applied Research Association (CARA)
- Farming Smarter (FS)
- Foothills Forage and Grazing Association (FFGA)
- Gateway Research Organization (GRO)
- Grey Wooded Forage Association (GWFA)
- Lakeland Agricultural Research Association (LARA)
- MacKenzie Applied Research Association (MARA)

- North Peace Applied Research Association (NPARA)
- Peace Country Beef and Forage Association (PCBFA)

Methodology

CARA's Soil Health Sampling Protocol, developed by Dr. Yamily Zavala is used for collecting samples and site information. CARA provided Soil Health Sampling kits with all the necessary tools for site evaluations and sample collection to each participating association.

At each site the field history is documented, along with GPS coordinates for each location samples are retrieved from. Samples are evaluated for a number of physical, biological and chemical parameters either on-site, at the CARA Soil Health Lab, or through a commercial lab.

Physical parameters include compaction and infiltration, both measured in-field. Wet aggregation stability, bulk density and texture are also assessed. Biological parameters include active carbon, C:N ratio, total carbon, total organic carbon, microbial respiration, active & total bacteria, active & total fungi, as well as nematode & protozoa functional groups. A complete fertility assessment, which includes macro- and micro-nutrients, organic matter, pH, etc. is also conducted on each sample.

Information for all samples is being entered into a database by the CARA Soil Health Lab. Management changes are documented so they can be linked to changes in soil health indicators over time.

Progress to Date

Staff from all participating organizations have visited fields and pastures across to do on site evaluations of compaction and infiltration and to collect samples for lab assessments. 1297 samples have been processed to date (606 in 2019 and 691 in 2020). These samples were collected by the 11 partnering associations on 713 fields belonging to 331 farmers and/or ranchers. Reports for each field have been shared with the associations and their cooperating producers. Dr. Yamily Zavala has met with several of the farmers through webinars to discuss the reports.

Data from the sites is being compiled into a large data base. Management practices farmers are using at each of the sites will be monitored during the next few years. Sites will be revisited to determine the impact of management during the 2019-2022 period.

Table 13. Summary of Soil Health Benchmark samples by Association for 2019 and 2020

Organiz-ation	2019			2020			Total		
	Farmers	Fields	Total Samples	Farmers	Fields	Total Samples	Farmers	Fields	Total Samples
BRRG	1	1	1	16	22	38	17	23	39
CARA	23	47	56	21	43	185	44	90	241

Organiz-ation	2019			2020			Total		
	Farmers	Fields	Total Samples	Farmers	Fields	Total Samples	Farmers	Fields	Total Samples
FS	14	31	38	21	35	57	35	66	95
FFGA	13	54	82	7	24	36	20	78	118
GRO		23	34	8	17	28	8	40	62
GWFA	10	19	26	19	32	34	29	51	60
LARA	8	20	38	0	0	0	8	20	38
MARA	0	0	0	22	27	94	22	27	94
NPARA	17	38	48	10	23	27	27	61	75
PCBFA	18	78	155	24	26	68	42	104	223
WCFA	**9**	**15**	**20**	**28**	**44**	**72**	**37**	**59**	**92**
Other	25	58	108	17	36	52	42	94	160
Total	**138**	**384**	**606**	**193**	**329**	**691**	**331**	**713**	**1297**

Figure 21. Compaction Measurement using Penetrometer (Left), Infiltration measurement (right)

Sire-Progeny Links in Commercial Herds Project Update

Evaluating Sire-Progeny Links, Breeding Plans and Information Management in Multi-Sire Breeding Scenarios on Commercial Herds

Jessica Watson, BSc. Ag

This project is supported by the Canadian Agriculture Partnership (CAP) Adapting Innovative Solutions in Agriculture Program.

Background

One of the more commonly used natural breeding systems in commercial herds is the multi-sire system. One of the major disadvantages to this system, however, is that producers are often unaware of which bulls are siring calves. The use of genetic technology to assign parentage may allow producers to determine which bulls have sired calves and in turn better evaluate if they are achieving their breeding and genetic improvement goals.

The assumption in these systems is that each bull is breeding an equal number of cows. However, without identifying which bulls are siring calves, it is impossible to know with certainty if this is the case. The introduction of desirable genetic traits in commercial herds is typically achieved through purchase of bulls. By linking bulls to their offspring, producers can better evaluate if they are achieving the desired outcomes of their breeding plans while using multi-sire systems.

