



Drone Spraying Clinic



Grain, Grass & Growth April 2024

March Extension Report

At the beginning of the month CARA was invited to the Palliser Grazing Club's Winter Workshop in Rumsey as a guest in the tradeshow providing the producers with resources for available grants, soil health monitoring through the CARASHLab, and information on upcoming events.

CARA had three of our own Grazing Clubs in March including meetings in Consort, Pollockville, and Spondin. The GC theme for March was

"Business", some of the information shared at the meetings included succession planning tips and "Ranch Banking 101" from FCC, bull valuation data from the Beef Cattle Research Council, Society of Range Management's "Good Grazing Makes Cent\$" program, forage and winter cereal funding programs through Duck's Unlimited, and a virtual

presentation on how rotational grazing can increase a ranches profitability brought to us by the University of South Dakota.

March 6th marked the Ladies Cow Boss Clinic with over 60 ranching



60 women enjoying the Ladies Cow Boss Clinic

women taking in information on teat and bag scoring, reducing antibiotic resistance, understanding of EPD's, feed efficiency tips, and participating in the hands-on skill stations including feed testing, sub-q and IM injections, and placing hormone implants

in frozen, post-mortem cow ears provided by Cattle Health Management from Brooks.

CARA hosted 5 online webinars throughout the month including a 3-part series on kochia including biological background on why this undesirable weed has become so prolific recently presented by Special Area #2 and County of

Vulcan Ag Fieldman Jesse Williams and Deanna Heather. NuFarm rep, Jason Lindgreen shared great integrated pest management tips on controlling kochia such as using chemical controls effectively by rotating chemical groups and modes of action and using different agronomic practices to help control kochia such as increasing seeding rates or seeding winter cereals for early crop competition. The 3rd "Lunch'n'Learn" kochia webinar was presented by Adrienne Good

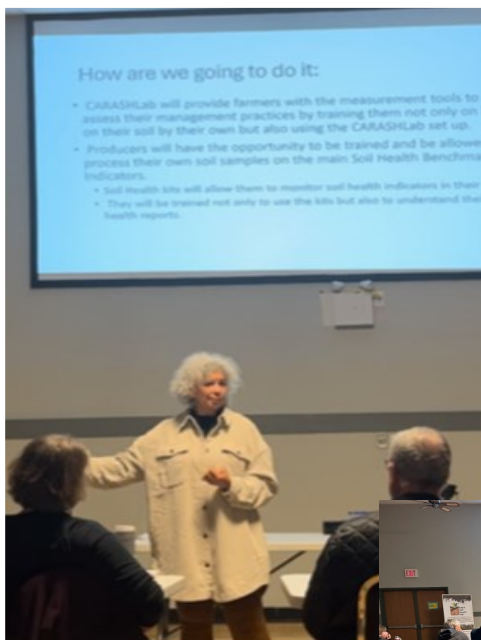


Hands-on skill stations at the Ladies Cow Boss Clinic

from the Saskatchewan Ministry of Agriculture who gave producers

some important harvesting tips and nutrition considerations for utilizing kochia as a stored feed.

CARA hosted two more webinars for “Spring Crop Planning” including a presentation from Dr. Rigas Karamanos on nitrogen fertilizer considerations in the Brown Soil Zone and Gov. of AB’s Provincial Crop market Analyst, Neil Blue, sharing information on the Spring 2024 cereal and pulse markets.



The 2024 Annual Soil Health Mini Conference: “Change to Help Our Soils” was held at the Oyen Seniors Centre with discussions on the roles of soil microbiology, considerations with intercrops and cover crops, producer sharing on-farm soil health management practices, and how the MASH (Management Alternatives for Soil Health) initiative through the CARASHLab will be putting sampling and lab techniques in the hands of producers for better monitoring and decision-making concerning soil health.



CARA’s Dr. Yamily Zavala presenting at 2024 Soil Health Mini Conference



On March 18th and 19th Landview Drones partnered with CARA to deliver a drone school for uses in agricultural spraying that was well attended including producers from outside of the Special Areas.

