

Forage Facts



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DID YOU KNOW?

In 2020,
68% of Canada's
beef was
produced in
Alberta

Grant Gaschnitz Memorial Ag Knowledge Sponsorship Recipient

By Monika Benoit

The recipient of the 2022 Grant Gaschnitz Memorial Ag Knowledge Sponsorship was recently announced at the Peace Country Beef and Forage Association's AGM on March 18th. Elly Beamish of High Prairie was the recipient of this year's award, which was put together in 2019 by the Gaschnitz family in Grant's memory. Elly will receive a \$500 sponsorship to be used to further her agriculture knowledge.

Grant Gaschnitz was a prominent figure of the Peace Country agriculture community. Grant was passionate about agriculture, beef cattle production in particular, and he had a special interest in supporting young people who were starting out in their farming and ranching

careers. Grant always encouraged young producers to work on advancing their knowledge of the industry to help them run more productive and profitable operations. He was a very active member of the Peace Country Beef & Forage Association (PCBFA), being awarded a lifetime membership in 2019. Grant could always be found promoting educational opportunities through PCBFA and other local and provincial organizations. Many admired Grant for always being willing to consider new ideas and try new things on his own farm. The Gaschnitz Family is very proud to provide this opportunity to the Peace Country's young - Continued on Page 3 -





Grant Gaschnitz Memorial Sponsorship Recipient

producers and continue Grant's legacy of promoting life-long learning.

An inspiring set of applications was received for this year's sponsorship, and selecting a winner wasn't an easy task. This year's recipient, Elly Beamish of High Prairie stood out for her immaculately written application and her commitment to contributing back to the agriculture community once her education is complete.

Elly Beamish is a fourth-generation producer who is proud to carry on the tradition of a farming lifestyle. Elly has been on the family farm her entire life, where her family raises cattle and sheep. She has her own herd of beef cattle, and the sheep are a recent addition to the family farm and a venture she has taken on with her brother. Elly values lifelong learning and is passionate about increasing her animal health and husbandry knowledge to better care for her livestock. Elly has been ac-

cepted into Lakeland College's Animal Health Technology program for the fall of 2022. During this 2-year program Elly will learn a variety of veterinary medicine skills and procedures and improve her abilities to help animals needing care. Upon graduation, Elly plans to return to the Peace Country and is keen to bring her knowledge back to the family farm as well as to the rest of the ag community. Elly has identified that there is a lack of veterinary services in the region and aspires to help to fill this gap. Elly also plans to continue the family tradition of bringing animals into school settings to share her knowledge about animals and agriculture with the next generation.

Donations can be made to the sponsorship fund to support the young farmers and ranchers of the region at any time. Details can be found on the Peace Country Beef & Forage Association website, www.peacecountrybeef.ca under the Scholarship tab.

I am Louise Liebenberg, I was born and raised in South Africa and started in the sheep business there. I then traveled and lived in The Netherlands for the next 18 years running a large grazing business, with sheep and cattle. Helped start the first Shepherding School and did a variety of other activities with Rare Livestock breeds, specialized grazing projects and working with both herding and guardian dogs.

In 2008 my family and I emigrated to Canada and started our sheep and cattle ranch in High Prairie. My daughter, Jess Verstappen and I run around 120 purebred and commercial red and black angus cattle and a few hundred sheep. We own and rent in total about 1400 acres of land. Most of the land is used for winter forage for the animals.

I got involved with the PCBFA almost directly when we moved to Canada and have since then been a member. I have always valued the work PCBFA does and I look forward to contributing my time to this organization. I have a very global view on things and have a pioneering attitude. I am not afraid to try new things, explore possibilities and delve a little deeper into research. I see many challenges ahead for ranchers including things like price competitiveness, climate change, veterinary challenges and other issues. I think we need the PCBFA even more moving forward to help as navigate these challenges and changes heading in our direction.



Meet Our New Board Members



My name is Kasity Bilous, I grew up in Wanham Alberta. I can honestly say I never thought I would be a farm girl. I had helped on my friend's family farm in Tangent Alberta as a kid, but it never seemed like an option for me. I was a "town kid" but I do remember loving it! I moved around a lot in my Teen years, and it made me hunger for the small-town life I knew and loved. In 2015 I started farming with the Bilous's on their ranch, fell head over heels for my best friend and started on this path of immense growth. I can say I am now a proud 3rd generation farmer on our ranch. We run about 300 head of mostly angus, and I can tell you that Corb Lund was right, Everything is better with cows around!