This multi-year project will demonstrate the benefits of a systematic approach to breeding and how sire-progeny and other herd performance information can be used to generate measurable productivity and profitability improvements.

Participating organizations and individuals include:

- Lakeland College
- Olds College
- Dale Kaliel
- Quantum Genetix
- Five WCFA Area Producers

Methodology

Seven herds are evaluating the use of the Q-link bull performance and herd improvement tool from Quantum Genetix. Five of these herds are associated with ranchers in the west-central region of Alberta. The remaining two herds are associated with Lakeland and Olds Colleges.

Each year, ranchers are asked to provide a minimum of 100 calves (if possible) for parentage verification through DNA testing. All bulls in the test groups must pass a yearly breeding soundness exam, which includes testing negative for venereal disease. Ranchers are asked to provide additional production information to be used to fully analyze the use of genetic testing for parentage on farm. Additional herd information required includes:

- Birthweights (when available)
- Birthdates of calves (if this is not possible calving start and end dates are required)
- Calving ease scores
- Calf weaning weights
- Weight and Body Condition Scores of cows at weaning
- Any losses (calves, cows, etc.)
- Length of breeding season
- Number of open cows in the test group
- Number of cows in the test group
- EPDs for all bulls, along with bull age

Sires are to have DNA collected once in their lifetime, and any new bulls added during the project must have their DNA collected and submitted to the lab. DNA for sires is collected using a hair sampling procedure.

Calves are to have DNA collected through an ear tissue sampling procedure. These samples are often collected during other management procedures (branding, weaning, when tagging at birth, etc.)

Figure 22. Photos: Tissue collection tool (left); Ready to collect tissue sample (right)

Progress to Date

In 2019 WCFA's cooperating herds sampled 343 calves for parentage identification. In 2020 the cooperating herds submitted 372 samples for parentage identification. Both the Lakeland College and Olds College herds submitted over 100 samples in 2019 and 2020 for parentage identification. Many of WCFA's herds have not met the minimum 100 sample requirement of the project due to a number of factors.

All results and additional required data are being compiled and Lakeland College will be starting an in-depth analysis. Results from 2019 were compiled with the assistance of BIXs. Data collection will continue in 2021 and 2022.

COVID-19 limited the amount of extension activities in 2020, but we will be looking to provide more information on this project moving forward.

Figure 23. DNA samples from calves ready to ship to lab

Rancher Researcher Enhancing Technology Adoption Project Update

Jessica Watson, BSc. Ag

This project is supported by the Canadian Agriculture Partnership (CAP) Adapting Innovative Solutions in Agriculture Program.

Background

The Rancher Researcher Enhancing Technology Adoption Project is an expansion of a Rancher/Researcher Pilot project which monitored the adoption of up to 3 innovations by 8 ranchers in south central Alberta.

Several targeted areas were evaluated, including soil, forage and economic parameters, for assessment of the impact the innovations made to the individual ranch operations. The ranchers were provided with the opportunity to consult with various scientists to further their understanding of the new technologies. They were encouraged to participate in Alberta Agriculture's Agriprofit$ program, which although onerous, provided enlightening results for their operations.

The pilot project demonstrated that an enhanced understanding of the ranch operation can improve the outcomes of adopting an innovation. Ranch participants also acknowledged the importance of collecting and utilizing production and financial data when making decisions on management change.

This goal of this expansion project is to provide a framework for enhancing adoption of recent innovations related to the management of cow/calf, backgrounding or feedlot operations in Alberta.

Participating organizations include:

- Foothills Forage and Grazing Association (FFGA)
- Peace Country Beef and Forage Association (PCBFA)
- North Peace Applied Research Association (NPARA)
- MacKenzie Applied Research Association (MARA)
- Gateway Research Association (GRO)
- Battle River Research Group (BRRG)
- Lakeland Agricultural Research Association (LARA)
- Grey Wooded Forage Association (GWFA)
- Chinook Applied Research Association (CARA)

Methodology

Producer associations in the province will each interview and work with 2 local ranchers to provide guidance and context in order to select appropriate technologies or management practices new to that operation which should provide maximum net return on investment. They will also facilitate connection to expertise in that topic area and then monitor the use and impact of the technologies.

Ranchers agreeing to the project purposes outlined will receive assistance to collect benchmarking data using the GOLD indicators. This basic assessment covers the cattle production and efficiency aspect of the ranch. In addition to the production related benchmarks, participants will have the option to investigate economic aspects of their ranch using the cost of production tool Agriprofit$.