Other events hosted in March included an Environmental Farm Plan Workshop in Pollockville, a Shelterbelt Workshop held at the Youngstown School Greenhouse, and attending the Oyen SCHS’s Return to Rural Career Fair.



Producers at the Lakeview Drone Ag Spray Clinic

In between workshops, meetings, and webinars, producers have been stopping by the CARA Office to for in completing applications with accredited BMP approval for different grants currently available including the On-Farm Climate Action Fund, Resilient Agricultural Landscape Program and the Water Program.

CARA would like to extend a thank you to everyone who made time to participate in one or more event over the last couple months. If you have suggestions for events or speakers in the future, please reach out to Karin Roen, CARA Program Agronomist and Extension Coordinator by calling (403) 664-3777 or emailing cara-3@telus.net.

www.chinookappliedresearch.ca

DID YOU KNOW?



The Kochia Control “Lunch’n’Learn” Series and the “Spring Crop Planning” webinars were recorded and can be viewed at anytime on the CARA website? You will also find recordings of the April 2023 “Gopher Control Webinar Series”!



Tip: open the camera app on your cell phone and hover the camera overtop of the QR Code above. Click on website link that comes up to open the webpage on your phone’s internet browser.

Herbicide Resistant Kochia: Outlook and Considerations

by Braeden Peers, Program Agronomist

In the most recent provincial survey, Geddes et al. (2023) found that at 78% of sites tested, the kochia populations in Southern Alberta conferred glyphosate resistance. This proportion is up from 50% resistant in the previous survey undertaken in 2017 (Beckie et.al, 2019). On top of the alarming rate of glyphosate resistance that Dr. Geddes has documented, resistance to the Group 4 herbicides dicamba and fluroxypyr is on the rise as well, occupying 44% and 28% of the sites in the 2021 survey (Geddes et al., 2023). It was assumed in this study that all populations are group 2 resistant and when testing for multiple resistances it was found that 45% of the populations that were sampled were resistant to at least 3 herbicides (Geddes et al., 2023). These results suggest that producers in Southern Alberta are putting greater and greater selection pressure on current populations by the continual use of these herbicides and that resistance is likely to continue to spread if the use patterns do not change.

The main driver of resistance is selection.

Spraying a herbicide onto a weed population is an example of selection. If there is repeated use of a herbicide, glyphosate for example, each application selects for those individuals that have resistance to that herbicide. The more selection events that occur, the faster the population becomes resistant.

One strategy to combat the buildup of resistance is to tank mix multiple herbicide groups. The idea being that an individual that is resistant to one herbicide is likely not resistant to the other, increasing the rate of control and decreasing the spread of the resistance genes. In the case of kochia, this strategy is losing efficacy as multiple herbicide resistances have built up in many of the populations. Meaning that a tank mixture including glyphosate, a group 2 herbicide and fluroxypyr or dicamba will have little effect on 45% of the populations tested in the 2021 survey. Rotating herbicides to include chemistries from groups 6, 27, and 14 may provide some assistance in slowing the spread of resistance, but as these groups increase in use, the risk of resistance also

increases.

Proper herbicide stewardship will become increasingly important moving forward. Many “new” herbicides that are brought to market today are using old chemistries and are often combinations of the same herbicides groups that have been on the market for years. This means that these new products may work for a time, but are not reducing the spread of resistance. Knowing the herbicide groups available and creating a herbicide rotation plan to avoid multiple applications will be key to slowing the spread of glyphosate, dicamba, and fluroxypyr resistance, as well as all other herbicides used today.

