

Forage Facts

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Project Highlight: Cover Crop Agronomy

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Cocktail cover crops are becoming very popular across the Peace Region. This past year alone, PCBFA Staff fielded over 50 inquiries from producers about creating a cover crop mixture, and the agronomy behind growing a successful crop.

What is a cover crop? A cover crop is defined as a multi-species mix of annual grasses, broadleaves and legume species that are seeded to "cover" the soil. This definition fits for our neighbors to the south who have longer growing degree days, and who seed covers after combining to keep a living plant in the soil, which is then terminated prior to seeding the next crop. Up here, we are growing cocktails as a full season crop, with the end use of feed or forage for livestock. Since the

end usage and practice of growing cover crops is different here than those of our neighbors to the south, much research needs to be done to fit our context.

Cocktail cover crops have the potential to provide a number of benefits to our soils and farms. Diverse mixtures promote beneficial plant interactions, increase natural nutrient cycling, improve soil carbon sequestration, and can kick start natural defenses against pests and diseases. These crops can also help to optimize water use and storage, improve forage quality, and increase total feed production.

"Cocktails are a long term investment in your land. Some producers are growing cocktails with the intent to harvest a big crop, but they are also benefiting from all of the ecological services that cocktails provide." says PCBFA's Research Technician Lead, Buthaina Al-Maqtari, "It's hitting two birds with one stone."

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DID YOU KNOW?

We collaborated with Nutrien on our additional acres at the Research Farm? We were happy to collaborate with the Fairview branch to further crops research, and help local community groups!



PCBFA has been conducting research into cover crop mixes since 2014. During the course of this work, we found that more research needed to be conducted into specific areas of crop agronomy, specifically into seeding rates and how these rates affect the end usage of the cover crop.

Producers have also expressed concerns in relation to the increased seed costs, challenges in seeding due to varying seed sizes, and difficulty determining the correct seeding rates for optimum forage production.

In 2018, we applied to the Canadian Agricultural Partnership to investigate the effect of seeding rates on cocktail cover crops and our project entitled 'Multi-species Cover Crop Cocktails in Northwestern Alberta: Agronomic Performance, Ecosystem Services, and Economic Advantages' was approved.

There are three main objectives to this project:

1. Determine seeding rates that optimize forage production, while maintaining a proper diversity of species for maximum ecosystem benefits.
2. Explore the merits of ecosystem services provided by cocktails - for example, nutrient accumulation in the soil and carbon storage - and how they benefit a farming system.
3. Determine the economic advantages of growing cocktail cover crops relative to cereal monocrops.

Our research team hypothesizes that cocktail cover crops can provide an increase in forage production and quality,



as well as increase soil carbon stocks from the atmosphere, which can help us to measure and mitigate agriculture's impact on climate change.

We wrapped up field work for the project this past growing season. If you had attended any tours at our Fairview Research Farm in 2019, or 2020, you would have seen this project in action. This was a large project, with a total of 108 small plots.

We used 7 mixtures and 2 monocultures in this trial:

- CDC Haymaker oats (Control)
- CDC Maverick barley (Control)
- 2 Species Mix: Haymaker oats & Horizon peas
- 3 Species Mix: Haymaker oats, Horizon peas & Winfred forage brassica
- 4 Species Mix: Haymaker oats, Horizon peas, Winfred forage brassica & Phacelia
- 5 Species Mix: Haymaker oats, Hori-

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Seeding Rates Trial



zon peas, Winfred forage brassica, Phacelia & Maverick barley

- 6 Species Mix: Maverick barley, Hairy vetch, Winfred forage brassica, Haymaker oats, Phacelia & Frosty clover
- 7 Species Mix: Haymaker oats, Horizon peas, Winfred forage brassica, Phacelia, Proso millet, Hairy vetch & Vivant forage brassica
- 8 Species Mix: Haymaker oats, Horizon peas, Winfred forage brassica, Phacelia, Italian ryegrass, Crimson clover, Vivant forage brassica & Chicory

These mixtures have varying amounts of cereals, legumes, brassicas and broadleaves to determine if there is any impact on the final forage product.

In addition to the different mixes, three different seeding rates were used as well:

1. Recommended monoculture seeding rate.

(For mixes, each species recommended rate was divided by the number of species in the mix. Example: Barley in a 7 species mix was determined by: 120lbs per acre / 7 species = 17.14 lbs/acre)

2. 125% recommended monoculture seeding rate
3. 150% recommended monoculture seeding rate.

We took a number of measurements from every small plot. Soil health and soil nutrient measurements were taken before seeding and after harvest. These measurements included soil pH, organic matter, soil nutrients, retention of N through the growing season, and organic carbon stock and sequestration rates.

We also measured crop growth and the forage



Our Operations Manager, Chelsey Hostettler and our Chairman Allan McLachlan accepting a cheque for the proceeds from the crop grown on the additional acres at the Research Farm from Randi Kuriga & Derek Heise of Nutrien's Fairview Location. This partnership, made possible by us leasing the additional 250 acres around the Research Farm from the MD of Fairview, has created a new income stream for PCBFA. These funds will be used to further the goals of the association and lessen our dependence on uncertain grants. Emery Beaulieu, a local farmer who helped out with seeding and spraying the crop, chose to donate a share of the proceeds to the Fairview Ski Hill.

produced from every plot. This included taking NDVI readings, legume nodulation counts, plant counts, forage yield using a plot silage harvester, and feed quality.

Akim and Buthaina are currently knee-deep in data from this project, and are very excited to crunch the numbers and get results out to producers. "Over the course of the project, we had an extremely dry spring that led into a wet summer, and a wet spring that led into a dry summer. We are hoping that we can find a trend in the data that

can help funnel down crop species and seeding rates that adapt best to changes in climatic conditions" says Buthaina.

Full results for this project will be available in our 2020 Annual Report, which will be available spring of 2021. If you have any questions about this project, or would like to speak with someone about designing a cocktail blend before ordering seed, please feel free to give us a call at the numbers at the bottom of this page.

Event	Date & Time	Location
Succession Planning Webinar with Joel Bokenfohr	January 14th Noon	Online via Zoom
Peace Country Soil Health Academy with Gabe Brown, Ray Archuleta, Dr. Allen Williams & Shane New	July 14th, 15th & 16th Registration Now Open	NPARA Research Farm, Manning \$1,200/Person \$300 Deposit to Hold Your Spot
<p><i>AHS & Local Guidelines will be followed at in-person events.</i> For More Information & to Register: Visit peacecountrybeef.ca/upcoming-events or Call 780-523-4033</p>		

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