



Grain, Grass & Growth July 2026

Welcome to CARA's Summer Staff!

Gabrial Logan

I was raised on a farm west of Oyen and went to elementary school at Oyen. I have worked at CARA during high school, taken years one and two as a heavy-duty mechanic at Olds College and then moved to Vermillion College. I completed one year of animal science and moved into my first year of crop technology. Taking my practicum here at CARA I hope to finish



my course this next academic year. And hope to advance my knowledge of plants and work on finding what I enjoy working on the most. My future is still up in the air, but I hope to get my class one and sprayer applicator's license and to help my father with farming. The team has changed, and so has some of the work. I am learning a lot more than I did when I worked here in the past.

Quade Smith

I grew up on a ranch north of Cereal for the second half of my childhood, doing lots of horse / cattle jobs along with my dad and have helped on some big operations throughout my life. Since high school I've mostly done



carpentry in the Red Deer/Olds area building custom homes and ag buildings. My interests lie in regenerative ag. I'm trying to learn all I can about different systems, how they all fit together and how eventually that then connects to human health.

Presley Bouvier

My name is Presley Bouvier, I live just outside of Oyen. I am currently going to SAIT in Calgary enrolled in the Legal Assistant program in hopes to become a paralegal. This is my third



summer working at CARA. I have really enjoyed being a part of the CARA team and my favorite part is working in the lab and taking water samples out in the field. During my free time I like to golf quite a bit in the summer. I am excited for another summer at CARA.

Sierra Smolinski

Hi Everyone! My name is Sierra and I'm originally from a farm north of Alsask, SK. In the fall I will be returning to Saskatoon to complete my second year of Animal



Science with a hope of eventually getting into Vet School. Outside of work, I love fishing, playing guitar and taking my horse out for rides. I am so happy to be apart of this wonderful team at CARA.

Jaden Andersen

Hi, my name is Jaden Andersen. I live 35 minutes south of Oyen near Cappon, AB. I go to South Central High School in Oyen and I am going to be in grade 12 in the fall.



I am looking forward to working at CARA for my second year in a row and enjoy doing tasks such as staking or harvesting samples.

CARA Crop Field Day



Tuesday, July 28th - 9:30 am

Grudecki Field Site

SE 27-24-2 W4

East 1 mile on TWP Rd 24-4 from Highway 41

Join CARA for a field walk and discussions on:



Kochia Control in Field Peas Project
Overview

Black Earth humaPost & Liquid Carbon Trial
MASH (Management Alternatives for Soil Health)

Pea & Lentil Variety Trials



Coffee and Lunch Provided with Registration!

RSVP - (403) 664-3777 or cara-3@telus.net





The CARA Soil Health Lab has a dual focus, one of evaluating and monitoring soil health indicators. The second is increasing the understanding of soil health and all the biological, physical and chemical interactions which take place in the soil. The Lab has been designed with dedicated training space to engage producers, youth and others in witnessing biological activities in their soil.

Further to the training function of the CARA Soil Health Lab, Dr. Yamily Zavala, Manager and resident Soil Scientist, has been providing the Canadian Organic Growers (COG) with sessions designed to enhance monitoring of soils amongst their members. In partnership with COG, the following material has been developed to enhance knowledge of soil health.

Soil Microorganisms as the Nutrient Engine: From Biology to Plant Uptake.

COG Webinar Series. March 5, 2026 Yamily Zavala

Session 11: Soil Biology:



The Regenerative Engine of Nutrient Cycling

Session Notes: Biology

Importance of Balance within the Soil Microbial Community

Soils dominated by bacterial activity tend to release nitrogen rapidly, which can sometimes favor weed growth early in the season. In contrast, soils with stronger fungal communities often promote more stable nutrient cycling and improved phosphorus availability, contributing to stronger root systems and overall plant resilience. A diverse microbial community therefore helps regulate nutrient supply, improve soil structure, and enhance the efficiency of nutrient uptake.

The Role of Healthy Soil Biology

Healthy soil biology enables the natural cycling of multiple nutrients, not just nitrogen and phosphorus. Active microbial and fungal communities help mobilize minerals such as sulfur, potassium, zinc, copper, and others, while also contributing to soil aggregation and carbon stability. By supporting soil biological activity, farmers can improve nutrient availability, reduce dependency on external fertilizers, and promote healthier, more resilient cropping systems.