Charles M. Geddes, Mattea M. Pittman, Linda M. Hall, A. Keith Topinka, Shaun M. Sharpe, Julia Y. Leeson, and Hugh J. Beckie. 2023. Increasing frequency of multiple herbicide-resistant kochia (*Bassia scoparia*) in Alberta. *Canadian Journal of Plant Science*. **103**(2): 233-237. <https://doi.org/10.1139/cjps-2022-0224>

Hugh J. Beckie, Linda M. Hall, Scott W. Shirriff, Elise Martin, and Julia Y. Leeson. 2019. Triple-resistant kochia [*Kochia scoparia* (L.) Schrad.] in Alberta. *Canadian Journal of Plant Science*. **99**(2): 281-285. <https://doi.org/10.1139/cjps-2018-0256>



Alberta Soil Health Benchmark project underway

This article is taken from the April 3, 2024 Top Crop Manager Magazine

Project to assist in assessing, interpreting and understanding soil health status and management responses in Alberta.

by Bruce Barker

Soil health is at the foundation of sustainable agricultural production. Yet despite the importance of soil health to farmers and consumers, few methods exist to measure soil health or to have a baseline for measuring improvement or degradation of soil health on a regional basis. A research project in Alberta is working to develop a better understanding of soil health and develop a provincial database of physical, biological, and chemical soil health indicators.

“The project was developed because there was a lack of information on soil physical and biological functionality. To assess the soil health status, physical and biological indicators need to be measured along with soil chemical (fertility) properties. Soil fertility had been the primary focus for soil evaluations in the past,” says Dr. Yamily Zavala, Soil Health and Crop Management Specialist with Chinook Applied Research at Oyen, AB. “Soil biology plays a crucial role in improving soil health and healing the soil. The process is not well understood, however, even though the role in improving soil physical and chemical functionality has been well documented.”

Zavala says that evaluation of biological soil characteristics has been available but only used as a tool for soil health during the past few years in laboratories in the United States and more recently eastern Canada. Existing biological and physical tests have not been evaluated and monitored specifically for

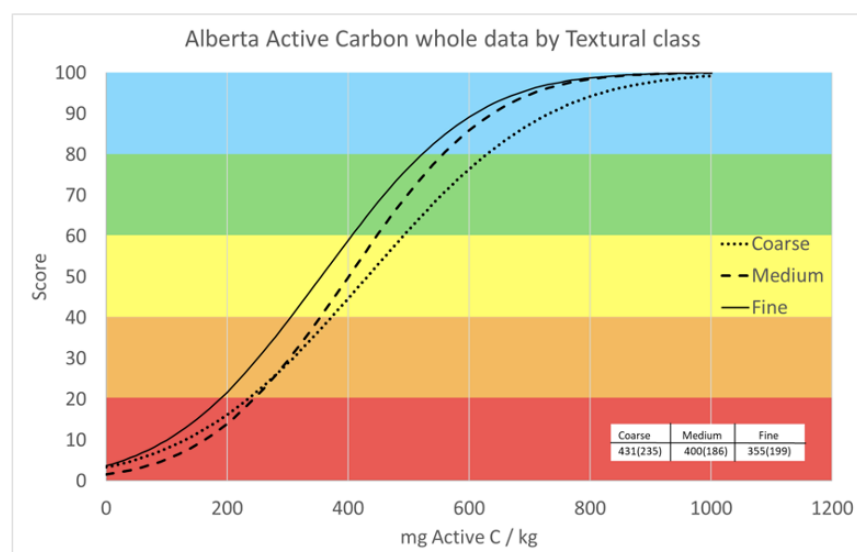
Alberta soils. To fill in that gap, CARA led a five-year Soil Health Benchmark evaluation project in Alberta from 2018 to 2022. The study was funded by the Canada Agriculture Partnership (CAP) program.

The objectives of this study included: 1) to evaluate soil health indicators focusing not only on the chemical (complete soil fertility) soil properties but also soil physical and biological constraints, and 2) to create a soil health benchmark database to develop provincial and regional Scoring Functions for assessing, interpreting, monitoring and understanding soil health status and management responses.