Progress to Date

Interviews were conducted with two area producers. These producers will begin implementation of their selected innovations in early 2021. Economic and production related data will be collected each year in order to effectively evaluate the impact of their innovations in their operations.

EXTENSION

2020 Extension & Member Services Highlights

JESSICA WATSON, BSC. AG

Our 2020 extension program looked quite different than it has in previous years. Normally, you would find a comprehensive description of the various workshops, seminars and tours we hosted throughout the year in this section. The arrival of COVID-19 significantly impacted our ability to deliver programming in the way we typically would have, and as such there are very few extension activities to report on for the year 2020.

Ladies Ranching Retreat

JANUARY 31, 2020

This was the third year we hosted this annual event geared specifically towards the women of our farming and ranching communities. This year's event was hosted at the incredible Heritage Park facility in Stony Plain. Over 50 farming and ranching women took in a number of sessions throughout the day including:

- Grazing Cows with Creeks & Wetlands
- The People Side of Things
- Healthy Calves, Healthy Profits
- Up Close and Personal: Journeys of Women in Ranching (Panel Discussion)
- The Success-Energy Equation (Keynote)

Figure 24. Ladies Ranching Retreat - Keynote speaker

Establishing New Forages

FEBRUARY 20, 2020

Continuing on the success of our 2019 fall seminar series, we planned another series for the spring of 2020. Unfortunately, we were only able to host one session before COVID forced the cancellation of in-person events.

Rianne Bouma of Nutrien Ag Solutions presented some tips for establishing new forages, planning, and variety selections with members during this evening session.

Newsletters

Three issues of the *Forage Views* newsletter were published in March, August and December of 2020. *Forage Views* provides information on our projects, upcoming events, industry news and other topics of interest. Members receive a copy of the newsletter directly to their inbox/mailbox.