How to Create Supportive Soil Conditions

Improving soil structure, particularly soil aggregation, is one of the most important first steps to building supportive soil conditions for microbiology. Compacted soils limit microbial activity and reduce the soil's ability to retain moisture, both of which restrict biological processes. Increasing plant diversity, such as by planting multi-species cover crop "cocktail" mixes, can help address these issues by introducing a variety of root systems and biomass into the soil. Yamily has observed improvements in soil aggregation within just a few months after introducing diverse cover crops, which in turn creates better conditions for soil microbes and moisture retention.

How to Encourage Biological Nitrogen Cycling

Healthy soil biology depends on both proper conditions and sufficient microbial diversity. In soils where microbial communities are weak or dormant, biological activity can be stimulated through practices such as applying compost extracts or inoculating seeds with biologically-rich materials, including compost produced through systems like the Johnson–Su bioreactor. Crop rotations that include legumes can also support nitrogen cycling by introducing symbiotic nitrogen-fixing bacteria.

Other forms of nitrogen fixation, including free-living nitrogen-fixing microorganisms, may also contribute to soil

fertility, and that maintaining balanced nutrient ratios (i.e. carbon-to-nitrogen and carbon-to-sulfur) can further support microbial processes.

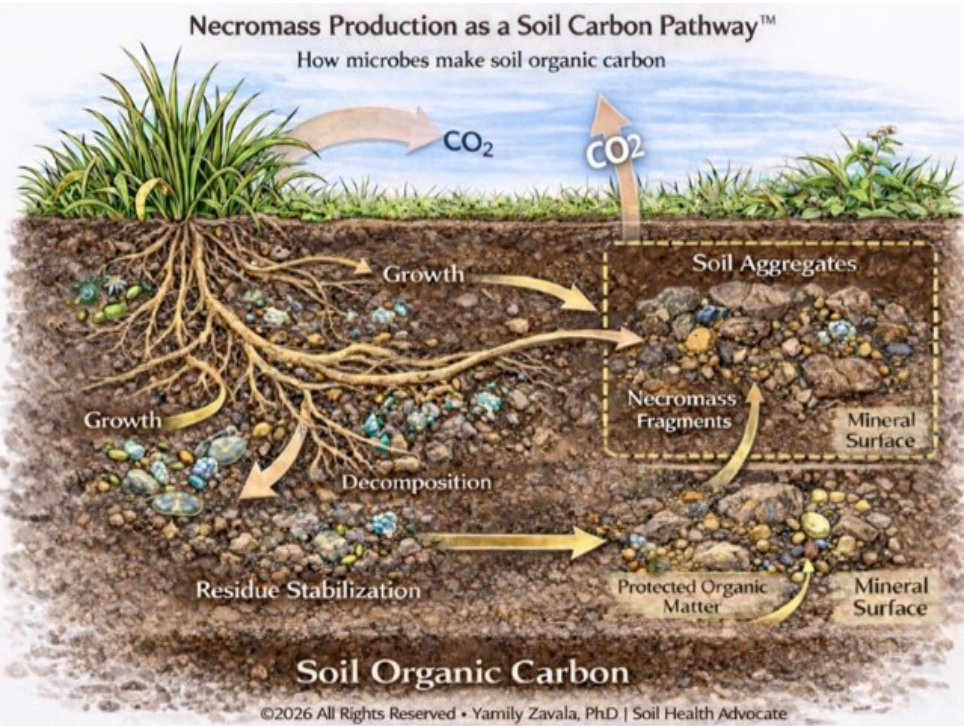
The Relationship Between Bacterial- and Fungal-Dominated Soils

Shifting the balance of soil microbial communities can take time and is unlikely to provide immediate results in a single season. However, there are some examples that demonstrate how incorporating biological management practices into farming systems can gradually transition soils from bacterial-dominated to more fungal-dominated systems over several growing seasons. It is important to undertake soil benchmarking and monitoring so that farmers can track how biological communities respond to management practices in their specific local conditions.

The Role of Soil Microbes in Carbon Cycling

Plants capture carbon dioxide from the atmosphere and transfer carbon into the soil through root exudates. Soil microorganisms consume these carbon compounds, and when microbial cells die, their remains (AKA microbial necromass) become stabilized within soil aggregates.

This process contributes significantly to long-term soil carbon storage and helps build stable soil structure. Microbial processes also produce a range of secondary metabolites, including compounds with antimicrobial properties that can help regulate soil ecosystems and support plant health.