I attended my first PCBFA AGM in 2016. I knew almost immediately that I wanted to be part of this team, their energy, drive and thirst for knowledge really spoke to me and pulled me in. It took me a few years to build my courage, but I am so proud to be serving on the board and I hope to bring as much to the table as I can.



Kyle Davies is excited to be part of PCBFA board of directors. He grew up here in the Peace Country on a farm outside of Brownvale, AB and currently lives, along with his wife, Laurel, and daughter Renley on the family farm he grew up on.

Kyle's background includes going off to university to pursue a degree in science obtaining an undergraduate degree in Chemistry with a minor in Biology at the University of Alberta and eventually receiving a second degree in Environmental Earth Science with honors. Following his education, he returned north to pursue a career as an environmental scientist. He has over 10 years conducting environmental site assessment, collecting soil and water samples, reviewing laboratory data and preparing technical reports for clients in a variety of industries.

Subsequently, while pursuing a career as an environmental scientist Kyle returned to farming with his parents. He began small with his own cow herd and started attending field days and workshops primarily hosted by PCBFA. He caught the fever and began reading books on regenerative agriculture, soil health and sustainability. Kyle and Laurel purchased the family farm in 2021, and currently operate a mix farm of about 1400 acres running approximately 120 cow/calve pairs (combined with his parents and brother) and growing a cereal grain on a few hundred acres on the side.

By: Monika Benoit

In our northern climate, warm-season crops aren't often at the top of the list for Peace Country producers, however, they can offer a range of benefits and be a tool for a rancher's feeding options. The summer of 2021 brought record-high summer temperatures that warm-season crops flourish under, and additionally, certain warm-season crops can be a great fit to include in a cocktail cover crop to add more diversity to a blend.

The three main benefits that warm-season C4 plants can provide include:

1. They provide a higher quality forage that better meets beef cattle nutritional requirements compared to traditional cool-season cereal species, and yield is comparable or only slightly less.
2. They have good potential to add diversity and soil health benefits to cocktail cover crop mixtures.
3. They can help to extend the grazing season and be useful for fall and winter swath grazing as well as for use as silage.

PCBFA has been conducting research on the suitability of warm-season C4 grass species for feed for a number of years. Trials have been conducted across the Peace, including in High Prairie, Teepee Creek and Fairview. A 2-year trial was done at the Fairview Research Farm in 2017 and 2018 looking at 10 different species and varieties of warm-season crops. PCBFA has also conducted numerous studies looking at the performance of warm-season plants in cocktail mixtures for forage. This research has shown that there are several species that Peace Region producers can consider if they would like to include a warm-season plant in their seeding and feeding plans.

What is the difference between warm and cool season grass species? Warm-season grasses are categorized as C4 plants, whereas cool-sea-

son grasses fit under the C3 category. The simplest way to describe the difference between C3 and C4 plants is that C4 plants process carbon dioxide (CO₂) in a more complex way, and they can process more CO₂ in hot, dry conditions. C4 plants thrive under hot, dry conditions, but don't do as well in cooler, wetter years. (<https://www.grainews.ca/features/the-difference-between-c3-and-c4-plants-and-what-it-means-for-prairie-agriculture>) Higher soil and air temperatures are needed for good germination, growth and production of C4 plants, so they need to be seeded after the last spring frost dates; these crops are highly susceptible to frost at all growth stages.

In the 2-year trial conducted at the Fairview Research Farm, 10 warm season varieties of various C4 plants were chosen and compared against Maverick barley and Haymaker oats:

- Siberian red foxtail millet
- Golden German foxtail millet
- Japanese foxtail millet
- Pearl millet
- Forage sorghum hybrid
- BMR Sorghum Sudangrass
- Grazex Sorghum Sudangrass
- Teff
- White proso crown millet
- Red proso crown millet

Agronomic Considerations for Warm-Season C4 Plants in the Peace Country

Optimal soil temperature for seed germination is between 20C and 30C, and should be at least 10C at seeding depth (approximately 2 inches). The favorable growth temperature for C4 crops ranges from 25C and 30C. In the research trials that PCBFA conducted, seeding dates generally occurred at the end of May, and into early June.