Twenty soil samples for a minimum of 220 sites per year were collected by 11 of Alberta’s 12 Alberta’s Applied Research and Forage Associations (ARAs). At each location, a composite soil sample (6 to 8 cores) was collected using a two inches diameter pipe sleeve. The depth of the sampling was done based on the compaction layer found during the infield sampling measurements. If the 300 PSI

compaction layer was within the top six inches of the soil, samples for that site were collected at two depths of 0-3 inches and 3-6 inches. Otherwise, samples were collected at 0-6 inch depth.

At the CARA Soil Health Lab (CARASHLab), samples were analyzed for biological and physical properties. Biological evaluations included active carbon, soil microbial respiration and total fungal and bacteria biomass, nematode and protozoa functional groups as part of the Soil food Web. Physical properties were measured both in the field (soil compaction and water infiltration) and at CARASHLab (soil texture and wet aggregate stability). Chemical/soil fertility measurements like macro and micronutrients, pH, EC, cation exchange capacity and organic matter, were



analyzed by a commercial lab. Total carbon, organic carbon and total nitrogen were evaluated at the University of Alberta.

“Understanding the role of biology and physical soil parameters is linked to an increasing interest in soil health, plant health and ultimately food quality. There is also concern with carbon both in the air and the soil. Since carbon and soil health are very closely connected, management practices improving soil health to regenerate the agricultural system will also improve carbon sequestration” explains Zavala.

Soil Health reports were initially generated using the Cornell Comprehensive Assessment of Soil Health (CASH) framework. Statistical analysis was used for the Soil Management Assessment Framework (SMAF/

Data generated for each site sampled has been assembled into Soil Health Benchmark (SHBenchmark) comprehensive reports. The reports capture a picture of the soil health status and it is a point of reference for comparison to future monitoring and management changes. Soil scoring curves provide an indication of whether the measurement is an area of concern or constraint for over-all soil productivity. Suggestions for mitigation or improvement of soil specific condition are also provided.

Zavala says that the soil health benchmark report is like a score card of baseline information which can be compared to future soil assessments and to monitor progress towards changing soil health constraints. She says that Dr. Derek Mackenzie at the University of Alberta has approached her to find a way for the Alberta Soil Health Benchmark information to be used in the development of an App for soil health assessments.

Submission N / Land Location	Farmer Id No.	Sample No.	Depth (cm)	% Sand	% Silt	% Clay	Textural Class
SE 6-16-W3	CL 2228	5626	0-15	84	11	5	Coarse Sandy loam

Soil Health Analysis: Biophysical & Others			Constraint(s)
Indicator	Results	Score	
Physical			
Wet Aggregate Stability (%)	69	89	
Water Infiltration (min)	2	100	
Bulk Density (g/cm ³)	0.87	100	
Compaction Depth/cm (200psi)	6	81	Compaction, surface rooting, water infiltration, water storage, erosion
Compaction Depth/cm (300psi)	15	1	Deep rooting, surface crusting, water availability, nutrient uptake, plant growth and yield, erosion, deep compaction, restrictive layer
Mean Physical Health:	60	60	
Biological			
Organic Matter (%)	5.7	100	
Active Carbon (ppm)	415	41	
C:N Ratio	11	99	
Microbial Respiration (mg CO ₂ /g)	1.89	100	
Mean Biological Health:	85	85	
Chemical			
pH	6.5	100	
Soluble Salts (EC)	0.14	96	
Extractable P (ppm)	46	76	
Extractable K (ppm)	332	4	K High
Magnesium (ppm)	174	1	
Iron (ppm)	51	4	Excessive Fe
Manganese (ppm)	64	1	Excessive Mn
Zinc (ppm)	7.8	1	
Other cations Rating (0-4)	2	2	
Mean Chemical Health:	57	57	
Overall Soil Health Score:	67	67	Medium

Soil Scores are Color coded

Soil Constraints

Warning

Soil Health Report

“Understanding soil health will give Alberta producers a valuable tool for use in making strategic management decisions on their farms and ranches. The assessments will identify soil health constraints which in turn gives producers targets for deciding appropriate management practices,” says Zavala. “Our Lab is very unique and we are calling it The Farmers’ Lab. Anyone can come and even assess their soils and plants samples with us. Another reason why it is a Farmers’ Lab is because more than 80 per cent of the initial Lab instruments and materials were purchased or acquired by donations from producers and Industry.”