This image shows how microbes convert plant carbon into soil organic carbon through the formation of necromass (dead microbial material). Plant roots feed soil microbes with carbon compounds, microbes grow and decompose organic residues, and their remains become stabilized inside soil aggregates and on mineral surfaces. This protected carbon can persist in the soil, improving structure, fertility, and long term carbon storage.

Necromass Fragmentation

Microbial cell walls break apart into smaller fragments. These fragments contain complex organic compounds such as amino sugars and peptidoglycan. Fungi is the bridge between roots and allows for nutrient exchange. This process switches diverse plants from antagonistic to synergistic.

Plant Diversity Boost Nutrient Exchange

There are great benefits of plant diversity in facilitating nutrient exchange within the soil ecosystem. Legumes fix nitrogen through symbiotic bacteria in root nodules, while other microbes solubilize nutrients like phosphorus. Mycorrhizal fungi form

networks that connect plant roots and help transport nutrients across the soil. These interconnected relationships allow nutrients to move between plants and microorganisms, reducing nutrient deficiencies and supporting stronger plant growth compared with monoculture systems.

Green manures Build Soil Organic Matter

Incorporating green manure introduces additional organic material that soil microorganisms can decompose, thereby stimulating biological activity. As microbes process this material and reproduce, their dead cells contribute to the formation of microbial necromass, which can stabilize carbon in the soil, particularly when fungal communities are present to help form and stabilize soil aggregates. However, successful carbon stabilization depends on a balanced and active soil ecosystem; without sufficient microbial and fungal activity, much of the added organic matter may simply be lost through respiration rather than being stored in the soil.

Shorty Fensky Case Study

Yamily shared an example from a farmer who grazed cattle on a diverse cover crop mix, highlighting the significant benefits observed in livestock performance. After beginning to graze the cover crop in mid-August, the farmer reported exceptionally strong weight gains in both cows and calves. In fact, the calves were sold about two months earlier than usual yet still weighed roughly 100 pounds more than calves from the previous year. This kind of improvement represents a major economic benefit and illustrates the value that diverse cover crops can provide within integrated crop–livestock systems.

Due to personal circumstances, the farmer did not plant a crop the next year, and the field became almost entirely covered in clover with very few weeds present. This outcome may have been related to a high fungal-to-bacterial ratio in the soil. In fungal-dominated systems, nitrogen tends to be immobilized within fungal biomass and released more slowly, which can reduce the availability of mineralized nitrogen in the soil. Because clover can fix its own nitrogen through symbiotic bacteria in its root nodules, it was able to thrive under these conditions while other plants that rely on available soil nitrogen struggled to compete. As the clover dominated vegetation decomposed, nutrient cycling accelerated and bacterial populations increased, which lowered the fungal-to-bacterial ratio at the end of the growing season. This demonstrated that soil microbial communities are dynamic rather than static. Their balance shifts depend on factors such as crop species, carbon inputs, seasonal conditions, and management practices. Spring samples often reflect the biological legacy of previous management, while fall samples provide insight into the current processes taking place in the soil.

Why Monitor?

There is great importance of long-term monitoring to understand how soil systems respond to management changes. Soil samples from Shorty’s field had been collected from the same GPS locations over several years, allowing trends in microbial communities to be tracked over time. Additional measurements (i.e. aggregate stability) could provide further insight into how soil structure evolves alongside biological changes.

Conclusion

Plant diversity can quickly stimulate biological activity and improve soil structure. In one example, a simple cover crop mixture grown for just over two months produced visible improvements in soil aggregation compared with a nearby harvested lentil field that had bare, compacted soil. The cocktail cover crop created root systems and organic inputs that supported microbial activity and initiated the formation of soil aggregates. For Yamily, the development of soil aggregates is one of the earliest and most visible indicators that soil health is improving.



The images show roots surrounded by newly formed soil aggregates and compare the planted area with adjacent bare soil. In a short time, the living roots activated the rhizosphere, helping begin soil aggregate formation and visibly improving the soil surface structure.

A huge shout out of thanks to Gould Ranching for hosting another very successful Farm Safety Camp at their Bin Yard in Special Area 4 on June 5th



Generous donations of time and resources resulted in delivery of safety messages to over 140 elementary students from Altario, Consort, Veteran and New Brigden schools. In addition to hosting, Goulds supplied machinery as well as the barbeque lunch which everyone enjoyed. Presentations were provided on the following topic areas: large and small equipment, grain, animals, farm chemicals, fire and ambulance. New stations for this year included the dangers of fuel sources, post hole auger, manure spreader and Home Alone. Thanks as well to the following for their support of the day: Neutral Hills Ag Society, Murray and Elaine Sankey, Consort UFA Farm Supply, Special Area 4, Westview Coop, Webbs Machinery, Consort Fire Department, County of Paintearth Ambulance, Compass Sign and Safety and Battle River Watershed Alliance.