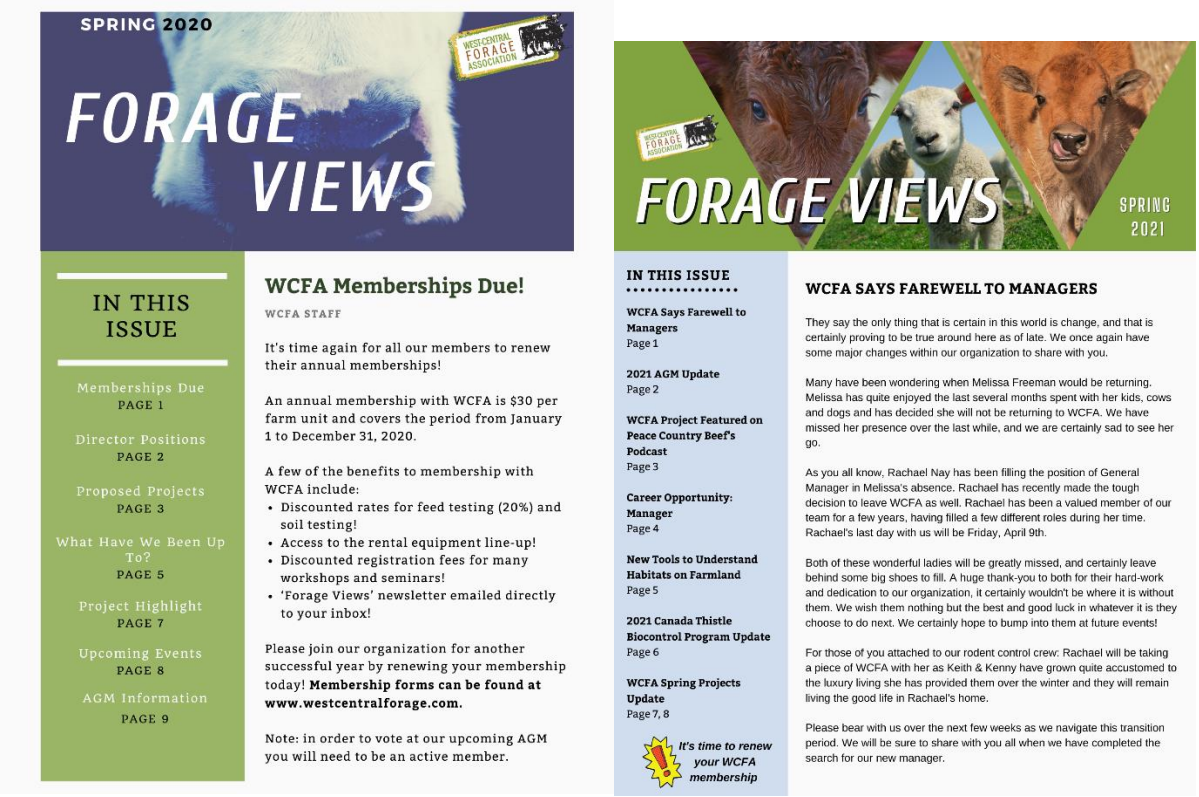

Figure 25. Examples of newsletters produced in 2020

Environmental Farm Plans

Over 16 EFPs were started by local producers in 2020, and a number of other producers were assisted with their EFP questions.

Feed Testing

67 feed samples submitted by local producers in 2020.

CONSERVATION AGRICULTURE

Stewardship Alliance for Conservation Agriculture (SACA)

Enhancing Stewardship and Conservation within Agriculture

What is the Stewardship Alliance for Conservation Agriculture (SACA)?

The Stewardship Alliance for Conservation Agriculture (SACA) is a partnership between WCFA, Yellowhead County and Woodlands County. This partnership has been in place since 2012, following a restructuring of the previous group known as the West-Central Conservation Group (WCCG).

Through this partnership, our goal is to assist the agricultural community to find practical, environmentally sustainable practices and raise awareness through workshops, information sessions, demonstrations and projects.

Through this partnership we are able to deliver programming to support local producers in achieving their stewardship goals, which includes:

- Delivery of the Alberta Environmental Farm Plan (EFP) program
- Support with funding applications to programs such as the Environmental Stewardship and Climate Change program from the Canadian Agricultural Partnership (CAP)
- The Canada thistle biological control agent program
- Delivery of Pond Days and Classroom Agriculture presentations to local schools

The SACA partnership also allows for projects to be developed in response to needs identified by the local communities, such as the Shiningbank Lake Community Stewardship Initiative, which wrapped up in 2019. Past projects have included work near Chip Lake, the Paddle River and the Lobstick River.

To connect with SACA please contact:
Conservation Agriculture and Extension Program Coordinator, Jessica Watson
conservationag@westcentralforage.com
780-621-8670

SACA Programs

Canada Thistle Biocontrol Agent Program

Background

Each year WCFA/SACA works with a large number of individuals throughout the province to tackle Canada thistle infestations through the use of biological controls.

Canada thistle is listed as 'noxious' on Alberta's weed control act, meaning it must be controlled. The use of biological control agents to do so has become increasingly popular in recent years. Interest in our program has continued to grow, often putting a strain on our suppliers to meet the high demands.

We currently facilitate the importation and delivery of two biological control agents for Canada thistle: stem-mining weevils and stem-gall flies.

Why Biocontrol?

It is a method of control that is specific to the target plant, i.e. Canada thistle, and will not move to economically important crops (pasture, etc.). It has the ability to infest plants in inaccessible areas. Once established the agents are self-perpetuating, and have the potential to migrate to other locations (thistle patches). Once established it is also a very cost-effective method that is often less expensive and labour intensive than chemical or mechanical methods of control. The goal of Canada thistle biocontrol is to reduce plant vigor and its dominance in the landscape. It is not to completely eradicate the thistle, as it is very unlikely that the use of biocontrol agents alone will be able to achieve this.

Notes about Biocontrol

In the most successful examples of biological control there are always a small number of plants that do not fully succumb to the attack of the beneficial insect. This is good. It allows the insect population to sustain itself during years of low weed density. Once the weevils have exhausted a thistle patch, they will migrate to look for more food, for example.

Biological control insects alone are not the answer. Without healthy stands of desirable vegetation to take the place of undesirable weeds, bio-control cannot be successful. As the insects reduce the weed population, useful plants take their places and gain a competitive advantage. Together, bio-control agents and competing vegetation will reduce weed infestations. Encouraging desirable plants, by re-seeding or reducing grazing pressure, will greatly help the insects do their job.

Stem-Mining Weevils

The Canada thistle stem-mining weevil (*Hadroplontus litura*) occurs naturally in France, Switzerland, Austria, Germany, Britain, and southern Scandinavia. It was first introduced into

Canada as a biological pest control agent in 1965 and into the US in the early 1970s. WCFA has been importing these agents from Montana for producers for over ten years.