A Viable Feed Option in the Peace Country



Table 1. Seeding rates and ideal harvest stages

Crop Species/Variety	Seeding Rate lbs/ac	Harvested Stage
Siberian red foxtail millet	20-22	First awns visible - tip of ear just visible
Golden German foxtail millet	10-15	First awns visible - tip of ear just visible
Japanese foxtail millet	20-25	Boots just visible – flag leaf sheath opening
Pearl millet	8-10	Tip of head just visible
Forage sorghum hybrid	25	Head half emerged
BMR Sorghum Sudangrass	25	Head half emerged
Grazex Sorghum Sudangrass	25	Head half emerged
Teff	7	Flowering complete
Red & White proso crown millet	20-25	Early to late milk

Yield Overview

In the PCBFA trials involving C4 plants, the warm-season crops that show the most promise for high yields are sorghum sudangrass and proso millet varieties. When compared with C3 plants, the yield data has generally come back with the C3 plants out-yielding the C4 plants. In the 2-year trial looking at 10 different C4 plants with oats

and barley as check species, the oats and barley had the highest yields on a dry matter (DM) basis. The next highest yielding species was both varieties of sorghum sudangrass, with the BMP variety yielding the highest and the Grazex variety close behind. Table 2 shows the DM yield data from this trial.

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Table 2. Dry matter yield, Crude Protein, Total Digestible Nutrients In a 2018 trial also at the Fairview

Crop Species/Variety	Dry Matter Yield (t/acre)	Crude Protein (%)	Total Digestible Nutrients (%)
Oats	3.73	11.7	62.9
Barley	3.67	11.5	66.8
Siberian red foxtail millet	2.08	16.5	63.6
Golden German foxtail millet	1.74	16.5	62.8
Japanese foxtail millet	2.31	14.5	64.5
Pearl millet	0.55	15.0	65.3
Forage sorghum hybrid	0.87	18.5	66.6
BMR Sorghum Sudangrass	3.19	16.9	66.1
Grazex Sorghum Sudangrass	2.65	19.4	65.9
Teff	1.30	20.0	69.3
Red & White proso crown millet	2.63/2.44	14.0/14.6	64.8/65.2

Research Farm that looked at alternative annual forage-type crops for forage production, sorghum sudan grass out-yielded the Haymaker oats: the sorghum sudangrass ran 4.02 MT/acre, dry matter (DM), whereas the oats yielded 3.8 MT/ac, DM. In this same trial, the white proso millet wasn't far behind at 3.6 MT/ac, DM. 2018 was a very dry year in the Fairview area where the rainfall during the growing season was only 213.8 mm, which is less than half of the long-term average of 445.9mm. Proso millet is earlier maturing than the other C4 crops, showing that it may be an ideal species to replace an earlier seeded crop failure; it is also known for its drought tolerance.

Overall, it can be expected that warm-season crops will yield lower than conventional, cool-season crops, however, the PCBFA trials show that the C4 plants have potential to yield similarly and

quite likely yield higher in drier, warmer growing seasons.

Nutritional Quality

PCBFA's trials on warm-season C4 plants have shown that these crops produce high quality feed, with protein and energy levels generally meeting and often exceeding requirements for beef cows and growing beef cattle. In the 2-year trial in Fairview, teff had the highest crude protein (CP) value at 20%, followed by sorghum sudangrass, Grazex variety at 19.4% CP. Both C3 control crops had the lowest protein values in the trial, ranging from 2.3% lower up to 8.5% lower. In other trials conducted by PCBFA, C4 crops also consistently showed high protein values, indicating that warm-season cereals, particularly varieties of millet and sorghum sudangrass that consistently show yields not much lower than cool-season

cereal crops can be a viable way to grow a high protein forage in the Peace Country, particularly for backgrounding and finishing calves. Their use could also minimize the need for protein supplementation during winter feeding of cow herds.