A second Safety Camp will be delivered to elementary students in the southern schools of the Special Areas and MD of Acadia in late September or early October. Lanfine Wind, channeled through the Community Foundation of South Eastern Alberta, will be supporting the Camp through a grant. More information on this event will be shared later.



CARA's Program Highlights

The wonderful moisture conditions have most sites and trials off to a really good start this growing season. Kudos to Braeden, Karin, Jerry, Renae and the Summer Crew for getting all sites seeded in good time. Staking (labelling) for self-guided tours should



be completed within the next week or so. Be sure to join our Crop Field Day July 28 at our Grudecki site. Please call for directions to the other sites (Williams (SA 2), Smigelski (SA 3) and Redel (SA 4)) as well.

In addition to the provincial regional variety trials (RVT's), we have **added field pea and lentils to our group of local variety trials**. These trials include varieties based on what is popular for local producers as well as newer cultivars which look promising. We don't have the opportunity to select entries in the provincial trials as they depend on seed grower decisions and there is a limit to the number of years any single variety can be in the trials. The pulse trials were planted at our Redel (Special Area 4) and Grudecki (MD of Acadia) trial locations. We now have 4 sites of our local cereal variety trials as well.

CARA partnered with Black Earth to **evaluate a humalite compost product** at 2 sites in the Special Areas as well as 2 more in the Battle River Group region. Various rates of the granular compost and a liquid extract in yellow peas are under evaluation.

2026 will be the final year of the **kochia control project**. CARA has partnered with BRRG to monitor the impact of several herbicides on controlling kochia in yellow peas. Six site years of data will be compiled into the final report before the end of the year.

Water quality monitoring tools are being evaluated for accuracy on 4 ranches during the summer. Results from the monitoring devices will be compared to lab analysis of the same parameters. If the tools prove to be accurate, the ability to measure critical quality levels on-site, in real time, could save ranchers thousands of dollars as well as reduce the stresses related to water supply.

Anchor J Ranches donation to CARA's 2026 program has been applied to virtual fencing technology, evaluating the correlation between mineral levels, water quality and conception in beef cattle as well as the basics of a micro-biology project.

Cow-calf pairs and yearlings at locations north of Cereal and near Veteran will be wearing Gallagher's eShepherd collars in **demonstrations of virtual fencing** later this summer. The use of this technology to restrain movement of cattle, as well as to target grazing distribution and forage utilization, will be monitored.

The **influence of mineral levels on conception rates** will be monitored in local beef herds. Soil, feed and water samples will be analyzed to determine mineral levels in 2 grazing systems. Fall pregnancy checks along with sampling for blood mineral levels will be carried out in the fall.

Dr. Yamily Zavala is initiating a study of **the influence of certain soil microbial communities on nutrient availability**. Results may help develop strategies for reducing chemical fertilizer use.

42 participants joined certified arborist Toso Bozic as he led discussion and demonstrated various techniques for establishing and **managing shelter belts and fruit trees**, including pruning and grafting, at Kirby and Renae Laughlin's near Big Stone on May 13.





SOIL HEALTH SUMMER TOUR

WITH JOEL WILLIAMS

BUILDING SOIL HEALTH: PUTTING PLANTS INTO ACTION

Create your farm’s customized soil health plan based on lab results, including the importance of chemical parameters and soil mineral ratios. Understand the roles of plants in building organic matter, nutrient cycling, reducing salinity, controlling erosion, and improving microbial activity.

FEATURING: DR. YAMILY ZAVALA, CARASHL MANAGER

A review of sampling for soil health including benchmark sampling, monitoring, and implementing MASH (Management Alternatives for Soil Health). Learn how biological activity is measured, when and why biostimulants should be applied, and the use of biological amendments such as Johnson-Su Bioreactor, compost tea, & liquefactions.

FRIDAY JULY 24, 2026
9:30AM - 2:30PM
CARA SOIL HEALTH LAB

CARA Member: \$30 / Non-Member: \$40
To register, visit: <https://chinookappliedresearch.ca/events>





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