Going forward, CARA has initiated a Verification of Management Project with all partners from the initial Benchmark Study to monitor changes in soil health indicators three years from the initial sampling at sites across the province. Eventually, a database linking management practices to

CASH) to develop preliminary scoring functions for the Alberta Soil Health Benchmark.

“Alberta’s Soil Health Framework Tool uses these Score Functions to assess and monitor soil health constraints, and to adjust soil health changes resulting from applied targeting managements,” says Zavala.

Source: Zavala et al. 2022.

improvements in soil health constraints will be developed which can provide a quick reference for recommended agronomic practices for specific sites.

PHOTOS

WTCM14.5 soil cores.JPG

Alberta Soil Health Benchmark project is developing a way to measure and improve soil health

Photo by Bruce Barker

The Ferruginous Hawk

The ferruginous hawk (*Buteo regalis*) is Alberta's largest hawk with a wingspan of roughly 55 inches.

They get their name from the rusty coloured feathers on their legs and upperparts (ferruginous= rusty or iron). These hawks prefer large tracts of native grassland and nest in trees, on cliffs, and occasionally on the ground.

Ferruginous hawks migrate back to Alberta usually by mid

March to early April and pair up for the breeding season. Nests are usually very large, and the hawks incorporate into the nest things such as sticks, grass, tumbleweeds, cow dung, sagebrush, bale twine, bones, etc. to make their nests. Incubation is usually just over a month long and the females remain on their eggs even during harsh spring snowstorms. Once the young are born, the males start bringing lots of food to the growing young. The main food source for ferruginous hawks is Richardson's ground squirrels (commonly known as gophers) and a family of ferruginous hawks can consume roughly 500 ground squirrels during the breeding season. By mid June the downy feathers on the young birds begin being replaced with flight and body feathers and usually by mid to late July the young have fledged from the nest.

The ferruginous hawk is considered both at risk and endangered in Alberta. The estimated number of hawks in Alberta is roughly around 1,400 pairs. Their population is greatly impacted by the loss of native grasslands and disturbance to nesting sites. The current Alberta Ferruginous Hawk Recovery Plan was released in early 2024. To learn more about the actions being taken to aid this species, visit the following link: <https://open.alberta.ca/publications/alberta-ferruginous-hawk-recovery-plan>.

Things you can do to promote and keep ferruginous hawks in your area:



Maintain existing native grasslands and pasture lands. Maintain woody areas, especially lone trees. You can put fencing around trees to protect them from cattle rubbing but still allow the cattle to utilize shade from the tree. If you find nesting ferruginous hawks on your property, try

not to disturb them as they are sensitive to disturbance.

Let the hawks do their job. As mentioned, the main food source for ferruginous hawks is Richardson's ground squirrels. Poisoning ground squirrels can also kill other wildlife that eat them, including ferruginous hawks.

Restrict or limit grazing in woody and riparian areas.

Follow government setback distances.

Welcome these hawks on your land and remember, a family of ferruginous hawks will help control your gopher population naturally. If you want to chat about ferruginous hawks or other species at risk, contact the MULTISAR program at info@albertapcf.org or visit <https://multisar.ca/> for more information.



Strategies for Managing Cattle Through Drought

by Dianne Westerlund, Manager & Forage Agronomist

The Beef Cattle Research Council has a huge library of information related to all aspects of the beef industry. In addition to on-line fact sheets and calculators, BCRC has hosted a number of podcasts and webinars. The following notes are excerpts from a Webinar released last fall which features presentations from Dr. John Campbell, Instructor and Researcher at the University of Saskatchewan and Jesse Williams, Whiskey Creek Ranch near Hanna. Jesse is also Ag Fieldman of Special Area, so is speaking from experience when it comes to drought conditions.