Stem-mining weevils are intended to act as a permanent, self-perpetuating control mechanism for Canada thistle. These insects restrict their feeding to Canada thistle only.

How do they work?

Eggs are laid in the mid-vein of the rosette leaves in early spring, and hatch after five to nine days. Larvae internally mine the inside of the stem of the thistle plant as the shoot elongates during the summer. Fully developed larvae will exit the plant at the root and enter the soil to pupate. They will emerge again in their adult form later in the summer, and feed on thistle leaves before winter. Adults will over winter in the soil, ready to attack the emerging thistle the following spring.

2020 Weevil Program

Due to COVID-19 and the border closures, we were unable to take orders for or deliver weevils in 2020.

Stem-Gall Flies

The Canada thistle stem-gall fly (*Urophora cardui*) is native to Europe, but has been used in Canada for control of Canada thistle since around the 1970s. WCFA has been importing these agents from Montana for producers since 2017.

How do they work?

The stem-gall fly attacks the stem of the thistle plant, boring in and causing the plant to form gall tissue. Females lay their eggs on the apical meristem (tip) of developing shoots in the early summer, and larvae burrow into the shoots. Larval feeding triggers gall formation, which stresses the plant. The gall becomes a nutrient sink, directing nutrients away from the plant's normal metabolic & reproductive functions, lowering normal plant function and reproduction. Abnormally developed flower heads frequently occur above the gall, resulting in fewer flowers and lowered seed production. Galls vary in size, depending on the number of larvae present within. Galls may range in size from small (marble) to large (walnut/plum), containing anywhere from three or four larvae to upwards of 25 larvae. The flies overwinter in the gall as mature larvae and emerge as adults in the spring (around June) when the gall tissue deteriorates.

2020 Gall Fly Program

A limited number of releases were ordered in early 2020, but due to COVID-19 and the border closures, we were unable to deliver gall flies in 2020. Any orders that had been placed with us had to be refunded.

Additional Programs Supported by WCFA & SACA

ALUS Partnership Advisory Committees

The ALUS program works with farmers to produce valuable ecological services on Canadian farmland. More specifically, ALUS helps farmers and ranchers restore wetlands, reforest, plant windbreaks, install riparian buffers, manage sustainable drainage systems, create pollinator habitat and establish other ecologically beneficial projects on their properties. What's more, ALUS provides per-acre annual payments to ALUS participants to recognize their dedication to managing and maintaining all the ALUS projects on their land.

As ALUS is a community driven program, each active ALUS community establishes a local Partnership Advisory Committee (PAC) to direct local programming. The PAC includes a broad spectrum of community members, such as representatives from local environmental groups, local government agencies and local industry. Approximately 50 percent of each PAC is made up of farmers.

WCFA has been a member of the ALUS Brazeau PAC since 2016 and will continue to support this program moving forward. In 2020 we joined Parkland County's ALUS PAC as well. We appreciate the opportunity to support these local programs.

We would also like to note that although we are not members of their PACs, we work closely with and are strong supporters of the other ALUS programs in our area, which include ALUS Lac Ste. Anne and ALUS Leduc-Wetaskiwin.

If you are interested in the ALUS program we encourage you to contact your local ALUS coordinator.

Alberta Environmental Farm Plan (EFP)

The Environmental Farm Plan (EFP) is a voluntary, whole farm, self-assessment tool that helps producers identify their environmental risks and develop plans to mitigate identified risks.

We have an EFP Technician on staff available to assist area producers through all stages of the EFP process and help them achieve their stewardship goals.

For more information on the EFP program contact Jessica at 780-621-8670 or conservationag@westcentralforage.com.

Canadian Roundtable for Sustainable Beef (CRSB)

The CRSB was established in 2014 by a community of stakeholders devoted to fostering continuous improvement and sustainable practices across the Canadian beef value chain.

The CRSB's objective is to promote sustainability throughout the Canadian beef industry through three pillars of focus:

1. Sustainability Benchmarking
2. A voluntary Certification Framework
3. Sustainability Projects

WCFA is proud to be a member of the CRSB. In 2020 we were active participants in the Certified Sustainable Beef Framework Committee, which oversees the delivery of CRSB's Certified Sustainable Beef Framework (an operation-level certification program developed by the CRSB).