The C4 plants also showed high energy levels in trials. When looking at the TDN (total digestible nutrients) values for the C4 crops in the 2-year trial in Fairview, all species had a minimum of 63% TDN, which exceeds the requirements for all stages of pregnancy of a beef cow (55%-60% TDN) and almost meets the 65% TDN requirement of a lactating beef cow. Teff stood out as having the highest TDN at 69%, the sorghum sudangrass varieties had TDNs of 66%, and both proso millet varieties showed 65%. The data from other trials also showed similar TDN levels, demonstrating that C4 crops have excellent potential for providing a high energy forage.

When it came to comparing the mineral levels in each of the tested varieties, there was a wide variance across the species tested in all trials. In the 2017-2018 trial, for most of the microminerals tested for, the C4 crops generally had higher forage Ca, P, K Mg, Cu and Fe values compared with the C3 crops. The sorghum sudangrass varieties and teff had the highest calcium levels, high enough to meet the requirements of a lactating beef cow.

Nitrate and prussic acid risk

Like cool-season annual forages, warm-season grasses pose a risk for nitrate poisoning if they are being used for fall or winter feeding. When grazing annual forage around the time we start getting frosts, nitrates become a concern. Nitrates accumulate in the plant when it suffers damage that hurts the plant, but does not kill it. This can be caused by light frost, hail, and even by extreme prolonged weather events like severe heat and drought, or prolonged rainy cold periods. Nitrate accumulation is something to keep an eye out for

and levels can be tested with a feed test upon request.

Plants from the sorghum family have an additional risk factor and can cause prussic acid poisoning. These plants contain dhurrin, a glucoside that breaks down to release hydrocyanic acid, or prussic acid. Similar to nitrate poisoning, a sudden disruption of growth such as frost, drought or cutting causes prussic acid to be released inside the plant at a more rapid rate. High prussic acid levels may be lethal to cattle. Prussic acid will break down in one to two weeks, so hay, silage or swath grazing is safe to feed.

A tool to consider for increasing nutrient quality in the Peace Region

The trials PCBFA has conducted show that warm-season C4 plants are a valuable tool for producing high quality and moderate yielding annual forage crops. Red and white proso millet and the sorghum sudangrass varieties BMP and Grazex showed the highest yield potential of the C4 crops and had higher nutritive values compared to both oats and barley. The trial completed in 2017 and 2018 shows that teff, while producing low forage yields, had the highest protein and energy and mineral levels of all species trialed, making it an interesting species to consider when the goal is to produce a feed crop with high protein, energy and mineral levels. These crops are recommended for use as monocultures, as well as for inclusion in multispecies annual crop mixtures in the Peace Region.

This article was adapted from the 2018, 2019 and 2020 PCBFA Annual Reports as well as the published paper: Akim Omokanye, Guillermo Hernandez, Herbert Lardner, Kabal S. Gill, Buthaina Al-Maqtari & Alan Lee (2021) The evaluation of warm-season annual grasses as alternative sources of forage crops for beef cattle diets under northwestern Alberta conditions, Journal of Crop Improvement.



Member Information

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Member Soil Testing Service

PCBFA Members receive 1 free basic soil test or 2 free feed tests with their membership.

All soil tests are sent to Element Materials Technology in Grande Prairie and tested for macro & micro nutrients, organic matter, acidity, and cations.

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\$50/sample

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Get in Touch with Our Staff

Liisa Jeffrey

Executive Director

e: liisa@pcbfa.ca

p: 780-394-7419

Dr. Akim Omokanye

Research Program Manager

e: akim@pcbfa.ca

p: 780-835-1112

Chelsey Hostettler

Farm Projects Coordinator

e: chelsey@pcbfa.ca

p: 780-834-8780

Katie McLachlan

Extension & Office Manager

e: katie@pcbfa.ca

p: 780-772-0277

Dr. Blasius Azuhnwi

Research Associate

e: blasius@pcbfa.ca

p: 780-835-6799

Buthaina Al-Maqtari

Research Technician Lead

e: buthaina@pcbfa.ca

p: 403-667-2219

Johanna Murray

Extension Coordinator

e: johanna@pcbfa.ca

p: 780-523-4033

Fairview Office

e: info@pcbfa.ca

p: 780-835-6799

Shelley Henkel

Research Technican Intern

e: shelley@pcbfa.ca

p: 780-978-9088

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