Veterinarian Dr. John Campbell began the webinar with a discussion of health problems commonly associated with drought:

Vitamin A and E Deficiencies – These vitamins are stored in the liver for only a few months, so many cows become deficient in late winter even with good quality feed. The deficiency can also be a problem during the grazing season when new grass growth is limited by drought conditions. Deficiencies can result in weak calves with low immunity or retained placentas in the cows. Because these nutrients are passed to the calves through colostrum, be sure to check the levels in your mineral supplements to ensure the cows are getting enough at calving time. Vitamin injections may be necessary. If pastures are dry again during this grazing season, consider providing mineral supplements all summer long.

Nitrate Toxicity – Nitrate issues are more of a concern with stressed annual crops such as triticale, rye, wheat or barley but can also accumulate in kochia and Bull, Canada and Russian thistles. It is not generally a problem during the early part of the grazing season but is something to watch for if cattle are turned into crops after heading or forced to consume kochia or the thistles.

Copper Deficiency – Copper deficiency is the most common deficiency in beef cows throughout much of the southern prairies. Symptoms include rough or bleached hair coats as well as impaired reproductive performance (eg. lower pregnancy rates) and immunity. Again, copper supplementation through minerals and/or salt is recommended year round for cattle.

Low Body Condition Scores – Thin cows typically milk less and take longer to cycle and breed back. Strategically planned grazing and/or supplementation with good quality feeds, especially under drought conditions, may be important.

Joining Dr. Campbell in the webinar was Jesse Williams of Whiskey Creek Ranch, Hanna. Jesse focused on strategies for culling, optimizing cattle feeding and creative drought management planning. Jesse highlighted several management considerations which are always important, but can help ease some of the pressures our drought conditions have caused.


Planned Culling – Remove the under-performers or problem

cows from your herd. Keep good records so you know where your herd's strengths lie and focus your feed and grazing resources on them.

Monitor Feed and Water Quality – Know the quality of your stored feed and grazing to plan for the most efficient use of your feed resources. Watch water quality during the grazing season as it can drop quickly during drought conditions. Keep an eye out for poisonous plants which often grow in the riparian areas which cattle often turn to in dry pastures. Imported feeds can be a critical part of the annual feed supply, but can also bring invasive weeds so be careful you are not creating a serious future problem. If you plan to take advantage of harvesting feed from ditches, take a scan on what species are there, as well as what garbage you might be picking up.


Grazing Strategies – Assess, plan early, have a solid back-up and back-up to the back-up plan. Honestly assess the condition of your grazing resources early in the season and plan out how to best use them (timing, stocking rate and duration). After extended dry conditions some pasture may need a much longer rest than others. Also, keep in mind the rule of thumb that grazing 1 day too early in the spring reduces your fall grazing by 3 days. Maintaining litter or thatch improves retention of the precipitation we do get.

Check out the BCRC Website for more great information on managing through a drought. <https://www.beefresearch.ca>




CARA
Soil Health
Lab

MASH 2024
Highlight Presentation:
Johnson-Su Bioreactor



CARA
CANADIAN APPLIED RESEARCH ASSOCIATION

LEARN THE WHAT, WHY, AND HOW TO CREATE
YOUR OWN ON-FARM COMPOST BIOREACTOR FOR
IMPROVING YOUR SOIL HEALTH WITH CREATORS
DR. DAVID JOHNSON AND HUICHUN SU



"The Johnson-Su composting method creates compost teeming with microorganisms that improve soil health and plant growth and increase the soil's potential to sequester carbon. This simple composting method produces a biologically enhanced compost by creating an environment where beneficial soil microorganisms can thrive and multiply. When this biologically alive compost is applied to the soil the microorganisms inoculate the soil and work in harmony with growing plants to improve soil health and increase the amount of carbon drawn out of the atmosphere and into the soil."
(Regeneration International)

JUNE 26, 2024—Oyen, Alberta

Contact 403-664-3777 or cara-3@telus.net for more information!





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